

Abstracts - 57th ESCVS

April 25th, 2008 2nd Congress Day 14:30-16:00 1st Cardiac Scientific Session - Coronary 1

C1-1

IS MECC THE BEST APPROACH FOR CABG?

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Objectives: CABG under cardio-pulmonary bypass (CPB) is a common and successful procedure, but not free of risks. New techniques, such as the minimal extracorporeal circulation method (MECC), have been developed to minimize these risks. We present our experience with MECC for CABG and compare MECC with standard CPB.

Methods: The study includes 300 consecutive CABG patients operated on in our institution. We used standard CPB for the first 150 patients (the SCPB group) and MECC for the following 150. Both groups were similar in terms of patient age, gender, number and type of coronary lesions, indications for surgery, types of angina, number of previous myocardial infarcts, and risk factors.

Results: Hospital mortality was 3% in the SCPB group and 0% in the MECC group ($P<0.03$). Peri-operative infarcts were 8% with standard CPB and 2.6% with MECC ($P<0.02$). Incidence of atrial fibrillation was 14 in the standard CPB group and 12 in the MECC group (p ns). Postoperative cardiac troponin-I was lower in the MECC group ($P<0.005$). Postoperatively, SCPB patients bled more and required more transfused blood ($P<0.003$). On entry into the intensive care unit, MECC patients had fewer leukocytes ($P<0.001$) and more platelets ($P<0.001$) than SCPB patients. Duration of mechanical ventilation, time in the intensive care unit, and duration of hospitalization were shorter in the MECC group ($P<0.002$, $P<0.001$ and $P<0.01$, respectively).

Conclusions: Both standard CPB and MECC give good results. However, in our experience. The majority of the pernicious effects (e.g. inflammatory response) resulting from standard CPB are minimized with MECC. The rates of mortality and preoperative infarcts are significant lovers with MECC technique than SCPB. Therefore, to prove the superiority of MECC would require a larger and randomized study.

C1-2

MINIMAL EXTRACORPOREAL CIRCULATION AND OFF-PUMP COMPARED TO CONVENTIONAL CARDIOPULMONARY BYPASS IN CORONARY SURGERY

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Objectives: Cardiac surgery offers three options to perform coronary artery bypass grafting (CABG), conventional cardiopulmonary bypass (CCPB), minimal extracorporeal circulation (MECC) and off-pump coronary artery bypass (OPCAB). At present advantages of each technique are under discussion. In recent publications patency rates of OPCAB are inferior to those of CABG performed with cardiac arrest.

Methods: We investigated 1472 coronary operations, 1143 using CCPB, 220 were performed using MECC and 109 using the OPCAB technique. All patients were recorded prospectively. Perioperative follow-up was focused in the occurrence of arrhythmia, neurocognitive outcome and the need of blood and blood products.

Results: Operative mortality was comparable in all groups. The mean number of bypass grafts reached an average of 3.2 ± 0.6 in the MECC group, 3.4 ± 0.7 in the CCPB group and 1.9 ± 0.8 in the OPCAB group ($P<0.01$). Arrhythmia occurred

in 24.8% in the MECC group, 35.6% in the CCPB group ($P<0.05$) and 21.7% in the OPCAB group. Neurocognitive disorders occurred in eight patients (3.6%) of the MECC group, 74 patients (6.5%) of the CCPB group ($P<0.05$) and in three patients (2.8%) of the OPCAB group. The median number of blood transfusions per patient was 0.8 in the MECC group, 1.8 in the CCPB group and 0.8 in the OPCAB group ($P<0.0001$).

Conclusions: Perioperative morbidity of the MECC and OPCAB technique is comparable and less compared to CCPB. The MECC technique allows coronary surgery with cardiac arrest. The benefits of longer patency rates and completeness of revascularizations favours MECC over OPCAB.

C1-3

TOTAL LAD AREA REVASCULARIZATION USING AUTO LITA Y-GRAFT ITSELF; 3-YEAR FOLLOW-UP RESULTS

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Objectives: Internal thoracic artery (LITA) has been selected as a best graft conduit for left anterior descending (LAD) area. However, distal part of LITA is usually discarded because of its small size and another reasons. There was little information about distal part of LITA as a graft conduit, so we tried to investigate the efficacy of the distal LITA in coronary artery bypass graft.

Methods: From July 2003 to August 2004, 20 consecutive patients (17 male, 3 female) who required total LAD area revascularization underwent coronary artery bypass graft using LITA Y-graft itself. They were included 8 cases of 3 vessel disease, 6 cases of left main disease, 4 cases and 2 cases of 2 vessel disease and single vessel disease, respectively. Mean age was 62.8 ± 8.3 -year-old and number of diseased vessels were 2.6 ± 0.9 . OPCAB was performed in 18 cases and the other two cases underwent on-pump beating CABG. LITA harvesting was performed all semi-skeletonized manner. Initially we measured the distant to the target point on LAD, then cut off the LITA graft and made of Y-shape graft. After the LAD anastomosis, we performed diagonal branch anastomosis using another hand of Y-graft while kept LAD perfusion. Mean operation time was 295 ± 45 min. Intraoperative mean LAD and diagonal flow was 27.2 ± 16.0 and 15 ± 8.9 ml/s, respectively.

Results: Postoperative angiography was performed mean 37 months after surgery. There were no in-hospital mortality and no serious complication. Superficial wound infection occurred in three cases and acute renal failure developed in one case which recovered soon after. Three-year follow-up results were excellent. All patients have been alive and had patent graft in LAD area. Two cases of RCA stenting was performed during follow-up periods.

Conclusions: In the selective cases, LAD and diagonal revascularization with LITA auto Y-graft is technically feasible and may reduce the requirement of another grafts. Moreover, graft flow limitation resulting from diamond shape anastomosis in sequential anastomosis using radial artery can be avoided.

C1-4

MULTI VESSEL OFF-PUMP MYOCARDIAL REVASCULARIZATION THROUGH A MINI-THORACOTOMY APPROACH

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Objectives: Off-pump myocardial revascularization through a small thoracic incision can be adopted for isolated left anterior descending (LAD) disease. An evolution of this technique can be accomplished for multiple coronary disease using dedicated instruments for coronary stabilization and exposure (Multi-Vessel Small Thoracotomy MVST).

Methods: A 6-8 cm antero-lateral chest incision is created in the 4th intercostal space. The left internal thoracic artery (LITA) and the radial artery (RA) are simultaneously harvested, LITA either under direct or video assisted vision, RA using a minimally invasive video assisted technique. A composite Y-graft between LITA and RA is performed through the thoracic incision. Medtronic Octopus® and Starfish® NS are respectively, used to stabilize and expose the coronary arteries, bringing coronary targets into the operative thoracic window. Both instruments are provided with shafts allowing remote insertion. Coronary anastomoses are completed using conventional instruments and techniques.

Results: From September 2005 to January 2008, 35 patients underwent MVST. Mean grafts number was 2.2±0.5. LITA was always used on the LAD, RA either as single or sequential graft on marginal branches and posterior descending coronary artery. There were no perioperative death or myocardial infarction. Mean follow-up time is 325±179 days. All patients are free from angina with negative ergometric stress test.

Conclusions: Complete arterial myocardial revascularization through a mini-thoracotomy is feasible using dedicated instruments for myocardial stabilization and exposure. This approach uphold all the benefits coming from off pump myocardial revascularization avoiding complications from median sternotomy, aortic manipulation and allowing a faster postoperative patient recovery.

C1-5

RANDOMISED COMPARISON OF VASODILATOR EFFECTS OF ILOPROST VS. DILTIAZEM ON FLOW AND PATHOLOGICAL CHANGES IN RADIAL ARTERIES: MID-TERM ANGIOGRAPHIC CONTROL STUDY

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Objectives: The increasing prevalence of the routine use of radial artery in CABG has rendered the pharmacological prevention of spasm of this artery in the early period a critical point. With this purpose, the effects of iloprost and diltiazem on vasospasm were compared in our study.

Methods: Seventy patients who underwent CABG using the radial artery were randomized into two groups and the vasodilator effects of iloprost and diltiazem were studied prospectively. RA flow was measured using Doppler USG. Following harvesting, a 5-mm piece was removed from the RA distally for pathological examination. In Group B, diltiazem infusion was made prior to removal of the RA, while iloprost infusion was initiated five days prior to surgery in Group A. At the end of a two-year follow-up, each case underwent coronary angiography.

Results: Doppler flow measurements made during harvesting revealed statistically significant flow reduction and pathological examination of the RA revealed significant luminal narrowing in Group B. Two-year angiographic follow-up revealed patent all of RA grafts in Group A.

Conclusions: The results evaluations revealed superior efficiency of iloprost over diltiazem in prevention of RA spasm in the early period and these results have been supported by two-year angiographic findings.

C1-6

ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION

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Objectives: The incidence of left ventricular (LV) dysfunction and atrial fibrillation (AF) after coronary artery bypass grafting have paradoxically increased together with population aging and profile of comorbidities. The aim of this study was to determine the incidence of postoperative AF and its independent predictors in patients with LV dysfunction undergoing coronary artery bypass grafting (CABG).

Methods: We retrospectively analysed data collected from 2790 CABG cases in two university hospitals between January 2000 and December 2006. A total of 223 patients with an echocardiographic ejection fraction <35% were selected and constituted the study population (mean age: 65.6±9.1 years; 85.2% men). Hospital mortality and postoperative survival data were also investigated.

Results: Postoperative AF occurred in 73 (32.7%) patients. Patients suffering from AF revealed age (OR 1.08, 95% CI 1.04-1.12) and postoperative intra-aortic balloon pump (OR 4.73, 95% CI 1.98-11.29) and, with a borderline correlation, chronic obstructive pulmonary disease (COPD, OR 3.56, 95% CI 0.96-6.79) as independent predictors for AF development. The overall hospital mortality in AF patients was 5.5% vs. 2.7% of patients without it, although not significant. Early and mid-term survival was significantly decreased in AF patients compared with patients without this arrhythmia.

Conclusions: In patients with reduced LV function, AF after cardiac surgery is an important sign of reduced postoperative survival. A close surveillance in patients with LV dysfunction and postoperative AF should be applied. In these patients age, IABP requirement and COPD may be considered relevant independent AF predictors in order to establish an effective preventive prophylactic approach.

C1-7

IS THE OCCLUSION TIME VALUE, MEASURED BY PLATELET FUNCTION ANALYZER (PFA-100), A GOOD PREDICTOR OF POSTOPERATIVE BLEEDING COMPLICATIONS IN CORONARY ARTERY SURGERY

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Objectives: Coronary artery disease (CAD) surgery during or shortly after antiplatelet therapy with acetylsalicylic acid (ASA) is identified as a predictor of bleeding complications after the procedure. Until now there are not known a good laboratory tests for estimation of platelets function: adhesion and aggregation and prediction of bleeding after surgery. The purpose of this study is to evaluate the influence of prolonged occlusion time (OT) (Coll/Epi) measured by PFA 100 platelet analyzer on early postoperative results after CABG or OPCAB procedures.

Methods: Three hundred and twenty-three consecutive CAD patients, operated from January 2004 till December 2007, treated with ASA, in whom platelet reactivity exam was performed during last 24 preoperative hours with PFA-100. The patients transfused with platelet concentrate intra or postoperatively were excluded from the study. Patients were divided into two groups: GROUP I: 177 patients with normal OT (85-165 s) and GROUP II: 146 patients. with prolonged OT >165 s. Preoperatively the demographic data, CCS and NYHA status, LV EF value, EuroSCORE risk value, co-morbidities and full blood count were analyzed. Postoperatively the mortality rate, morbidity, total chest tube drainage, need for re exploration because of bleeding and blood transfusion were compared. Statistical analysis was made using *t*-student, χ^2 -tests and multivariate regression analysis. *P*<0.05 was considered statistically significant.

Results: Preoperatively the demographic data, CCS and NYHA status, LV EF value and EuroSCORE risk value were comparable. In group I the blood hemoglobin level was higher then in group II (8.6±0.8 mmol/l vs. 8.4±0.9 mmol/l, *P*<0.05). The rate of COPD was lower in group I (3% vs. 10%, *P*<0.05) as well as the rate of cerebrovascular disease (13% vs. 23% *P*<0.05). Overall mortality rate was 1.5% (five patients). There were no differences in postoperative total chest tube drainage (885.1±400.7 ml vs. 918.2±327.8 ml, *P*=NS), rate of re exploration because of bleeding (1.6% vs. 1.3%), rate of RBC transfusion (50% vs. 53%). There were no differences on postoperative major neurological events, gastrointestinal complications and renal insufficiency. The time of ICU stay, hospital stay, mechanical ventilation was comparable between the groups. **Conclusions:** Prolonged occlusion time (Coll/Epi) measured by PFA-100 before surgery is not a predictor of postoperative bleeding complications in coronary artery surgery patients.

C1-8

LONG-TERM SURVIVAL AFTER CABG IN DIABETICS WITH AGGRESSIVE RISK FACTOR MANAGEMENT

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Objectives: Diabetics after CABG have poor long-term survival. Our practice emphasized strict glycemic control and risk factor modification. Whether this strategy provides a survival advantage remains undefined.

Methods: Between 1991-2000, 973 patients underwent isolated CABG. There were 313 patients (32%) with diabetes (DM). Perioperative glucose was maintained <200 mg/dl, and angiotensin converting enzymes, statins, B-blocker, and ASA were used routinely postoperatively. Data was prospectively collected and medication use was captured via electronic patient record system.

Results: DM vs. non-diabetics (NDM) were older (64 vs. 62 years, $P=0.017$), had larger BSA (2.02 vs. 1.9, $P<0.001$), and higher LVEDP (17.6 vs. 16.2 mmHg, $P=0.021$), hypertension (AOSP) (140 vs. 134 mmHg, $P=0.004$), pulmonary hypertension (PASP) (35.8 vs. 31.7 mmHg, $P=0.012$), and NYHC III-IV ($P=0.001$). Although DM had more diffuse CAD ($P=0.005$), they had similar number of grafts (2.57 vs. 2.49, $P=0.065$). Survival for DM vs. NDM at one, five, and ten years was 90% vs. 95%, 78% vs. 85%, and 58% vs. 72%, respectively ($P<0.001$). Among the DM cohort, regression analysis demonstrated only PASP affecting survival ($P=0.04$). AOSP, age, BSA, LVEDP, and OPCAB did not influence survival. A prior history of an MI in patients with DM did not adversely affect survival ($P=0.132$).

Conclusions: Diabetics, regardless of aggressive postoperative risk management, have sustained lower survival benefit long-term. Technique of revascularization does not appear to influence survival in diabetics. Surgical revascularization in DM may attenuate the reported adverse prognostic impact of a prior MI. It remains to be determined whether more strict perioperative glucose control (<180 mg/dl) and incorporation in to a risk-factor modification clinic reduces long-term mortality.

C1-9

NO-TOUCH AORTA TECHNIQUE IMPROVES OUTCOMES OF CABG SURGERY IN ELDERLY PATIENTS

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Objectives: Albeit a steadily growing number of octogenarians are referred for CABG nowadays, controversial data are available in such specific subset of patients. We, therefore, sought to evaluate the potential advantages of a no-touch aorta technique for myocardial revascularization when compared to conventional CABG.

Methods: We retrospectively evaluated 51 consecutive patients older than 80 years of age undergoing isolated CABG between January 1, 2000 and December 31, 2006. Twenty-four patients undergoing no-touch aorta technique (Group A, off-pump total arterial CABG with composite grafts) were compared with 27 patients undergoing conventional CABG (Group B, on-pump LITA on LAD, with/without composite arterial grafts plus additional saphenous grafts). Pre-operative variables were similar between the groups, in terms of number of diseased coronary vessels, age, gender, obesity, diabetes, pulmonary or systemic hypertension, chronic renal failure, atrial fibrillation, previous myocardial infarction and ascending aorta calcification. Mean Additive EuroSCORE was 9.7 in Group A vs. 8 in Group B ($P=NS$). Functional health and quality of life (by means of SF-36 questionnaire) was performed at follow-up.

Results: All patients in Group A successfully underwent full arterial CABG surgery by means of an off-pump no-touch aorta technique. The degree of myocardial revascularization was similar between the groups (grafts/patients: Group A=2.16 vs. Group B=2.3, $P=NS$). Hospital mortality was different among the groups (Group A=0% vs. Group B=11%, three patients) although it did not reach statistical significance ($P=NS$). The overall incidence of post-operative complications was significantly inferior in Group A than in Group B ($P=0.046$). All patients were followed-up for a mean of 3.6 and 4.1 years in Group A and B, respectively; four patients died in Group A (cardiac-related, $n=3$) and six patients in Group B (cardiac-related, $n=3$). Survival-free from cardiac related events was better in Group A either at one year (Group A=96% vs. Group B=70%) and at four years (Group A=83.4% vs. Group B=70%). All survivors at follow-up in both groups enhanced their functional status (NYHA class I-II), and none required additional PTCA procedure or redo surgery. Finally, the SF-36 Questionnaire demonstrated similar results in patients undergoing full arterial OPCAB and conventional CABG (MCS score: Group A=46 vs. Group B=37, $P=NS$; PCS score: Group A=32.5 vs. Group B=30, $P=NS$).

Conclusions: Our results suggest that totally arterial CABG, with no-touch aorta technique is feasible in octogenarians and able to improve early and mid-term outcomes.

C1-10

TRANSMYOCARDIAL LASER REVASCLARIZATION COMBINED WITH HUMAN RECOMBINANT ENDOTHELIAL CELLULAR GROWTH FACTOR (ALFA-ECGF) THERAPY IN PATIENTS WITH END-STAGE CORONARY ARTERY DISEASE: RANDOMISED SINGLE-BLIND PLACEBO CONTROLLED PILOT STUDY

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Objectives: The present article is a report of our first clinical results of a new treatment for coronary artery disease (CAD) using human recombinant Growth Factor (GF) alfa-ECGF (Endothelial Cellular Growth Factor) in combination with transmucosal laser revascularization to increase perfusion and to improve quality of life of patients with chronically ischemic myocardium.

Methods: This is the first randomized single-blind placebo-controlled clinical trial of an intramyocardial infusion of alfa-ECGF in combination with TMR. To be enrolled in the trial, patients were required to meet the following criteria: Canadian Cardiovascular Society (CCS) class III or IV angina that was refractory to medical treatment, reversible ischemia of the left ventricular free wall, and coronary disease that was not amenable to coronary artery bypass grafting or percutaneous transluminal coronary angioplasty. Twenty patients were treated to TMR (sole, combined with CABG performed with extracorporeal circulation or OPCAB - 1-st group) in combination with alfa-ECGF and 20 other patients had TMR (sole, combined with CABG performed with extracorporeal circulation or OPCAB - 2-nd group) with PLACEBO. The results were analyzed in both groups: 1st group - patients with angiogenic factor; 2nd group - patients with PLACEBO. Efficacy of the procedure was evaluated at 1, 3, 6 and 12 month. We studied changes of angina symptoms, exercise tolerance, left ventricular ejection fraction, myocardial perfusion and short form 36 questionnaire score.

Results: The demand of daily nitroglycerine and mean angina class was significantly decreased and exercise tolerance increased in both groups. But we did not establish significant differences between groups. Myocardial perfusion imaging demonstrated significant changes in the rest or stress. Physical and emotional components of SF-36 form demonstrate the increased scores in both groups. But no significant differences was seen between groups.

Conclusions: A single intracoronary infusion of alfa-ECGF in combination with TMR improve exercise tolerance, decline angina class and daily demand in nitroglycerine. This combination improves myocardial perfusion and quality of life. But there was no differences when compared with placebo group. These data gives evidence that all those changes has not been caused by growth factor alfa-ECGF.

April 25th, 2008 2nd Congress Day

14:30-16:00

2nd Cardiac Scientific Session - Ascending Aorta Aneurysms

C2-1

26-YEAR EXPERIENCE OF TYPE A AORTIC DISSECTION SURGICAL TREATMENT: LONG-TERM RESULTS AND ANALYSIS OF THE INVOLVED VARIABLES

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Objectives: Acute type A aortic dissections are considered surgical emergencies because affected patients are at risk for life-threatening complications. We report a single-centre 26-year-experience in the surgical treatment of type A aortic dissection.

Methods: From 1981 to 2006, 177 consecutive patients (127 males) underwent emergent surgery for type A aortic dissection. Mean age was 60.6±12.1 years. The diagnosis was achieved by angio-CT scan and transesophageal echocardiography. All operations were performed using cardiopulmonary bypass (CPB) by cannulation of a common femoral artery ($n=144$) or right axillary artery ($n=33$) and the right atrium. Mean CPB time was 207.2±79.8 min, mean aortic cross-clamping was 128.7±56.4 min. Profound hypothermia (18-25 °C) was used in all cases. The aortic arch was repaired during circulatory arrest (mean arrest time 50.0±37.4 min), with retrograde or, more recently, antegrade cerebral perfusion. Perioperative and long-term mortality have been investigated by Kaplan-Meier curves, comparing patients gender, different cannulation sites and the period of operation (1981-1996 vs. 1997-2006).

Results: Mean follow-up time was 70.7±65.6 months. We report an overall perioperative mortality of 37.3%. Freedom from death was 47% at 1 year, 39% at 5 years, 29% at 10 years, 23% at 20 years. In-hospital mortality was 45% for patients operated between 1981 and 1996, 28% for patients operated after 1996 ($P=0.021$). A tendency to better long-term survival has been observed in males, while not reaching statistical significance ($P=0.12$). A statistically significant better long-term survival has been observed in patients who

underwent right axillary artery cannulation ($P=0.006$) and in patients operated after 1996 ($P=0.027$).

Conclusions: Type A aortic dissection is a life-threatening condition, requiring emergent surgery. Despite the still elevated mortality in operated patients, a considerably better outcome has been achieved in the recent years by a global improvement in surgical and clinical management. The main determinant seems to be the site of arterial cannulation, with a significant better survival in patients undergoing right axillary artery cannulation.

C2-2

INTENDING COMPLETE THORACIC AORTIC REPAIR IN ACUTE TYPE A AORTIC DISSECTION WITH A HYBRID STENTGRAFT PROSTHESIS

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Objectives: In acute type A aortic dissection emergent surgical repair with resection of the proximal entry tear/s is essential. However, in case of additional entries in the distal aorta, the false lumen in the descending aorta remains perfused, so that secondary surgical and/or endovascular interventions for malperfusion as well as aneurysm formation may be mandatory. In order to intend primary a complete thoracic aortic repair in those cases, a new hybrid stentgraft was used.

Methods: From January 2005 to January 2008 in 27 of 47 patients, who underwent emergent surgery for acute type A aortic dissection, the false lumen extended into the descending aorta. In 18 cases (mean age 59 ± 12 years) a hybrid stentgraft prosthesis (E-vita open®) was inserted in antegrade fashion into the descending aorta after total aortic arch resection. At the proximal stentgraft-end an integrated woven vascular prosthesis allows continuous arch replacement. Nine patients underwent isolated ascending and arch replacement and were excluded from the study. Selective antegrade cerebral perfusion (SACP) and hypothermic circulatory arrest (HCA) was performed in all cases. Postoperative imaging procedures were performed in all patients to investigate the fate of the false lumen throughout the follow-up period.

Results: Cardiopulmonary bypass time was 249 ± 58 min, SACP was 63 ± 17 min and HCA was 11 ± 8 min. Complete thoracic aortic repair was achieved immediately in 17/18 (94%) cases. In one case a retrograde endovascular stentgraft stenting for a type II endoleak was required. The in-hospital mortality was 6% (1/18). The false lumen in the stentgrafted aorta remained thrombosed in 16/18 (89%) cases during a follow-up period of a mean of 16 months. In one case a new distal endoleak was observed after 16 months and has been overstented. Four patients (4/17, 24%) succumbed in this period, not related to thoracic aorta associated complications.

Conclusions: The new hybrid stentgraft allows complete thoracic aortic repair in acute type A aortic dissection without increased mortality due to the extension of the emergent surgery into the descending aorta. The thrombosed false lumen remained occluded in all but one patient and demonstrated a tendency to shrink.

C2-3

REIMPLANTATION VALVE-SPARING AORTIC ROOT REPLACEMENT WITH THE VALSALVA GRAFT: WHAT HAVE WE LEARNT AFTER 100 CASES?

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Objectives: Reimplantation valve-sparing aortic root replacement has been increasingly performed with improving peri-operative and mid-term results. The success of this operation primarily depends on preserving the extremely sophisticated dynamic function of the aortic valve by recreating an anatomical three-dimensional configuration similar to that of the aortic root, thus minimizing the mechanical stress and strain on the cusps. Over the years, several techniques have been proposed to reproduce the sinuses of Valsalva. We reviewed our experience with aortic valve reimplantation by means of a modified Dacron graft that incorporates sinuses of Valsalva, in a series of 100 consecutive patients.

Methods: During a 60-month period, 100 patients with aortic root aneurysm underwent aortic valve reimplantation using the Gelweave Valsalva prosthesis.

There were 74 males and the mean age was 60 ± 12 years (range 28-83 years). Five patients had the Marfan's syndrome, 15 had a bicuspid aortic valve. Cusp repair was performed in five patients. The mean follow-up time was 28.6 months (range 1-60). Transesophageal echocardiogram was performed at the end of each procedure to assess the aortic valve dynamic motion within the graft. None of the patients left the operating room with an aortic incompetence (AI) $> 2+$.

Results: There was one hospital death and two late deaths. Overall survival at 60 months was $91.7\pm 5.1\%$. Five patients developed severe aortic AI during follow-up requiring aortic valve replacement (AVR). The 60-month freedom from reoperation due to AI was $90.9\pm 4.4\%$. One patient had moderate AI at latest echocardiographic study. The 60-month freedom from AI $> 2+$ was $91.6\pm 7.9\%$. Cox regression identified cusp's repair as independent risk factor ($P=0.001$) for late reimplantation failure (AVR or AI $> 2+$). There were no episodes of endocarditis and the majority of the patients (88%) were in New York Heart Association functional class I.

Conclusions: The aortic valve reimplantation with the Gelweave Valsalva prosthesis provided satisfactory mid-term results. An accurate assessment of the valve's dynamic motion by means of intraoperative transesophageal echocardiogram at the end of each procedure is mandatory in order to detect any cusp's prolapse and avoid early reimplantation failure. Cusp's repair may play an important role in the development of late AI. However, long-term results are needed in order to define the durability of this technique.

C2-4

FATE OF THE RESIDUAL DISTAL AORTA AFTER ACUTE TYPE A DISSECTION REPAIR

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Objectives: The aim of this study is to assess the natural course of residual distal dissection after repair of acute type A aortic dissection.

Methods: From September 2003 to March 2007, 52 consecutive patients underwent repair of acute type A aortic dissection at our aortic center. Excluding three hospital deaths, two late deaths within six months after the operation, and 11 patients without preoperative dissection in the descending aorta, 36 patients with preoperative patent false lumen in the descending aorta were divided into two groups: 1) 16 patients with ascending aortic graft replacement (Group 1) and 20 patients with extended total arch graft replacement (Group 2). Contrast-enhanced computed tomography (CT) was repeated after 26 ± 13 months in all 36 patients. The entry resection was performed in all patients but only one patient who had the entry at the supra-celiac aorta.

Results: CT revealed that the residual distal aorta was dilated in 11 (69%) in Group 1 and 7 (35%) in Group 2 ($P=0.19$), and false lumen in the descending aorta was patent in these dilated 18 patients. In patients with patent false lumen in the descending aorta, 8 (73%) of 11 in Group 1 had new entry at the site of distal anastomosis, and remaining three in Group 1 and all of seven in Group 2 had new entry in the descending aorta, which had been preoperative re-entry. Incidence of new entry at the site of distal anastomosis was 50% in Group 1, while 0% in Group 2 ($P<0.01$). Aneurysmal change (diameter more than 50 mm) occurred in 4 patients in Group 1 and in no case in Group 2 ($P<0.05$).

Conclusions: Our results suggest that extended total arch replacement may be optimal surgery to prevent progression of distal aortic disease in emergency repair for acute type A aortic dissection with preoperative patent false lumen in the descending aorta.

C2-5

EFFICACY OF TOTAL ARCH REPLACEMENT WITH BRANCHED OPEN STENTGRAFTING TECHNIQUE FOR ACUTE TYPE A AORTIC DISSECTION

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Objectives: Total arch replacement (TAR) is generally recommended for acute type A aortic dissection (AD(A)) when the intimal tear is located in the transverse arch, but the treatment is associated with high operative risk. We have performed TAR with open stent grafting technique (OSG) since

1994 and modified the procedure with branched stent grafting from 2004 to perform TAR in the same process as hemiarch replacement. The objective of this study is to elucidate the result of TAR with branched OSG for acute AD (A) in comparison with conventional procedures.

Methods: From January 2000 to August 2007, 75 patients with acute AD (A) underwent emergent surgery at our institution. Among them, eight patients who were treated with TAR with branched OSG (group A), 40 with ascending aorta/hemiarch replacement (group B), 10 with conventional TAR (group C) are involved in this study. Seventeen patients with concomitant procedures such as valve replacement or CABG are excluded. All the patients underwent MDCT or angiography preoperatively to detect the location of the intimal tear. TAR with branched OSG is described briefly as follows; During core cooling, the proximal anastomosis in the ascending aorta is completed in usual fashion. After deep hypothermic circulatory arrest, the aortic arch is transected between the brachiocephalic artery and the left common carotid artery. The main body of the stentgraft is inserted into the descending thoracic aorta. Simultaneously, the branches of the stentgraft are inserted into the left common carotid artery and the left subclavian artery.

Results: The average operative time was 396, 443, 619 min in group A, B, C, respectively (A vs. C; $P < 0.05$, B vs. C; $P < 0.01$, A vs. B; NS). The average circulatory arrest time was the same between group A and B. Operative mortality was 0, 15, 0% in group A, B, C, respectively (NS).

Conclusions: TAR with branched OSG for acute AD (A) could be performed in the same operative time and invasiveness compared with ascending aorta/hemiarch replacement.

C2-6

NEW SYNTHETIC VALVECONTAINING CONDUIT

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Objectives: For reconstruction in children for right ventricular outflow tract (RVOT) biological conduits are commonly used, with increased risk for accelerated calcification with subsequent valvular stenosis. New synthetic conduit was created for RVOT re-implantation.

Methods: Aortic root (AR) was chosen as prototype. AR consists of some elements: ventriculo-arterial ring, fibrous annulus, sinus of Valsalva (SV), leaflets, commissures, undercommissure's triangulares and sinotubular junction. In a morgue on 40 hearts, according to a specially worked out original protocol we counted morphometry all of AR's elements.

Results: Based on the observed data new synthetic tree leaflets, semilunar AR was created. This conduit has not only all AR's elements, but has a similar form (licensed under RU#2293543, April 25, 2005). The conduit was used in Ross procedure in 13-years girl for RVOT reconstruction. In 24 months there was no any degeneration process in conduit. The most recent peak and mean transvalvular gradients were counted after operation, in 12 and 24 months - 22 mmHg, 25 mmHg, 22 mmHg and 14.8 mmHg, 15.3 mmHg, 13.0 mmHg, respectively. The conduit was used in Ross procedure in 13-years girl for RVOT reconstruction. In 24 months there was no any degeneration process in conduit. The most recent peak and mean transvalvular gradients were counted after operation, in 12 and 24 months - 22 mmHg, 25 mmHg, 22 mmHg and 14.8 mmHg, 15.3 mmHg, 13.0 mmHg, respectively.

Conclusions: New synthetic conduit has no any degeneration, comparing to a biological one, and we see good hemodynamics, as a biological conduit as well. This synthetic AR may be one of the variant for RVOT reconstruction.

C2-7

TREATMENT OF ANEURYSMS IN THE AORTA COARCTATION CORRECTION ZONE

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Objectives: Aneurysms at the site of coarctation of the aorta repair is relatively rare, but life threatening complication, which causes aorta rupture and death.

Methods: The remote results of 4196 patients after aorta coarctation correction operated upon from 01.01.1960 to 01.01.2007 were studied. The management of aorta coarctation includes the resection of the narrowing followed with the end-to-end anastomosis (2547 patients; 60.7%), aortoplasty with a patch (1161; 27.7%), aorta prosthesis (207; 4.9%), shunting (61; 1.4%), Waldhausen operation (63; 1.5%), Blalock (11; 3%), and balloon dilatation of the narrowing (146; 3.5).

The aneurysm was diagnosed during X-raying, when the rounded shadow was visualized as left-contouring the arc of aorta. The diagnosis was verified aortographically.

Results: The aneurysm formation in the aorta coarctation correction zone was established in 114 (2.7%) operated patients. Eighty-nine patients (78.1%) underwent operation; 25 patients (21.9%) turned down the treatment on various grounds and all of them died within seven years. The operations were carried out under conditions of distal circulatory support with the help of by-pass ascending-and-descending aortal shunt in 82 patients (92.1%); in five cases (5.6%) extracorporeal circulation was used, and two patients (2.3%) were operated on without support.

Conclusions: These results allow concluding that in some cases the aneurysms after the correction of aorta tend to develop in the remote period threatening the patients life, which needs lifelong regular medical check-up in order to timely diagnose and treat this complication.

C2-8

EXPERIENCE WITH DJUMBODIS SYSTEM DURING SURGICAL TREATMENT OF AORTIC TYPE A DISSECTION

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Objectives: Aortic type A dissection is a dramatic event that requires emergency replacement of ascending aorta. In those cases in which the aortic arch and the thoracic descending aorta are not dealt with the patients are exposed to late complications such as expansion of the residual false lumen and delayed rupture.

Methods: Between January 2005 to March 2007, 18 patients were referred to our department with the diagnosis of aortic Type A dissection. The mean age was 66.25 years. After the replacement of ascending aorta, during antegrade selective cerebral perfusion and moderate hypothermic circulatory arrest, a balloon-expandable uncovered stent (Djumbodis-Dissection System, Saint Come-Chirurgie, Marseille, France) was inserted in the aortic arch and descending thoracic aorta.

Results: The in-hospital mortality was 7.6%. The major complication were bowel ischemia and renal failure in two patients. In the postoperative CT-scan the false lumen was completely closed with thrombi in 11 patients. Neither delayed rupture or dilatation were reported.

Conclusions: In our experience the insertion of the Djumbodis System, together with replacement of ascending aorta and/or aortic arch, allowed the restoration of the true lumen and the complete exclusion of the false lumen in the majority of the patients with easy and reproducible technique.

April 25th, 2008 2nd Congress Day

14:30-16:00

3rd Cardiac Scientific Session - Congenital

C3-1

WHEN THE AMPLATZER® ATRIAL SEPTAL OCCLUDER CAN MIGRATE

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Objectives: To close atrial septal defects (ASD) the Amplatzer® atrial septal occluder (AASO) is widely used. However, it can migrate into the pulmonary artery. Our aim is to determine why it does that and how to avoid it.

Methods: The AASO was used in 75 consecutive patients in our institution. These were 5-63 year old (23.4±18.6); 39 were females. In 33 cases the AASO was needed to close a POF (permeable oval foramen). In the remaining 42 cases AASO was used to close an ASD: 40 of them were <30 mm and the other two were longer. All ASD had a clear rim.

Results: The AASO migrated into the pulmonary artery in two cases (man and woman, 17 and 21 year old), both ASD bigger than 30 mm, so it had to be removed performing a CPB procedure. In both cases the operation went well, they could be weaned shortly after closure of the ASD and the AASD rescue, being hospital-discharged in good condition. All AASO remaining implants were fine.

Conclusions: AASO device implantation can be safe in all POF and ASD cases with diameter <30 mm but unsuccessful when that was bigger. Therefore, the Amplatzer atrial septal occluder must be avoided when the diameter is bigger than 30 mm.

C3-2 SURGICAL MANAGEMENT OF ARCH HYPOPLASIA IN ADOLESCENTS AND ADULTS

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Objectives: Resection of the coarctation area and extended end-to-end anastomosis with preserved growth potential and no graft material used may be a good option in young children. But in adolescents, adults or previously operated patients, graft replacement of the distal arch and isthmus are often needed. Despite evidence in the literature, no deep hypothermic circulatory arrest was used for brain or spinal cord protection.

Methods: Fifty-five patients (42 male and 13 female) were operated on for hypoplastic aortic arch between 1990 and 2007. Their mean age was 14.5±6 years (range 4-58 years). The mean systolic gradients, as shown by echocardiography and cardiac catheterization, were 60±18 mmHg and 53±24 mmHg, respectively. There were 20 patients with complex coarctation after one or two previous repairs. Seventeen cases of extraanatomic bypass grafting were accomplished through a right thoracotomy without cardiopulmonary bypass. Other operations were performed through a left thoracotomy using an extended end-to-end anastomosis in 16 patients, graft interpositioning in 18 patients and polytetrafluoroethylene patch in two patients. Two cases repaired using arch enlargement by left brachiocephalic trunk formation. In addition, to arch enlargement, 14 patients had left common carotid and left subclavian artery reconstructions. Distal aortic perfusion with antegrade selective perfusion of brachiocephalic branches and moderate hypothermia without circulatory arrest were used for brain and spinal cord protection in 22 cases. The mean perfusion time was 57±26 min.

Results: There was no in-hospital mortality. All patients had an eventful postoperative course and were discharged home 8-12 days following operation. Antihypertensive medication was stopped in all patients. The midterm 5-year survival was 98%. The time-related freedom from recurrent coarctation, defined as the presence of arm to leg gradient exceeding 20 mmHg on follow-up echocardiogram, was 99% and 96% for 3 and 5 year, respectively.

Conclusions: Effective repair of distal aortic arch hypoplasia in adolescents and adults can be performed through a left thoracotomy without hypothermic circulatory arrest. In patients with high operative risk or with unfavorable anatomy extraanatomic bypass grafting can be used more safely. This approach allows decreasing the rate of early complications and provides satisfactory late result.

C3-3 IN-HOSPITAL RESULTS OF SURGERY IN GROWN-UP CONGENITAL HEARTS (GUCH)

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Objectives: To present mortality and morbidity after repair of GUCH.

Methods: Seven hundred and ninety-two patients. with GUCH divided in to five age groups: 16-20 years - 392 patients, 21-30 years - 315 patients, 31-40 years - 56 patients, 41-50 years - 19 patients, >50 years - 10 patients. Sex ratio 1.4 with predominance of male patients. Two hundred and forty-seven patients underwent surgery including: 126 - with ASD, 34 - with VSD, 38 - with PDA, 13 - with PA valve stenosis, 12 - with TOF, 7 - with AVC (partial form), 8 - with Coarctation of the Aorta, 6 - with Lutembacher syndrome, 2 - with Ebstein Anomaly and 1 - with Ao Valve stenosis.

Results: Ninety-one patients (36.8%) underwent complicated ICU-period and 18 (7.3%) of them were lost. Morbidity/mortality rate 5.04. Spectrum of post/op. complications included: right cardiac failure - 20 patients, wound complications - 14 patients, bleeding - 13 patients, respiratory insufficiency - 11 patients, leakage (minimal) - 11 patients, neurological complications - 4 patients, renal block - 6 patients. Most of patients spent ICU-period with rhythm disturbances such as AF-7 patients, supraventricular arrhythmias - 18 patients, high graded VEB - 27 patients, sinus bradycardia - 20 patients, acute heart block in post-pump and ICU-period - 7 patients. In six of them sinus rhythm restored before discharge from the unit and one patient underwent

pacemaker insertion. Two months later he also restored sinus rhythm, but refused from pacemaker extraction. More complicated ICU-period and poor results observed after repair of PA valve stenosis, TOF and VSD with rate of mortality: 30.7%, 25% and 11.7%, consequently. Insertion of bloodless CPB, cool pharmacology cardioplegia (St. Thomas), prolonged administration of nitrates resulted in reducing morbidity and mortality from 45.5% >36.8% and 9% >7.3%, consequently. In last 45 procedures no one of patients was lost. Our experience with sildenafil in high PA hypertension restricted by four patients with ASD, underwent per os medication during one month until surgery. Use of sildenafil in GUCH complicated with high PA hypertension need in more experience and research.

Conclusions: 1. Most of GUCH underwent surgery in more gravity status than young patients with such common complications of natural history as: high PA hypertension (40.3% patients, including 6.3% with Eisenmenger syndrome), cardiac rhythm disturbances (70% patients) and bacterial endocarditis (3% patients). 2. In spite of essential pre morbidity the vast majority of GUCH could be repaired with suitable in-hospital and follow-up results. 3. GUCH complicated with high PA hypertension need in nitrates infusion in post-pump and ICU-period with prolonged per os nitrates medication at least for one year follow-up period. Sildenafil medication vs. nitrates in such patients demand a cup of experience.

C3-4 SURGICAL STRATEGY IN COMPLEX CONGENITAL HEART DEFECTS: ONE AND ONE HALF VENTRICULAR REPAIR

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Objectives: One and one half ventricular repair is a strategy used in patients with right ventricular hypoplasia as an alternative to Fontan operation or as an attempt to minimize right ventricular failure after biventricular repair. However, indications for this procedure are not well established. The study is aimed to analyze the experience with one and one half ventricular repair and to clarify indications for this type of intervention in different categories of patients.

Methods: During the years 1999-2007, one and one half ventricular repair was used in 50 patients aged from 1.5 to 28 years (mean, 7.9±4.5 years). Retrospectively, they were divided into four groups: I. Patients with hypoplastic right ventricle (n=16); II. Patients with Ebsteins anomaly and compromised right ventricle (C and D type by Carpentiers classification) (n=18); III. Patients with hypoplastic right ventricle combined with double outlet right ventricle, tetalogy of Fallot or transposition of the great arteries with VSD (n=9); IV. Patients after a complete repair of transposition of the great arteries with VSD, isolated pulmonary stenosis or Ebsteins anomaly resulted in acute right ventricular failure (n=7). In all cases, intracardiac repair was combined with bidirectional cavopulmonary shunt. The duration of follow-up period in 25 patients ranged from six months to seven years (mean, 3.2±1.4 years).

Results: Group I patients had a tricuspid valve Z-score ranged from -2 to -10 (median, -6.75), and right ventricular inlet/outlet ratio ranged from 0.53 to 0.77 (mean, 0.71±0.10). Group II patients had hypoxemia (mean arterial blood oxygen saturation of 81.1±7.6%) and cardiomegaly (mean cardio-thoracic index equal to 69.6±7.4%). Group III patients had a moderate right ventricular hypoplasia (median tricuspid Z-score and mean right ventricular inlet/outlet ratio equal to -5.03 and 0.67±0.11, respectively). Hospital mortality was as high as 100% in group IV. In groups I, II, and III, mortality was equal to 14%, 17%, and 33%, respectively. Late mortality was absent. At follow-up examination, 92% of patients were in I-II New York Heart Association class.

Conclusions: Elective one and one half ventricular repair is indicated for patients with a moderate right ventricular hypoplasia or dysfunction when a complete repair is associated with a high risk. Bidirectional cavopulmonary shunt performed as an urgent intervention aimed to treat right ventricular failure after a complete repair is accompanied by a poor result.

C3-5 PULMONARY ARTERY STENOSIS AFTER ARTERIAL SWITCH OPERATION: TIMING FOR REOPERATION

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Objectives: Arterial switch operation (ASO) is the preferred surgical procedure for transposition of great arteries with favorable late results. Yet, it is associated with a number of complications. Pulmonary artery stenosis (PAS) is the most common complication necessitating surgical intervention after

ASO. Many surgical measures have been defined to overcome PAS after ASO. Aim of this study is to discuss possible causes of PAS and to revise management strategy by reviewing past experience.

Methods: Two hundred and seven patients who had undergone ASO between 2000 and 2006 were revised. Pulmonary stenosis occurred in 27 of the 185 survivors (14.6%). Branch pulmonary artery stenosis was present in 10 patients. Nine patients had initially a balloon angioplasty. Relief of the stenosis could be achieved in four patients. Twenty-three patients were operated for pulmonary stenosis. Half of these patients had a limited trans-annular patch with bovine pericardium. The other half received an anterior triangular patch for main pulmonary trunk and branches. The mean duration between ASO and reoperation for PAS was 13 months (3 months to 5 years). Results: Peak right ventricular pressure decreased from 86 to 45 mmHg. There has been no mortality. One patient experienced a temporary neurological dysfunction. None of the patients required a second intervention after pulmonary reconstruction.

Conclusions: Surgical reintervention after ASO for stenotic branch pulmonary arteries, main pulmonary trunk or pulmonary annulus is sometimes necessary. Such a reoperation is generally well tolerated by an anatomically corrected heart. Early intervention is encouraged before development of infundibular hypertrophy which may require a transannular patch enlargement or a conduit placement in order to avoid the need for further interventions.

C3-6

TOTAL CAVOPULMONARY CONNECTION FOR APICOCAVAL JUXTAPOSITION - CONSIDERATION ABOUT THE ROUTE OF CONDUIT

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Objectives: Single ventricle physiology with apicocaval juxtaposition is relatively rare complex, and there is difficulty to decide a route of conduit to complete total cavopulmonary connection (TCPC). The purpose of this study is to examine our cases and consider the appropriate route.

Methods: Twenty-three consecutive patients with single ventricle physiology with apicocaval juxtaposition (mean age 4.4±3.6 years) who underwent TCPC from 1996 to 2007 were enrolled in this study. Viscero-atrial situs solitus was seen in 8, situs inversus in 10 and heterotaxy in 5. The bidirectional Glenn anastomosis had preceded TCPC in seventeen (74%). An artificial graft was placed in the same side of apex in ten (group A), the opposite side in thirteen (group B). The intra-atrial conduit TCPC was performed in eight and the extra-cardiac conduit TCPC in two of group A. All of group B underwent extra-cardiac conduit TCPC. The location of the inferior caval vein was evaluated retrospectively using the following index (IVC index=width of the part of IVC that overlapped the vertebra/width of the vertebra×100%) from the frontal view of preoperative angiography. The similar data was measured in ten patients with tricuspid atresia as the control group (group C).

Results: There were four early mortalities caused by arrhythmia in two patients with heterotaxy, pulmonary venous obstruction in one of group A and systemic venous thrombosis in one of group B. The IVC index of group B was larger than group A and group C (45±26, 21±22 and 28±19%, P=0.03). In one of group A, whose IVC index was 80%, the sternum had to be removed partially to release oppression to the extra-cardiac conduit occurred between the heart and the sternum. In one of group B, whose IVC index was 13%, the conversion to intra-atrial conduit TCPC improved stagnant blood flow caused by a long and curved extra-cardiac conduit. One month after operation, cardiac catheter examinations showed that the length of conduit in group B was significant longer because of curved graft than group A and C (65±12, 36±14 and 44±10 mm, P<0.001), but no statistical difference neither in central venous pressure nor cardiac output.

Conclusions: The route of the same side with apex could give smooth blood flow due to a shorter and straight conduit, however, the optimal route is different in each patient. To evaluate the detailed location of the IVC is helpful to decide the appropriate route of conduit for apicocaval juxtaposition.

C3-7

SURGICAL TREATMENT OF LEFT SIDED HEART TUMORS

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Objectives: To analyse surgical treatment of left sided heart tumors (LSHT) and recommend optimum technique of LSHTI based on these results.

Methods: Four hundred and twenty-six consecutive patients (pts) with primary tumor of the LSHT were operated from January 1, 1984 till January 1, 2007 years. Tumors based at the left atrium (LA) (n=415 patients), left ventricle (LV) (n=11 patients). Malignant forms were in 10 (2.4%) patients: LA (n=9), LV (n=1). In other cases myxomas were marked in 97.6% (416): LA (406), LV (10). Mean age of patients was 54.4±6.4 year (range 8-78 years). Females 331 (77.7%), males 95 (22.3%). In the most of patients (98.2%) the bottom of the myxoma was based on any part of interatrial septum (frequently at fossae ovale). In 287 (69.5%) patients myxoma was in capsule and in 130 (30.5%) patients without one. Episodes of emboli before operation were occurred in 21 (4.4%) patients. Maternal basement was removed by wide resection of the interatrial septum (n=259 patients) (group A) and without broad resection of the septum (n=148 patients) (group B). Malignant tumor of the LA was removed with LA's wall and replaced this part of the LA with the autopericardial patch. All operations were performed with CPB and moderate hypothermia. At the last five years modified biatrial approach to LA's myxoma was used.

Results: During last six years hospital mortality (HM) in the group with LA' tumors was 2.4% (205/5). HM for malignant tumors was 20.0% (10/2): LA (n=9/2), LV (n=1/0) and for other forms - 7.9% (n=416/33): LA (n=406/31-7.6%), LV (n=10/2) The main reasons of HM were heart failure and brain damage because patients had entered to clinic with heart failure (as a rule, giant myxoma) and with previous episodes of emboli (absence of myxoma's capsule). At the late period 314 (93.8%) patients with myxomas were observed during one till 19 years after correction. There were 7 (1.9%) recurrences of myxoma (all left atrium). Four were successful reoperated. All patients belonged to group B.

Conclusions: Myxomas were occurred frequently in female age more than 45-year-old. The late result of myxoma's correction should be successful in cases with broad resection of maternal bottom (interatrial septum) and replacement one with autopericardial patch.

C3-8

40 YEARS OF SURGICAL EXPERIENCE OF INTRACARDIAC MYXOMAS: LONG-TERM FOLLOW-UP AND EPIDEMIOLOGICAL ASPECTS

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Objectives: Most common intracardiac tumors are the benign myxomas. Early surgical intervention mitigates morbidity and usually offers cure. Some data suggest an infectious factor in these tumors and certain histopathological features indicate herpes-simplex-virus type-1 infection. The aim of the study was to analyse the clinical data for the long-term follow-up and to perform immunohistochemical examination for the antigens of this virus.

Methods: Between 1965 and 2005, 79 patients (46 female, mean age: 52.6 years (range: 17 to 83 years) underwent a resection of an atrial myxoma, from a total amount of 124 intracardiac tumors. Mean follow-up was 7.4 years. Immunohistological studies with monoclonal antibodies against HSV type 1 and 2 were performed on tumor biopsies of 40 patients. Perioperative data and written questionnaires have been analysed for the clinical course and follow-up.

Results: There was no early postoperative mortality. Three patients suffered from a transient neurological disorder. The follow-up was 76% complete. Two patients had been reoperated for recurrent myxomas, after two and nine years. 14 (17%) patients had to undergo additional cardiac surgery. Immunohistology revealed no positive signals for anti-HSV-1 or -2 antigens among the 40 analysed cases.

Conclusions: Complete surgical resection, septum included is the treatment of choice and mandatory to prevent relapse. Perioperative morbidity and mortality is low even these tumor is observed in a more elderly and higher risk population and is mostly considered as an urgent surgery. In contrast to prior reports, no association between HSV infection and occurrence of cardiac myxoma was studied.

C3-9

SINGLE PULMONARY ARTERY IN CONGENITAL HEART DEFECTS: METHODS AND RESULTS OF SURGICAL TREATMENT

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Objectives: to present the experience of surgical treatment of CHD with single (right/left) pulmonary artery (SRPA/SLPA).

Methods: During the years 1983-2007, 38 patients with CHD and SPA (34 with SRPA, 4 with SLPA) were operated on: Thirty with TOF, 4 with VSD and absent PV (APV), 1 with VSD, 1 with ASD, 1 with CAVC, DORV and PS, 1 with aortic valve stenosis (AVS). In all patients the ipsilateral lung was present. Twenty three patients underwent palliative surgery: Blalock-Taussig shunting (8 patients), right ventricular outflow tract (RVOT) obstruction relief without VSD closure (11 patients), balloon pulmonary valvuloplasty (4 patients). The median age during the palliative operation was 3.0 (2.2; 7.0) years. Second/third palliative operations were necessary in five cases because of an inadequate growth of SRPA. Complete repair was done in 29 patients (with SRPA, $n=25$; SLPA, $n=4$): Twenty-two with TOF, 4 with VSD and APV, 1 with VSD and pulmonary hypertension, 1 with ASD, 1 with AVS. The median age during the complete repair was 7.0 (3.0; 9.0) years. Single PA index (SPAI) before complete repair in patients with TOF was $241 \pm 47 \text{ mm}^2/\text{m}^2$, median Z-score of normal Nakata index (NI): -3.0 (-3.7 ; -2.4). In two more patients with SLPA endovascular procedures were carried out: occlusion of PDA and pulmonary angioplasty in patient with SPA stenosis.

Results: Overall hospital mortality was 5.3% (2/38): after palliative surgery - 4.3% (1/23), after complete repair - 3.4% (1/29). Diameter of RVOT after palliative repair without VSD closure was $11.0 \pm 2.4 \text{ mm}$, median Z-score of normal PV diameter was -1.8 (-3.2 ; -1.2), PA systolic pressure was $33.6 \pm 6.9 \text{ mmHg}$. The ratio of systolic pressure in right and left ventricles after complete repair of TOF and VSD with APV was 0.57 ± 0.12 . All patients with Z-score NI equal to -5 or higher survived complete repair of TOF. One of two patients with Z-score NI less than -5 died after complete repair of TOF.

Conclusions: The hospital mortality after surgical treatment of patients with CHD and SPA was low. The majority of patients (14/23) required palliative interventions as a first step of correction. At present the successful complete repair in patients with TOF corresponds to minimal Z-score NI equal to -5 .

April 25th, 2008 2nd Congress Day

14:30-16:00

4th Cardiac Scientific Session - Miscellaneous

C4-1

POTASSIUM CHANNEL-RELATED RELAXATION BY LEVOSIMENDAN IN THE HUMAN INTERNAL MAMMARY ARTERY

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Objectives: Levosimendan is a potent inotropic and vasodilator drug used in the treatment of decompensated heart failure. There is no study on in vitro effects of levosimendan in human isolated arteries.

Methods: We investigated the effect of levosimendan on contractile tone of human isolated internal mammary artery (IMA). The responses in IMA were recorded isometrically by a force-displacement transducer in isolated organ baths. Levosimendan was added to organ baths either at rest or after precontraction with phenylephrine ($1 \mu\text{mol/l}$). Levosimendan-induced relaxations were tested in the presence of cyclooxygenase inhibitor indomethacin ($10 \mu\text{mol/l}$), nitric oxide synthase inhibitor N122-nitro-L-arginine methyl ester ($100 \mu\text{mol/l}$), large-conductance calcium-activated potassium-channel inhibitor tetraethylammonium (1 mmol/l), adenosine triphosphate-sensitive potassium-channel inhibitor glibenclamide ($10 \mu\text{mol/l}$), and voltage-sensitive potassium-channel inhibitor 4-aminopyridine (1 mmol/l).

Results: Levosimendan (10 nmol/l to $3 \mu\text{mol/l}$) produced potent relaxation in human IMA (maximal effect, $75.3 \pm 4.9\%$ of phenylephrine maximum contraction, 6.8 ± 0.1 , $n=15$; $-\log_{10}$ of 50% effective concentration). Vehicle had no significant relaxant effect. The relaxation to levosimendan is not affected by either potassium-channel inhibitors (tetraethylammonium and 4-aminopyridine) or cyclooxygenase and nitric oxide synthase inhibitors. Glibenclamide ($10 \mu\text{mol/l}$) inhibited levosimendan-induced relaxation significantly ($P < 0.01$).

Conclusions: Levosimendan effectively and directly decreases the tone of IMA. The mechanism of levosimendan-induced relaxation in IMA appears in part to be adenosine triphosphate-sensitive potassium-channel opening action. Levosimendan may be a cardiovascular protective agent by its relaxing action on the major arterial graft, IMA.

C4-2

CAROTID ENDARTERECTOMY COMBINED WITH CABG CAN BE DONE WITHOUT AN INCREASE IN POSTOPERATIVE MORBIDITY

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Objectives: Controversy exists whether carotid endarterectomy combined with coronary artery bypass (CABG) results in increased postoperative morbidity compared with isolated CABG. To investigate this issue, we reviewed our experience with patients who had CABG with and without synchronous carotid endarterectomy.

Methods: From 1995 to 2006, 60 patients (10 female) with coronary artery disease and severe ($>80\%$) carotid artery stenosis underwent CABG with cardiopulmonary bypass combined with carotid endarterectomy in our Department. Their age was 67.4 ± 0.9 years ($\pm \text{S.E.M.}$). Ejection fraction was $46.8 \pm 2.2\%$. Six of the patients (10%) had previous CABG. These 60 patients were compared with a matched control group ($n=60$) from our patients without severe carotid disease who had isolated CABG. The patients were matched for age, gender, NYHA class, and major pre-existing morbidity including myocardial infarction, diabetes, stroke and other neurological conditions. Standard CABG and carotid endarterectomy techniques were used. Comparisons were done using the Mann-Whitney (Wilcoxon RankSum) Test for continuous variables, and the Fisher's Exact Test for categorical variables.

Results: There was no difference in ejection fraction, previous CABG, perfusion or aortic crossclamp times, number of coronary bypass grafts, and postoperative hospital stay between groups ($P > 0.05$). There was no operative (30-day) mortality in either group. Postoperative complications in the combined surgery group of patients vs. control (isolated CABG) group occurred as follows: Atrial fibrillation in 13.3% vs. 18.3%; low cardiac output, 1.7% vs. 0; prolonged ($>48 \text{ h}$) ventilation, 5% vs. 5%; perioperative myocardial infarction, 1.7% vs. 0; stroke, 1.7% vs. 5%; coma, 0 vs. 1.7%; other neurological complications, 5% vs. 1.7%; any major complication, 23.3% vs. 31.7%, respectively. There was no difference in complications between groups ($P > 0.2$).

Conclusions: Carotid endarterectomy can be performed in combination with CABG without increasing the operative morbidity and mortality.

C4-3

ABDOMINAL AORTIC ANEURYSM AND COEXISTENT ARTERIAL LESIONS: RESULTS OF STAGED AND SIMULTANEOUS SURGICAL REPAIR

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Objectives: To evaluate the results of surgical treatment of abdominal aortic aneurysm (AAA) and concomitant arterial lesions.

Methods: There were 173 consecutive patients who underwent AAA surgical repair. There were 153 (89%) men and 20 (11%) women with a mean age of 63.4 ± 8.4 years (range 23-87). Ninety-six percent of the cases were elective and 4% - urgent admissions. An extensive preoperative examination was included ultrasound duplex scanning, angiography, CT and MRI. The location of AAA was infrarenal (87.8%), juxtarenal (9.8%) and suprarenal (2.3%). Aneurysms ranged in size from 37 to 164 mm with a mean diameter of $70.8 \pm 26.2 \text{ mm}$. The operative approach in cases of infrarenal AAA was laparotomy, in more proximal aneurysms - extended left flank extraperitoneal exposure. In addition, patients with significant lesions of coronary, carotid and renal arteries underwent myocardial revascularization, carotid endarterectomy and renal artery reconstruction, respectively. The operations on abdominal aorta, coronary and carotid arteries were conducted either separately in two stages (19.0%) or simultaneously as one-stage procedure (10.4%) depending on haemodynamical significance of concurrent arterial lesions and type of the aneurysm. The incidence of concurrent coronary artery disease and carotid artery lesion was 90.1% and 73.9%, respectively. Associated essential hypertension was found in 26.5% of cases and chronic obstructive pulmonary disease in 8.7% of patients. Renal artery stenosis were detected in 42.7% and 21.9% of cases, respectively. Coexisting lesions of three arterial regions (coronary, carotid and renal arteries) were observed in 12.1% and lesions of four arterial regions (coronary, carotid, renal and lower limb arteries) in 6.9% of cases. Occlusive and aneurysmal lesions of iliac arteries were found in 29.4% of patients.

Results: In cases of correctable coronary artery disease AAA repair was added by CABG (26.4%) or PTCA (6.8%). 19.4% of patients with significant

carotid stenosis underwent carotid endarterectomy. Simultaneous iliac and renal artery reconstructions were performed in 29.4% and 6.8% of cases, respectively. Staged operations in cases of coexistent coronary and carotid lesions were performed correspondingly five and 2.5 times more frequently than simultaneous repairs. The overall in-hospital morbidity and mortality comprised 16.7% and 3.4%, respectively. Mortality following staged repair was 2%. There was no postoperative death following simultaneous reconstructions.

Conclusions: The management of AAA and coexistent arterial lesions includes either staged or simultaneous repair. The choice of surgical strategy depends on the haemodynamical significance of concomitant arterial lesions. The results of staged and simultaneous repair of AAA and coexistent arterial lesions are satisfactory.

C4-4 CAROTID ARTERY STENTING IN PATIENTS UNDERGOING SYNCHRONOUS CARDIAC SURGERY

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Objectives: perioperative stroke rate in patients with carotid artery disease undergoing cardiac surgery is 10% when stenoses are 50-80% and 11-19% in stenoses >80%. Patients with untreated bilateral carotid disease have a 20% rate of stroke. The staged procedure of carotid revascularization followed by CABG has lower stroke risk but higher incidence of myocardial events. The staged procedure of CABG followed by carotid artery revascularization has higher incidence of cerebrovascular complications and fewer cardiac events. Synchronous procedures have medium incidence of both complications. In those patients optimal treatment remain controversial. Carotid artery stenting (CAS) in the past few years have demonstrated, especially in high-risk patients, to be a valid alternative to carotid endarterectomy (CEA). Transcervical carotid stenting reduces periprocedural thromboembolic complications, avoiding the aortic arch instrumentation. We report the results of a prospective study designed to evaluate the feasibility, safety and benefits in a reduction of neurological perioperative events in patients undergoing carotid artery stenting synchronous coronary artery bypass or combined bypass and valve replacement.

Methods: From March 2003 to December 2007 a total of 22 patients were included (14 male; 8 female). The mean patients age was 70.6±7 years. The procedural success rate of CAS was 100%. Transfemoral approach was performed in 10 cases, a transcervical approach in 12 cases, with a mini-incision at the base of the neck to access at the common carotid artery. In 16 (72.7%) cases a CABG was performed after CAS, in 4 (18%) cases the CABG were associated with aortic valve replacement and in 2 (9%) with mitral valve replacement. All patients underwent general anesthesia, and a transcranial Doppler monitoring was performed during all the procedure.

Results: Two (9%) patient had a minor stroke, in one case it was ipsilateral, in the other it was contralateral. Both of them had bilateral carotid stenosis and the one with contralateral minor stroke underwent to valve replacement too. One (4.5%) patient had a major contralateral stroke after CAS, CABG and valve replacement. None of the patients that underwent CAS and CABG had myocardial or cerebral events. There were no deaths.

Conclusions: Patients that need valve replacement associated with carotid and cardiac revascularization have an higher risk to develop cerebral ischemia compared to those that underwent CAS with CABG. Patients with hemodynamically carotid artery stenosis can undergo synchronous CAS/CABG with a low morbidity and mortality rates.

C4-5 INTERPLEURAL VS. EPIDURAL ANALGESIA WITH ROPIVACAINE FOR POSTTHORACOTOMY PAIN AND RESPIRATORY FUNCTION

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Objectives: To evaluate the impact of interpleural analgesia (IP) on post-thoracotomy pain and respiratory function as an alternative to thoracic epidural analgesia (TEA).

Methods: Design: prospective, randomized study. Setting: tertiary-care military hospital. Patients: sixty young patients scheduled for elective thoracic surgery (correction of aorta coarctation and patent ductus arteriosus). Interventions: patients were randomized into two groups to receive either

IP or TEA for postthoracotomy pain management. Measurements: patients in the IP group (n=30) had a catheter inserted between the parietal and visceral pleura by a surgeon, and 0.2% ropivacaine was given through this catheter. In the TEA group, ropivacaine was administered through a thoracic epidural catheter. The impact of both methods on pain control, respiratory function, and pulmonary complications was analyzed and compared.

Results: The frequency of atelectasis and pleural effusion was also significantly high in the IP group (P<0.01). Respiratory function and postoperative pain scores were better in the TEA group (P<0.01). Arterial blood gas analysis on the fifth postoperative day was significantly better in the TEA group.

Conclusions: Thoracic epidural analgesia has more beneficial effects on respiratory function and postoperative pain after thoracotomy than does IP.

C4-6 SURGICAL TREATMENT OF CHRONIC CONSTRICTIVE PERICARDITIS, IS TUBERCULOSIS STILL A COMMON CAUSE?

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Objectives: Constrictive pericarditis (CP) demonstrates a heterogenous pattern and has different aetiologies depending on the geographic areas reporting it. Today in the western hemisphere radiation and previous cardiac surgery have become important causes of CP, but it seems that Tuberculosis is still a common cause of CP in the developing countries.

Methods: We reviewed the records of 45 patients with the diagnosis of CP who underwent pericardiectomy between 1994 to 2006. The mean age was 46.6 year (21-84 year) Preoperatively 4.5% were in New York Heart Association (NYHA) Class I, 45.5% in class II, 47.7% in class III and 2.3% in class IV. Pericardial calcification was seen in 21% of plain chest X-rays. The mean follow-up period was 40±18 months (3-144 months).

Results: Postoperatively only 15.6% of patients were in NYHA class III and the others were in class I (18.2%) or II (66.2%), (P<0.001). The etiologic factors were Tuberculosis in 22.2%, chronic renal failure in 8.8%, post-sternotomy in 4.5% and malignancies in 4.5%. The cause of CP was idiopathic in 60%. Low output state was the most common postoperative problem (22.3%). The overall mortality was 4.4%. There was one in-hospital death due to respiratory insufficiency in a tuberculosis patient and one patient died due to metastatic adenocarcinoma during follow-up period.

Conclusions: We conclude that the tuberculosis despite vaccination programs and anti-tubercular medications is still an important cause of chronic CP at least in our area. Pericardiectomy is an effective treatment of chronic CP because it provides an important and durable improvement in symptoms and functional status with low mortality.

C4-7 POTASSIUM CHANNEL-RELATED RELAXATION BY LEVOSIMENDAN IN THE HUMAN INTERNAL MAMMARY ARTERY

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Objectives: Levosimendan is a potent inotropic and vasodilator drug used in the treatment of decompensated heart failure. There is no study on in vitro effects of levosimendan in human isolated arteries.

Methods: We investigated the effect of levosimendan on contractile tone of human isolated internal mammary artery (IMA). The responses in IMA were recorded isometrically by a force-displacement transducer in isolated organ baths. Levosimendan was added to organ baths either at rest or after precontraction with phenylephrine (1 µmol/l). Levosimendan-induced relaxations were tested in the presence of cyclooxygenase inhibitor indomethacin (10 µmol/l), nitric oxide synthase inhibitor N122-nitro-L-arginine methyl ester (100 µmol/l), large-conductance calcium-activated potassium-channel inhibitor tetraethylammonium (1 mmol/l), adenosine triphosphate-sensitive potassium-channel inhibitor glibenclamide (10 µmol/l), and voltage-sensitive potassium-channel inhibitor 4-aminopyridine (1 mmol/l).

Results: Levosimendan (10 nmol/l to 3 µmol/l) produced potent relaxation in human IMA (maximal effect, 75.3%±4.9% of phenylephrine maximum contraction, 6.8±0.1, n=15; -log₁₀ of 50% effective concentration). Vehicle had no significant relaxant effect. The relaxation to levosimendan is not affected by either potassium-channel inhibitors (tetraethylammonium and 4-aminopyridine) or cyclooxygenase and nitric oxide synthase inhibitors. Glibenclamide (10 µmol/l) inhibited levosimendan-induced relaxation significantly (P<0.01).

Conclusions: Levosimendan effectively and directly decreases the tone of IMA. The mechanism of levosimendan-induced relaxation in IMA appears in part to be adenosine triphosphate-sensitive potassium-channel opening action. Levosimendan may be a cardiovascular protective agent by its relaxing action on the major arterial graft, IMA.

C4-8 BRAIN NATRIURETIC PEPTIDE A WORTHY PREDICTIVE MARKER IN CARDIAC SURGERY

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Objectives: BNP which stands for brain natriuretic peptide is a cardiac neurohormone and is secreted in response to myocardial stress and causes natriuresis and vasodilatation. Some studies have reported close correlation between the high concentration of BNP in blood and worse short-term and long-term prognosis post myocardial infarction and heart failure. In this study we have tested its usefulness and predictive value in the outcome, post cardiac surgery.

Methods: Between March 2006 to June 2007, 141 patients, undergoing cardiac surgery, were enrolled in this study. Their BNP concentration was measured prior to the operation and their co-morbidities were examined against their BNP level. Postoperatively their outcome was closely monitored. Main clinical end points were; atrial fibrillation; inotropic use, renal impairment, early deaths, ICU and hospital stay. Comparative descriptive tests and Spearman rank were used for analysis. A $P < 0.05$ was considered to be statistically significant.

Results: Some preoperative co-morbidities, such as; renal impairment, peripheral vascular disease and low ejection fraction were associated with higher BNP concentration. Statistically EuroSCORE and parsonnet score, showed significant correlation with preoperative BNP concentration ($P < 0.001$). High BNP concentration, also predicted inotropic requirement, higher than the baseline creatinine concentration post operatively, longer ventilation time, and longer ICU and hospital stay ($P < 0.05$) but our study did not reveal any predictive value for BNP and developing AF or wound infection.

Conclusions: BNP is a valuable biochemical marker, which is easy to measure and can be beneficial in predicting the operative outcome.

C4-9 CARDIAC SURGERY AFTER STENT ANGIOPLASTY: A NEW CHALLENGE FOR THE SURGEON!

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Objectives: The number of patients receiving coronary stent angioplasty is still increasing. And some cardiologists are of the opinion that coronary artery surgery will be unnecessary in some years. However, with the increasing number of stent angioplasties the number of patients with a need for coronary artery surgery after these procedures is also increasing. Especially in patients a short time after angioplasty or patients who received drug eluting stents the hemostasis is one of the major problems in surgery. There are also a number of patients entering the operation room under unstable conditions due to acute stent thrombosis or complications in the catheter laboratory.

Methods: All our patients from 2004 and 2005, who underwent coronary artery bypass grafting following coronary angioplasty within a period of six months were investigated ($n=124$). Several items as the number of vessels diseased, localisation of stents, preoperative medication (especially clopidogrel and aspirin), amount of blood loss, need for transfusion, length of stay in ICU and in hospital and 30-day-mortality were compared to all other patients that underwent coronary artery bypass grafting during this period ($n=1730$).

Results: The majority ($n=83$; 67%) of the angioplasty collective suffered from three-vessel-disease. 75.8% ($n=94$) needed emergency revascularisation. Consumption of clopidogrel and aspirin, blood loss, need for transfusion (1.7 vs. 0.77 units transfused per patient), cardiogenic shock and length of stay in ICU (3.6 vs. 2.6 days) and hospital (15 vs. 9.0 days) were significantly higher than in the control group. There was even an increasing number of patients after angioplasty ($n=55$ in 2004 vs. $n=69$ in 2005). In one case a fatal myocardial infarction following acute stent thrombosis required implantation of a ventricular assist device. Nevertheless no increase in mortality could be observed.

Conclusions: The big number of patients with three-vessel-diseases shows that these patients should have received coronary artery bypass surgery in the first place. This is also according to the guidelines. At least a discussion between cardiologist and surgeon should have been held before stent angioplasty. It is also most important to keep the connection with the cardiologist running in order to discuss the greater risks for the patients. Especially the increasing number of patients with clopidogrel medication implicates a better management and analysis of hemostasis during the surgery. Despite the risk there is also the problem of increasing consumption of resources and costs in this collective.

April 25th, 2008 2nd Congress Day 14:30-16:00 1st Vascular Scientific Session - EVAR

V1-1 EFFECT OF EVAR WITH TRF AND IRF ON RENAL FUNCTION COMPARED TO OPEN REPAIR: RESULTS OF A PROSPECTIVE COMPARATIVE STUDY

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Objectives: Recent studies have shown that progressive renal dysfunction may develop in patients after EVAR, data are conflicting about the effect of EVAR on renal function compared with open repair (OR). The purpose of this prospective study was to assess the effects of EVAR both with TRF and infrarenal fixation (IRF) vs. OR on renal function detected with serum creatinine (SCr), creatinine clearance (CrCl) and renal perfusion scintigraphy (RPS) and to compare them with OR.

Methods: A prospective comparative study was carried out at the Department of Vascular and Endovascular Surgery - University of Padua, from January 2003 to June 2006. To assess renal function a RPS, SCr, CrCl (estimated with the Cockcroft-Gault) were performed preoperatively and in the 4th post operative day. A postoperative change $>20\%$ of SCr, CrCl or of the glomerular filtration rate (GFR) at the RPS was considered significant for renal dysfunction. The follow-up included: dosage of SCr, CrCl, Duplex scan of renal artery and angio-CT at 6, 12 months and than yearly. Patients with a preoperative SCr >2.5 mg/dl were excluded.

Results: The patients enrolled in the study were 320; 111 underwent EVAR; 57 (51.3%) received a TRF and 54 (48.7%) a IRF; 209 underwent open repair. No significant change were observed for SCr, CrCl from the preoperative to the postoperative period (4th day) in both EVAR groups. A significant reduction of the GFR at the RPS was observed in 9 patients (8.1%), 5 (8.8%) from the TRF group and 4 (7.4%) from the IRF group in absence of relevant variation of SCr and CrCl. In five patients (4.5%; 3 TRF, 2 IRF) the decrease was limited to a single kidney. No difference emerged by comparing preoperative and postoperative SCr and CrCl, between EVAR group and OR. During the follow-up (mean 26 months, range 12-54), a slight and progressive decline of renal function was observed in EVAR group differently in OR group renal function improved (Fig. 1). No sign of renal artery occlusion or renal infarction was observed at the angio-CT and renal artery Duplex scan.

Conclusions: An early decrease of renal function is seen after EVAR at the RPS in 8.8% of patients, regardless of fixation level. Long-term results showed a slight worsening of renal function in EVAR group and by contrast an improvement in OR; this result must be considering in selecting patients for this procedure.

V1-2 WHY SHOULD THE POWERLINK DEVICE BE THE ENDOGRAFT OF CHOICE FOR SHORT AND ANGULATED NECKS?

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Objectives: Endovascular aortic aneurysm repair (EVAR) is now being evaluated as an alternative to surgical repair for treatment of anatomy suitable infrarenal abdominal aortic aneurysms (AAAs) and is becoming accepted as gold standard.

Methods: The successful treatment is to place an endoluminal exclusion channel to prevent rupture of the aneurysm without mid and long-term adverse events. The essence of this technique is to build an endoluminal exclusion system with strong fixation (stability) of the endograft and complete exclusion (seal) of the aneurysm sac. The Endologix Powerlink endograft (Irvine, CA, USA) is a unibody fully supported bifurcated device which can be implanted sitting on the aortic bifurcation - anatomical fixation on the abdominal aortic bifurcation, this has been proven by our single center seven year experience to be the best way of eradicating distal migration of the endografts. Building upon the foundation of the bifurcated endograft, a suprarenal or infrarenal proximal cuff with a long overlapping segment inside the bifurcated mainbody endograft (for prevention of type III endoleak) is built up to the renal artery level, thus providing a stable endoluminal exclusion system. Normally, a good seal can be achieved by balloon angioplasty in the neck. If not, a Palmaz stent can be used to achieve proximal seal. Accordingly, with a quite different philosophy from the other devices, the Endologix Powerlink endograft with fixation on the aortic bifurcation is best for most AAAs.

Results: Our EVAR experience has proved that the Powerlink device is good for morphology challenging AAAs with flared necks. Theoretically and practically, the Endologix Powerlink device is good for most of the challenging AAAs, and we are using it for cases with short and angulated necks, thrombus affiliated necks, calcified necks and flared necks. When can it not be used. Our experience of more than 450 cases has shown only two situations: the first is the limitation of the delivery access which is very narrow or severely tortuous, the second is the limitation of the neck diameter which is more than 25 mm, as the larger angioplasty balloon for Palmaz stent is not yet commercially available. However, these limitations apply for all endovascular devices.

Conclusions: The Endologix Powerlink endograft with fixation on the aortic bifurcation has been proven best for most AAAs, and it is also good for many challenging cases like flared necks. The larger diameter of the neck may be a limitation of the application of this device.

V1-3

DUPLEX ULTRASOUND IMAGING WITH AN ULTRASOUND CONTRAST AGENT: THE ALTERNATIVE TO CT ANGIOGRAPHY FOR AORTIC STENT GRAFT SURVEILLANCE

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Objectives: To systematically review the findings of the use of contrast-enhanced ultrasound scan (CUS) and to determine its value as an alternative to computed tomographic angiography scan (CTA) in the follow-up after endovascular repair of abdominal aortic aneurysm.

Methods: A search of PubMed and Medline databases for English-language literature was performed to find studies published between 1997 and 2007. Studies comparing the diagnostic accuracy of contrast enhanced ultrasound with that of computed tomographic angiography were included, and analysis was performed to value of the detection of endoleaks and follow-up in endovascular aneurysm repair.

Results: Eight studies met the criteria and were included for analysis. A total of 293 (ranging between 20-102 for each study) patients underwent paired scans (ranging between 20-96) in two studies they were not specified (NS). All studies used a spiral CTA, six biphasic (an arterial and a delayed scan), one uniphasic (only arterial scan) and was one not specified. The CUS scan was performed using first (in 6 studies) and second (in 1 study) generation contrast agent, in six studies contrast agent was applied in bolus form (0.5-2.4 ml) and one by continuous saline dissolved solution. The inhomogeneous group of studies makes it impossible to calculate a pooled estimate of sensitivity, specificity, positive and negative predicted value for endoleak detection. Most articles stated a high false positive number of endoleaks compared to the CTA, yet many question these as rather 'true positive' caused by failure of CTA to detect them. Some studies mentioned CUS to be more sensitive to the detection of slow-flowing endoleaks due to its superior contrast resolution on delayed imaging. The added value of CUS is a higher sensitivity in specifying the type of endoleak as well as the information of hemodynamic characteristics.

Conclusions: This systematic review shows a consistent bias in the studies by defining the CTA as the gold standard for detection of an endoleak. Another bias is the mathematical coupling caused by retrospectively redefining the gold standard as the outcome of the studied CTA and CUS scan. These biases call upon a large randomised prospective trial with

clear definition and imaging protocol to determine the specific sensitivity, specificity, positive and negative predicted value for endoleak detection. Together with the substantial lower cost and the radiation, nephrotoxic and anaphylactic reduction CUS and plain X-ray should be considered as a possible candidate in becoming the 'gold standard' protocol for follow-up in EVAR.

V1-4

POST ENDOVASCULAR ANEURYSM REPAIR SURVEILLANCE: HOW DOES DUPLEX COMPARE WITH COMPUTED TOMOGRAPHY

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Objectives: The purpose of this study was to evaluate the efficacy of duplex ultrasound (DUS) compared to computed tomography (CT), which is considered to be the gold standard for surveillance of patients post endovascular abdominal aortic aneurysm repair (EVAR), at a single centre.

Methods: Eighty patients [57 males, mean age 74.7 years (range 51-91)] underwent infra-renal EVAR from August 2003 to August 2007. Follow-up was performed with paired CT and DUS scans (within eight weeks of each other) pre-discharge; at 3, 6, 12 months post-discharge and yearly thereafter. Sensitivity, specificity, positive and negative predictive value of DUS was compared to CT for detecting endoleaks. Accuracy in assessing change in aneurysm sac size was also evaluated.

Results: Paired CT and DUS scans were obtained in 112 instances. CT identified 16 endoleaks in 15 patients (5 type 1, 8 type 2 and 3 of uncertain origin). Of these, DUS identified 10 endoleaks (4 type 1, 4 type 2 and 2 of uncertain origin). DUS identified an additional 13 endoleaks in 12 patients (3 type 1, 8 type 2 and 2 of uncertain origin). Compared to CT, DUS had a sensitivity of 62.5%, specificity of 86.3%, positive predictive value of 43.5% and negative predictive value of 93.6%. Of the five type 1 endoleaks detected on CT, one resolved spontaneously. The remaining four requiring intervention were also detected by DUS. The additional three type 1 endoleaks detected only by DUS, resolved spontaneously. Statistical analysis performed using the Mann-Whitney *U*-test, found no significant difference in assessing change in aneurysm sac size by either modality ($P=0.87$).

Conclusions: Although less specific and sensitive than CT in detecting endoleaks, DUS detected all endoleaks requiring intervention. DUS could form an integral part of a surveillance programme for patients post EVAR.

V1-5

ENDOVASCULAR TREATMENT OF ABDOMINAL AORTIC ANEURYSM IN PATIENTS AFTER KIDNEY TRANSPLANTATION

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Objectives: Improved long-term survival of kidney transplant recipients contributed to increase number of incidence of abdominal aortic aneurysm (AAA) in this group of patients. Open aneurysmectomy is technically difficult and burdened with high risk of ischemic injury to transplanted kidney upon cessation of aortic blood flow. The aim of the study was to present results of endovascular AAA exclusion by stentgraft implantation in patients after kidney transplantation.

Methods: In our Department since 1998, 593 patients with AAA were treated endovascularly. In this group eight (1.34%) were kidney transplant recipients. Time between kidney transplantation and AAA management was from 3 to 19 years. In five patients grafts renal artery was anastomosed in end-to-end fashion to hypogastric artery, in remaining patients end-to-side to external iliac artery. Aneurysm diameter were 50-76 mm. Commercial bifurcated stentgrafts were used (Zenith, Excluder and PowerLink). All procedures were performed under epidural anaesthesia. All patients were followed-up with CT-scan performed postoperatively, in 3-rd, 6-th, 12-th month and annually thereafter according to Eurostar protocol. Kidney function was assessed two times a year.

Results: Successful AAA exclusion (without any endoleak) and preserved flow to transplanted kidney was confirmed on completion angiogram in all patients. Temporary deterioration of transplanted kidney function was observed in two patients, one of them required transient haemodialysis. In follow-up there was one stentgraft limb thrombosis contralaterally to transplanted kidney in 9th month after stentgraft implantation that required

femoro-femoral bypass. In one patient there was endoleak type I treated successfully with proximal extension. The mean observation period was 33 months (range 9-68 months).

Conclusions: Endovascular treatment of AAA in kidney transplant recipients is safe and effective method and can be performed without serious impairment of graft function.

V1-6

ENDOVASCULAR TREATMENT OF RUPTURED ABDOMINAL AORTIC ANEURYSMS: 3 YEARS EXPERIENCE

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Objectives: To report our early experience with endovascular treatment of patients with ruptured abdominal aortic aneurysms.

Methods: Between January 2005 and September 2007, 90 patients with a ruptured abdominal aortic aneurysms presented to our Unit. All hemodynamically unstable patients (systolic blood pressure <80 mmHg) were transferred directly to the operating room for open repair. The hemodynamically stable patients underwent computed tomography angiography to evaluate anatomic suitability for emergency endovascular treatment (EVAR). Twenty-two patients (21 males; 1 female; mean age: 78.8 years) underwent EVAR procedure. A total of 20 bifurcated and two aortouniliac stent grafts were implanted. The mean dose of contrast medium was 140 ml.

Results: Overall successful graft deployment was 100%. The 30-day mortality was 14% (3/22 patients); two patients died from cardiac causes and one patient developed a multiple organ failure. There were no postoperative reinterventions. Patients underwent computed tomography angiography scan at 1, 6, 12 months and yearly (Eurostar protocol). The mean follow-up is 192.6 days (range: 90-540 days); the overall mortality rate was 23% (5/22). We observed no type I and III endoleaks and two cases of type II endoleak (9%).

Conclusions: Endovascular treatment of ruptured abdominal aortic aneurysms is feasible and the early experience is promising.

V1-7

EVAR: EARLY AND MID-TERM RESULTS IN 101 PATIENTS

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Objectives: The purpose of this study was to assess the effectiveness of EVAR at our institution.

Methods: Between January 2002 and December 2007, 244 consecutive patients underwent elective treatment of an infrarenal aorto iliac aneurysm; 145 with open repair and 101 with EVAR. An adequate morphology of the proximal aortic neck determined by CT-scan and routine preoperative angiography was the main criterion used to select the patients for EVAR. All EVAR were performed in the operating room under general anesthesia through surgically exposed femoral arteries. Postoperatively all the patients underwent contrast enhanced ct scans before discharge, then at 1, 3, 6, 12, 18, 24 months and yearly thereafter.

Results: The demographic data of the 101 patients are as follows: mens: 96, womens: 5, mean age: 68 years, CAD: 50 patients, hypertension: 52 patients, diabetes: 10 patients, stroke/TIA: 14 patients, severe obesity: eight patients, COPD: 17 patients, renal insufficiency: two patients previous laparotomy: 23 patients EVAR was successfully performed in 99 patients. There were two conversions to open surgery because of failure access. Ninety-eight bifurcated and one aortouniliac endo grafts were implanted. Sixteen patients required additional procedures including coil embolization of one hypogastric artery (10 patients), femoro femoral bypass (1 patients), thromboendarterectomy of the common femoral artery (4 patients), and balloon angioplasty of a renal artery (1 patient). Mean operative time was 116 min. There was no perioperative death and none of the patients required blood replacement. Mean postoperative length of stay was five days. A rupture occurred on postoperative day eight in a patient who had no endoleak on the angiogram obtained after completion of the EVAR. This patient was successfully treated with placement of an iliac extension. Three patients required also an early reoperation for groin complications (lymphocele 2, skin necrosis 1). Mean follow-up is 23 months. There were

six late deaths (traffic accident 1, Alzheimer's disease 1, mesenteric infarction 1, and cardiac failure 2). There were one graft occlusion treated with femoro femoral bypass and three stenoses treated with balloon angioplasty and placement of a new stent. Three endoleaks type I b were detected in two patients 6.22 and 26 months postoperatively and were treated with placement of iliac extensions Expansion of the diameter of the aneurysmal sac with no demonstrated endoleak occurred in one patient who was treated with placement of a new bifurcated aortoiliac endograft 48 months after the previous EVAR. A significant reduction of the aneurysmal sac was noted in 52 patients and no change was noted in the 45 others.

Conclusions: Our results suggest that EVAR can be performed in almost half the patients with an infrarenal aorto iliac aneurysm with an acceptable rate of early and mid-term complications.

V1-8

ENDOVASCULAR TREATMENT OF ABDOMINAL AORTIC ANEURYSM IN PATIENTS WITH HIGH OPERATIVE RISK

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Objectives: Since the endovascular treatment of abdominal aortic aneurysm was described, this type of operation became the method of choice in patients with high perioperative risk. The aim of this study was to estimate the outcome of endovascular treatment of infrarenal abdominal aorta aneurysm in patients with high perioperative risk.

Methods: From April 1998 to January 2008, 593 patients with abdominal aortic aneurysm were treated by means of stentgraft in our Department. The aneurysm diameter was from 42 to 110 mm. Operative risk was estimated in ASA scale and SVS-ISVS scale. We evaluated 453 patients more than grade II in ASA scale, considered high perioperative risk. Three hundred and eighteen (70.2%) were classified as ASA III and 135 (29.8%) - ASA IV. The age ranged from 47 to 91 years, 42 patients were older than 80. Severe ischemic heart disease was stated in 420 (82.7%) patients, 323 (71.3%) of them had myocardial infarction in the past, in 55 (12.1%) the ejection fraction was <40%. Arterial hypertension occurred in 432 (95.3%). Chronic obstructive pulmonary disease was confirmed in 178 (39.3%) patients. Spiral CT-scan was used for preoperative evaluation and postoperative follow-up, performed according to Eurostar registry protocol. Four hundred and twenty-one (94.6%) of operations were performed under regional anesthesia. In 27 cases general and in five local anesthesia were used.

Results: The technical success was achieved in 447 patients (98.7%). In six patients (1.3%) early conversion to open aneurysmectomy was necessary. Eight-one (17.9%) patients required reintervention because of endoleaks. Three patients required aneurysm sac opening and ligation of endoleak. There was no aneurysm rupture in early postoperative period. The rupture of four aneurysms occurred over one year after EVAR. Perioperative mortality occurred in 19 patients (4.2%). Pulmonary insufficiency occurred in six patients (1.3%) operated in general anesthesia. They required controlled ventilation up to 16 h after the operation. Impaired renal function with the rise of creatinine level over 1.5 mg percent occurred in 25 (5.5%) patients. Three (0.7%) of them required transient, 6 (1.3%) permanent dialysis.

Conclusions: We have shown EVAR to be feasible, durable, and safe option for patients with several comorbidities. The procedure is currently performed with low in-hospital mortality, even in patients with the highest risk.

V1-9

ANEURYSM REPAIR AND RENAL FUNCTION: IS THERE A DIFFERENCE BETWEEN OPEN AND ENDOVASCULAR REPAIR?

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Objectives: This study aims to quantify the incidence of renal impairment in patients post EVAR and compare it with open surgery.

Methods: One hundred and thirty-two patients underwent elective repair of infra-renal abdominal aortic aneurysms at our institution from January 2003 to October 2007. Seventy-three patients underwent EVAR and 59 underwent open repair. Serum creatinine levels were recorded preoperatively, immediately postoperatively and one year post surgery. Renal impairment was classified as mild, moderate and severe using glomerular filtration rates,

calculated by the 4-variable MDRD (modification of diet in renal disease) method. All patients with pre-existing renal impairment were given N-acetylcysteine and re-hydration preoperatively. Both groups were comparable for gender [EVAR - 55 men, open - 50 men], age [EVAR - mean age 73.9 (range 59-90), open - mean age 71.2 (range 44-85)] and ASA grade [EVAR - mean 3.3 (range 2-4), open - mean 2.8 (range 2-4)]. Pre existing renal impairment was detected in 41 patients in the EVAR group (40 mild, 1 moderate) and 23 patients in the open group (21 mild, 1 moderate, 1 severe). Statistical analysis was performed using the paired *t*-test.

Results: There were 8/73 (11%) new cases of renal impairment in the EVAR group and 12/59 (20.3%) new cases in the open group. In addition, one patient in each group had progressed from moderate to severe renal impairment at one year follow-up. In all, 9/73 (12.3%) patients in the EVAR group and 13/59 (22%) in the open group experienced deterioration in renal function. Statistical analysis performed revealed no significant difference in the creatinine levels in both groups either preoperatively and immediately postoperatively (EVAR *P*=0.3, open *P*=0.7) or preoperatively and one year post surgery (EVAR *P*=0.5, open *P*=0.9).

Conclusions: Our results do not suggest an increased incidence of renal impairment post EVAR as compared to open surgery.

April 25th, 2008 2nd Congress Day 14:30-16:00 2nd Vascular Scientific Session - Cerebrovascular Insufficiency

V2-1

EVALUATION OF CARDIAC TROPONIN I LEVELS AND CORRELATION WITH EARLY AND LATE CARDIAC AND NEUROLOGIC COMPLICATION AFTER CAROTID REVASCULARIZATION WITH TRADITIONAL OR ENDOVASCULAR SURGERY

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Objectives: When compared with carotid endarterectomy (CEA), percutaneous carotid angioplasty with stent replacement (CAS) is a less invasive technique in the treatment of carotid stenosis. However, periprocedural hemodynamic instability still remains a challenge. This instability might lead to myocardial damage, which is now measured accurately by using cardiac troponin I (CTnI). The purpose of this report is also to compare cardiac and neurological early and late outcomes in symptomatic and asymptomatic patients treated with CAS and carotid endarterectomy (CEA).

Methods: From September 2004 to September 2006, 513 consecutive patients underwent to elective carotid revascularization through CAS or CEA and have been included respectively in the study: 415 patients underwent to CEA (80.9%) while 98 underwent to CAS (19.1%). All patients have been evaluated CTnI preoperative, postoperative, and in days 1, 2, 3. The follow-up in the long-term has been carried out through one systematic clinical review of the patients from 1 month to 12 months. End point the clinicians were major and minor neurological and cardiac events.

Results: An increased level of CTnI (>0.5 ng/ml) has been found with the same frequency and without statistically difference in the patients who underwent to CEA (19 ps: 4.58%) and also in the patients who underwent to CAS (4 ps: 4.08%). Also separately analyzing to cardiologic major events (1.93% CEA vs. 1.02% CAS) and minors (2.65% CEA vs. 3.06% CAS) the values are the same about. None have been cases of cardiac death. No correlation has been found between periprocedural hemodynamic instability and increase of the levels of the troponina. Analyzing only the patients with preoperative heart disease we have had the same percentage as far as the major and minor cardiologic events. Instead the percentage of neurological events was higher in subgroup of patients with preoperative heart disease and who underwent to CAS: all the neurological events of group CAS occurred in the subgroup of patients with previous cardiologic heart disease.

Conclusions: The increase in the levels of CTnI is an objective measure of ischemic lesion of the heart and a sure preannouncer of the cardiac morbidity in the postoperative periods and in the mid-term. The advantage in the employment of the CAS is, above all, in the total reduction of the cardiologic complications between the patients with high clinical comorbidity also con-

sidering an increased risk of neurological complications in the patients with previous cardiomyopathy. This increased risk comes, however, reorganized if the CAS is conceived not like an alternative intervention but like a complementary intervention to the CEA.

V2-2

VERY EARLY SURGICAL TREATMENT OF ACUTE CEREBRAL ISCHEMIA: ON-GOING RESULTS OF THE ITALIAN REGISTRY (S.T.A.C.I.)

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Objectives: Reviews on prospective randomized trial on carotid endarterectomy (CEA) on symptomatic patients definitely showed that operation performed within two weeks from symptoms gives benefit in terms of prevention of early recurrent stroke. A published Italian Registry on early CEA after stroke demonstrated its safety and feasibility. This registry continued after publication and the number of cases recruited doubled within one year. The aim of this paper is the presentation of the results of the complete registry.

Methods: The neurologists, neuroradiologists and vascular surgeons on duty in emergency departments enrolled 179 patients who underwent very early CEA according to a predefined protocol within three years. The protocol included evaluation of neurological status by National Institute of Health Stroke Scale (NIHSS), neuroimaging assessment, ultrasound of the carotid arteries and Transcranial Doppler. Patients with NIHSS>22 and with neuroimaging showing brain infarct >2/3 of the middle cerebral artery territory were excluded. All eligible patients underwent CEA as soon as possible. Primary end points of the study were mortality, neurological morbidity and postoperative hemorrhagic conversion on neuroimaging.

Results: The mean time elapsing between the onset of stroke and endarterectomy was 1.5 days (±2 days). The overall 30-day morbidity mortality rate was 4% (7/179). No neurological mortality occurred. On hospital discharge, three patients (1.6%) experienced worsening of the neurological deficit (NIHSS score 1-2, 1-3 and 9-10, respectively). At hospital discharge 12/179 patients (6.7%) had no improvement in NIHSS scores, 89 (50%) were asymptomatic and 75 (42%) showed a median decrease of 3 NIHSS points (range 1-20).

Conclusions: The further enrolment of patients confirmed that this protocol properly select the patients who can safely undergo surgery soon after (1, 5 days) acute brain ischemia. In this subset of patients such a short elapse of time from surgery warrant the best secondary prevention of the risk of early recurrent stroke. This risk is much higher than it was previously accepted as a recent prospective observational study reported (recurrent stroke rate 8-12% within seven days). However, large randomized multicenter prospective trial are warranted to compare very early CEA vs. best medical therapy.

V2-3

COMPARISON BETWEEN SIMULTANEOUS AND STAGED BILATERAL CAROTID ENDARTERECTOMY. OUR EXPERIENCE

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Objectives: Aim of this study is to report our experience after simultaneous and staged bilateral carotid endarterectomy.

Methods: Between 1996 and 2007, a total of 2121 patients were treated for symptomatic and for high grade asymptomatic carotid stenosis. In 105 cases stenosis involved both carotid bifurcations and therefore, simultaneous or staged bilateral endarterectomy was performed. In order to compare the results between the above mentioned procedures, 42 bilateral consequent carotid stenosis were considered and were subdivided into two groups: the first included 21 patients treated simultaneously (SBCS) whereas the second one included 21 cases of staged endarterectomy (BCS). Patients in both groups were comparable in age, heart disease, smoking status and gender whereas indications for surgery and the surgical management were similar. Preoperative examinations included duplex ultrasonography of the supra-aortic trunk and cerebral CT-scan. When needed cardiologic evaluation was also performed before surgery. All surgical procedures were performed under general anesthesia and in all cases a Pruitt-Inhara carotid shunt was utilized.

After surgery all patients underwent follow-up by means of duplex scan and clinical evaluation one, three and six months and yearly thereafter.

Results: Postoperative complications such as transient or permanent neurological deficits, myocardial infarction, pulmonary insufficiency, postoperative hypertension and death were compared in both groups and no statistical differences were found. However, it was observed that most severe complications occurred in patients treated with staged endarterectomy and were caused by the repeated surgical and anesthesiological stress.

Conclusions: Our study demonstrates that in high risk, accurately studied patients, simultaneous bilateral carotid endarterectomy performed by experienced vascular surgeons, reduces operative risk and anesthesiological complications. Moreover, reduces the risk of symptoms related to contralateral lesion, patient stress and obviates intersurgical delay.

V2-4

CAROTID ENDARTERECTOMY WITH REMIFENTANIL ANAESTHESIA: COMPARISON WITH LOCAL AND GENERAL ANAESTHESIA

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Objectives: Aim of this study was to compare perioperative results of carotid endarterectomy (CEA) performed with conscious sedation under remifentanyl (RA) with results obtained with general (GA) and local anaesthesia (LA) in our experience.

Methods: Between January 2005 and December 2007, 1040 consecutive CEAs were performed at our Institution. Data concerning these interventions were prospectively collected in a dedicated database and were divided in three groups on the basis of the kind of anaesthesia: RA group (226 interventions), GA group (218 interventions) and LA group (596 interventions). Patients operated on under GA underwent cerebral monitoring with somatosensory evoked potential (SEPs); selective use of shunt on the basis of SEPs or clinical modifications was used in all the patients. Early (<30 days) results in terms of stroke, death and myocardial infarction were analysed; differences between the groups were calculated with two test and Fisher's exact test. No ethical approval was required for this study.

Results: The three groups were homogenous in terms of demographic data and comorbidities, except for a significant prevalence of coronary artery disease (CAD) in GA group. Clinical and anatomical features were similar in the three groups; in patients undergoing reinterventions GA was significantly preferred. Shunt insertion rate was higher in RA and LA patients (14% and 12%, respectively) than in GA patients (8%), but the difference was not statistically significant. In RA and LA group there was a significantly lower rate of neurological deficits at the end of the interventions (no cases and one case, respectively) than in GA group (4 cases, 1.8%, $P=0.05$). No significant differences were recorded in terms of perioperative deaths and acute myocardial infarction; surprisingly, no perioperative neurological transient and permanent events occurred in RA group, while in LA and GA groups the corresponding values were 1% and 2%, respectively ($P=0.03$). Cumulative 30-day stroke and death rates were 2.2% in GA group, 0.5% in LA group and 0 in RA group ($P=0.01$).

Conclusions: In our experience, local anaesthesia offers significantly better results than general anaesthesia. In selected patients conscious sedation under remifentanyl may be a valuable alternative.

V2-5

CEREBRAL MONITORING IN PATIENTS UNDERGOING CAROTID ENDARTERECTOMY USING A TRIPLE ASSESSMENT TECHNIQUE

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Objectives: Cerebral monitoring is essential in patients undergoing carotid endarterectomy (CEA) for selective shunting. Several techniques are available for monitoring, however, none is superior to the awake test performing the procedure under local anaesthesia (LA). Cerebral oximetry (CO) has previously shown to assess cerebral perfusion in patients undergoing CEA. The aim of this study is to assess the reliability of CO in predicting the need for shunting in patients undergoing CEA compared with the awake test and trans-cranial Doppler (TCD).

Methods: All patients undergoing CEA under LA were included. Patients undergoing CEA under GA and patients with no TCD window were excluded

from the analysis. The Somanetics INVOS® CO was used for ipsilateral cerebral monitoring in all patients, in addition to TCD and monitoring of the clinical neurological status of the patients (awake test). The percentage fall in CO regional oxygen saturation (rSO_2), and decline in the flow volume (FVm) in TCD following carotid artery clamping were recorded. A drop in rSO_2 of >20% or FVm of >50% was considered an indicator of cerebral ischemia that may predict the need for carotid shunting. Patients were only shunted if clinically indicated based on neurological manifestations (awake test).

Results: The series consisted of 63 men and 12 women (median age of 71 years, range; 46-87 years). Eleven patients were converted to GA and 22 patients did not have a TCD window, were excluded from the analysis. Forty-two patients had triple assessment for cerebral monitoring were analysed. The median clamp time was 29 min. No patient suffered any permanent peri-operative neurological deficit. Eight out of forty-two patients (19%) patients were shunted based on the clinical manifestation. In this group, six patients had >20% drop in rSO_2 , and six patients had >50% drop in FVm. In the non-shunted group (34/42) only one patient had significant drop in the rSO_2 (false positive) while 8/34 patients had >50% drop in FVm. This represents a sensitivity of 80%, and a specificity of 97.1% for the CO in comparison to a sensitivity of 80% and a specificity of 82.9% for the TCD in detection of the need for shunting. The correlation coefficient between TCD and CO was 0.727.

Conclusions: Triple assessment for cerebral monitoring in patients undergoing CEA is reliable in predicting the need for shunting. However, CO is more specific compared to TCD. Using CO, a 20% drop in rSO_2 is a reliable cut-off in predicting the need for shunting.

V2-6

SURGICAL TREATMENT OF NON-SPECIFIC AORTOARTERITIS WITH BRACHIOCEPHALIC ARTERIAL LESION

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Objectives: The aim of our investigation was to analyse the results of patients treatment for non-specific aortoarteritis with brachiocephalic arteries lesion.

Methods: From November 1993 till January 2008, 229 patients for non-specific aortoarteritis were examined and treated in the A.V. Vishnevsky Institute of Surgery, Moscow, Russia. Out of the total number of patients there were 39 males and 190 females. The average age of the patients was 32.5. The laboratory signs of the inflammation were discover in 55.5% of cases. The acute stage of the disease was found in 32.5% of cases and subacute stage - in 23.2% of cases. The most common type of the arterial lesion was type 3 (Lupi-Herrera et al., 1977 classification), it was discovered in 57% of cases, type 1 was found in 29% of cases and type 2 - in 14% of cases. For patients with acute and subacute stages of the disease we used the intravenous injections of corticosteroids and cyclophosphan (1 g) per three days. The effectiveness of that therapy was 83.9%. We use methotrexate therapy as maintenance chemotherapy. Primarily we operated 120 patients and carried out 140 operations. Fifty-four patients underwent reconstructions of brachiocephalic arteries, 47 patients underwent reconstructions of thoracoabdominal aorta and its branches, 29 patients underwent solitary reconstructions of renal artery. In the cases of combined lesions 11 patients underwent multi-stage operations. In cases of brachiocephalic arteries reconstructions the surgery of choice are considered to be extrathoracic operations - the total number 29. The transthoracic operations were carried out in 26 cases if there were no suitable donor artery.

Results: We had no post surgical lethality after extrathoracic operations.

After one-sided transthoracic reconstructions of carotid arteries we had neither postoperative complications nor lethality. After aorta-bicarotid graft replacement done for 12 patients we had four hemorrhagic strokes, three of them with lethal outcome. After aorta-bicarotid graft replacement done for 12 patients we had four hemorrhagic strokes, three of them with lethal outcome. After the other types of transthoracic operations we had neither postoperative complications nor lethality.

Conclusions: 1) Surgery is indicated for patients suffering from non-specific aortoarteritis with occlusion and critical stenosis of common carotid arteries. 2) The surgery should be performed in the remission stage. 3) Extrathoracic reconstructions are the surgery of choice in cases of brachiocephalic arteries lesion. 4) Staged reconstruction of carotid arteries is indicated for patients with bilateral lesion.

V2-7

SURGICAL (TRANSTHORACIC OR CERVICAL) AND ENDOVASCULAR REPAIR OF THE SUPRAORTIC TRUNK COMPLEX LESIONS. A SINGLE-CENTRE EXPERIENCE

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Objectives: Reconstruction of the supraortic trunks can in most cases be performed with either a transthoracic or a cervical approach, or endovascular repair. Patients with severe co-morbidity or candidate to redo-surgery for previous mediastinal approach, are also poor candidates for a transthoracic operation. These patients should undergo reconstruction with cervical or endovascular technique. We present our experience in the treatment of these complex lesions

Methods: Over a 15-years period (1991-2006), we treated 64 patients (76 total interventions: 10 transthoracic, 34 cervical and 32 endovascular) with supraortic trunk complex lesion (8 for aneurysmal and 56 for occlusive disease). There were 5 endarterectomies, 27 bypasses, 4 arterial transposition, 8 resection of aneurysm and 32 endovascular procedures. The hybrid approach was required in five patients. Forty-two patients were asymptomatic and 22 symptomatic (cerebrovascular ischemia in eight patients and upper extremity ischemia in 14). The innominate artery, common carotid artery and subclavian artery were involved in 5, 28 and 40 patients, respectively. Multiple trunks were reconstructed in eight patients.

Results: No intraoperative mortality or stent-graft related complication were observed. Two perioperative deaths and one non-fatal stroke occurred, for a combined stroke/death rate of 4.6%. Perioperative complications included 1 asymptomatic graft occlusions, 1 non-fatal myocardial infarction, 2 significant pulmonary complications, 1 wound infection, and 2 cranial nerve injury.

Conclusions: Direct reconstruction of complex symptomatic supraortic trunk lesions can be performed with acceptable death/stroke rates and with long-term patients benefit. Asymptomatic lesions in patients who have significant concomitant conditions should be managed with a less-invasive either cervical or endovascular approach, though long-term outcome of the latter is inferior.

V2-8

MINI SKIN INCISION FOR CAROTID ENDARTERECTOMY: LONGITUDINAL VS. TRANSVERSE CERVICAL INCISION - A COMPARATIVE STUDYG. Marcucci, A. Siani, R. Antonelli, F. Accrocca, G.A. Giordano, R. Gabrielli
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Objectives: Nerve injuries, wound complications and especially poor cosmetic results still show an important impact on the carotid endarterectomy (CEA) morbidity. Introduction of the mini skin incision in clinical practice seems to be safe with reduction in postoperative pain and superficial nerve lesions, and better aesthetical results. Few reports evaluate the transverse and longitudinal incision to define the best surgical approach. This study compare the results between the short longitudinal with the transverse cervical skin incision.

Methods: From January 2004 and December 2007, 266 patients underwent 300 primary CEA procedures. Two hundred and nineteen patients were submitted to short longitudinal cervical incision (group A), 81 performed a transverse cervical skin incision (group B). In all cases a preoperative CEA Duplex assisted skin marking was carried out. The length of the skin incision was ranging from 5 to 8 cm. (A) and 4-6 cm. (B). Preoperative and postoperative cranial nerves evaluation was always performed. Stroke/TIA, death, wound complications, cranial and cervical nerves injuries and re-stenosis rate were reported and evaluated through statistical analysis (χ^2 and *t*-Student test).

Results: The 30-day mortality rate was 0.3% (1/300). The TIA rate was 0.91% in group A and 1.2% in group B ($P>0.9$). Wound complications were 1.8% and 1.2%, respectively ($P>0.1$). No statistical differences were reported in the incidence of cranial and cervical nerves injuries between the two groups ($P>0.9$). No difference in re-stenosis rate was detected ($P>0.9$).

Conclusions: No difference was achieved between longitudinal and transverse cervical skin incision in term of stroke, wound complications or nerve impairment. As optimal cosmetic results were gained in both groups, on the basis of our experience the longitudinal cervical approach is to prefer because can lead to a more easy proximal and distal extension, shunt deployment and control of the distal internal carotid artery in cases of atheromatous extension of the plaque.

V2-9

ACCURACY OF CEREBRAL OXIMETRY IN PREDICTING THE NEED FOR SHUNTING IN CAROTID ENDARTERECTOMY UNDER LOCAL ANAESTHESIAH. Mistry¹, M. Halawa¹, D. Green¹, R.W.A. Dawson², M. Tyrrell¹, H. Rashid¹, D. Valenti¹¹Department of Vascular Surgery, Kings College Hospital, London, UK;²Vascular Surgery Unit, Royal Infirmary of Edinburgh, UK

Objectives: The aim of this study is to assess the accuracy of cerebral oximetry CO in predicting the need for shunting of patients undergoing carotid endarterectomy (CEA) under local anaesthesia (LA).

Methods: This is a prospective study of 118 consecutive patients undergoing CEA under LA in three tertiary referral centres between November 2004 - October 2006. The Somanetics INVOS[®] cerebral oximeter was used for cerebral monitoring in all patients. A 20% decrease in regional oxygen saturation (rSO₂) reading from the pre clamp baseline was used as an indicator of cerebral ischaemia that may predict the need for carotid shunting. Patients were only shunted if clinically indicated based on neurological manifestations. The series consisted of 93 men and 25 women (median age; 73 years, range; 62-85 years).

Results: Fifteen patients required shunting (shunt rate 12.7%). The median clamp time was 34 min. The peri-operative stroke rate was 1.7% (2/118 patients). In the group of patients that required shunting (15/118) the median percentage drop in rSO₂ was 22% (range; 14-40%) whereas in the non-shunted group (103/118) it was 7.5% (range; 0-30%). One patient in the shunted group (*n*=15) i.e. 6.7% had a non-significant drop in the rSO₂, whereas 13 patients in the non-shunted group (*n*=103) i.e. 12.6% had a significant drop in rSO₂. This represents a sensitivity of 93.3% and a specificity of 87.4% and provides a positive predictive value of 51.9% and a negative predictive value of 98.9%.

Conclusions: Cerebral oximetry has shown a high negative predictive value, but its positive predictive value is low in selecting patients for carotid shunting during CEA under LA. A 20% drop in rSO₂ as a predictor of the need for carotid shunting should be used with another cerebral perfusion monitoring method during CEA under GA.

April 25th, 2008 2nd Congress Day**16:30-18:00****5th Cardiac Scientific Session - Aortic Valve Repair**

C5-1

CRYOLIFE O'BRIEN STENTLESS VALVE REOPERATION: A LOW RISK PROCEDURE WITH SATISFACTORY LONG-TERM RESULTSD. Pavoni¹, F. Ius¹, L.P. Badano¹, I. Vendramin¹, E. Mazzaro¹, V. Tursi¹, G. Thiene², U. Livi¹¹Department of Cardiopulmonary Sciences, University Hospital, Udine, Italy; ²Department of Pathology, University of Padua, Padua, Italy

Objectives: Stentless valve reoperations are becoming more common as they reach the durability limits. Relatively few studies have reported results of stentless valve reoperation. Accordingly we reviewed our experience on redo surgery for the Cryolife O'Brien (CLOB) stentless valve.

Methods: All patients with CLOB stentless valve undergoing redo aortic valve replacement (AVR) at our institution were reviewed (*n*=30; 60% males; mean age 70±12 years).

Results: Redo AVR was performed 69±40 months (range 1-133 months) after stentless valve implantation. Fifteen patients (50%) underwent urgent or emergency procedures. The indication for redo AVR was structural valve dysfunction in 18 patients (60%). Pathological examination of the explanted valves showed cusp tears in five patients, calcification alone located primarily in the basal and commissural regions of the cusps in three patients and evidence of calcification associated with cusp tears in ten patients. Other causes of redo AVR were peri-prosthetic leak in three cases (10%), sinotubular dilatation in three cases (10%), and acute endocarditis in six cases (20%). Severe aortic insufficiency was present in 26 patients (87%). Only three aortic root replacement operations (10% of patients) were required due to native aortic root dilatation. Nobody died within 30 days after operation. Long-term survival at one and five years postoperatively was 90±6 and 58±12,

respectively. Of the late deaths ($n=10$), none was valve related, and three were cardiac related.

Conclusions: Reoperation for CLOB stentless failure is a simple procedure that only in few cases requires aortic root replacement. In our experience CLOB valve reoperation is associated with no risk of early death and with satisfactory long-term survival.

C5-2

AORTIC VALVE REPAIR: RESULTS OF TEN YEARS EXPERIENCE

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Objectives: In patients with aortic valve insufficiency (AI), valve repair requires a tailored surgery determined by the leaflets and proximal aorta anatomy which prompt us to develop a functional classification of AI. This classification has implication on the surgical strategy and outcome. In this study, we analyze one decade experience with aortic valve (AV) repair.

Methods: Between January 1996 and December 2006, 298 patients underwent elective aortic valve repair. Aortic annulus, root or ascending aorta dilatations were managed by following techniques: subcommissural annuloplasty, sinotubular junction plication, ascending aorta replacement, root remodelling or valve reimplantation. Cusp prolapses were corrected by plication, triangular resection or free margin shortening with PTFE (Goretex 7/0). Cusps perforation were closed with autologous pericardial patches.

Results: Hospital mortality was 1.5% (4 patients). Five (2%) patients needed early aortic valve reoperation, two of them were re-repaired. Follow-up is 94% complete and reach a mean of 45 ± 32 months. During this period, 14 late deaths occurred, 10 cardiac related. Eleven patients needed late aortic valve reoperation, two of them were re-repaired. At three and six year, overall survival, freedom from aortic valve reoperation and freedom from aortic valve regurgitation >2 were $96\pm 2\%$ and $91\pm 6\%$, $95\pm 3\%$ and $94\pm 4\%$, $93\pm 4\%$ and $86\pm 7\%$ respectively. Thromboembolic events occurred in 6 (2.3%) patients during the follow-up and no aortic valve endocarditis were recorded.

Conclusions: The functional classification allows a systematic approach of AI and may enhance the reparability rate. Moreover, it facilitates anticipation of the surgical technique and the prediction of the durability. Cusp restrictive motion (type III), due to fibrosis or calcification, is an important imitation for conservative surgery.

C5-3

RESULTS OF THE SHELHIGH STENTLESS BIOPROSTHESIS IN PATIENTS WITH ACTIVE INFECTIVE ENDOCARDITIS: 7-YEAR SINGLE CENTRE EXPERIENCE IN 255 PATIENTS

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Objectives: To investigate early and mid-term results following valve replacement with Shelhigh stentless bioprosthesis made entirely of biological material in patients with active infective endocarditis (AIE). Methods: Over the last 20 years, 1143 AIE operations were performed. Of these, 255 patients (mean age 59 years) received Shelhigh bioprostheses between 02/2000 and 03/2007. A total of 73.7% had native AIE and 26.3% prosthetic AIE. Surgery was regarded as urgent in 57.3 and as an emergency procedure in 38.4%. The mean follow-up time is 1.6 ± 0.12 years (1 months to 6.6 years).

Results: There was a highly significant difference in the survival rate between patients who were operated on urgently vs. in an emergency (30-day, 1-year, 3-year and 5-year survival was 83.7%, 67.7%, 63.6%, 56.0% vs. 57.3%, 45.3%, 34.9%, 31.0%; $P<0.0001$), single vs. double valve replacement ($P=0.033$), and patients with and without abscess formation ($P=0.0245$). Main cause of early death was septic multiorgan failure. Only five patients required reoperation due to early reinfection (1.9%). TEE doppler gradients (3, 6, 12 months) showed good hemodynamics.

Conclusions: Our experience in the use of Shelhigh bioprostheses in patients with native and prosthetic endocarditis shows the early and mid-term results, in particular the low reinfection rate and the good hemodynamics, to be comparable with the results achieved using homografts. Better survival

should be achieved if patients could be operated on earlier. Since these prostheses are readily available and their implantation straightforward, they are increasingly being used in patients with endocarditis. These promising results need to be verified in the long-term.

C5-4

EARLY AND LATE RESULTS OF AORTIC VALVE REPLACEMENT IN OCTOGENARIANS

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Objectives: Aortic valve replacement (AVR) in patients over 80 years of age has been demonstrated to have satisfactory functional results also in the long-term. However, the impact of concomitant procedures on early and late outcomes following AVR remains to be investigated.

Methods: Between 1990 and December 2007, cardiac surgery was performed in 560 octogenarians. A retrospective review was performed in 297 patients (180 women, 61%) with a mean age of 83 ± 2 years, who underwent isolated AVR ($n=153$), AVR with CABG ($n=117$), and AVR with mitral valve surgery (MVS) and with or without CABG ($n=27$). Data were analyzed with Kaplan-Meier estimates of survival.

Results: Preoperative NYHA classes were I in 7%, II in 28%, III in 57%, and IV in 7%. Operative (30-day) mortality was 5% for isolated AVR, 3% for AVR+CABG, and 15% for AVR+MVS±CABG. One-year, 5-years and 10-years survival were $91\pm 2\%$, $73\pm 5\%$, $45\pm 8\%$, respectively, for AVR; $89\pm 3\%$, $60\pm 7\%$, $23\pm 1\%$, respectively, for AVR+CABG; and $79\pm 8\%$, $45\pm 12\%$, $22\pm 17\%$, respectively, for AVR+MVS±CABG ($P=0.025$). Preoperative NYHA class did not affect operative or long-term survival.

Conclusions: Octogenarians patients who undergo AVR have acceptable short- and long-term survival regardless of NYHA class. Performing concomitant CABG was protective in terms of operative mortality. Conversely, MVS with or without CABG conveys a significant worse short- and long-term prognosis.

C5-5

DOBUTAMINE STRESS ECHOCARDIOGRAPHY COULD PREDICT WORSE LONG-TERM OUTCOME OF ASYMPTOMATIC PATIENTS WITH PROSTHESIS MISMATCH AFTER AVR

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Objectives: Most patients with good LVEF and moderate patient prosthesis mismatch (ppm) after small size (19-21 mm) aortic valve replacement (AVR) become asymptomatic, but different outcomes in exercise capacity and LV mass regression occur in individual subjects in long-term observation. We endeavour to estimate whether dobutamine stress echocardiography (DSE) could predict a worse long-term recovery of such group of patients.

Methods: Forty-eight asymptomatic patients (17 males and 31 females) with identified moderate ppm (EOA Index: $0.85 \pm 0.65 \text{ cm}^2/\text{m}^2$) and mean LVEF $52\pm 5\%$ were studied 12 months after AVR with reference to NYHA class and LV mass value. DSE to maximal $40 \mu\text{g}/\text{kg}/\text{min}$ dose of dobutamine and/or $\text{HR}>120/\text{min}$ was performed in each patient with analysis of peak (PG) and mean (MG) stress transprosthetic gradients. DSE findings divided patients into two groups. Group I (23 patients) with significantly higher stress PG and MG: 72 and 40 mmHg and group II (25 patients) with lower: 53 and 25 mmHg PG and MG ($P=0.024$).

Results: NYHA and LV mass were comparable in both groups at one year observation: 321 and 313 g, ($P=NS$). At three years group I present significantly lower LV mass reduction than group II: 281 vs. 215 ($P=0.003$). Thirteen patients (56%) of group I and two patients (8%) of group II changed NYHA class from I to II and became symptomatic ($P=0.0062$). Follow-up values of BSA: 1.84 vs. 1.86 m^2 , rest MG 19 vs. 21 mmHg and LVEF 51.4 vs. 52.9% were comparable ($P=NS$).

Conclusions: Asymptomatic patients, with good LVEF and moderate ppm after AVR despite of good early results are at risk of worse long-term clinical and hemodynamic recovery. In our observation dobutamine stress echocardiography could specify such a group of patients and predict their late outcome.

C5-6

FOUR YEARS OF FOLLOW-UP OF THE ROSS PROCEDURE IN ELDERLY-PATIENTS

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Objectives: Although the Ross procedure allows optimal left ventricular regeneration and excellent hemodynamic behavior, it is controversial to perform this operation in patients at the age of 60 years and older.

Methods: Since 1994, 428 consecutive patients received a Ross operation in which we identified 167 patients over the age of 60 years. The mean age was 64.8±3.4 years (range 60-76 years). Concomitant procedures were performed in 71 patients (49%), coronary bypass surgery in 25 patients, ascending aorta treatment in 19 patients mitral valve treatment in 18 patients and atrial ablation in 11 patients. Transthoracic echocardiography was obtained preoperatively, at discharge and at yearly intervals. Records were evaluated for survival, clinical status, adverse events and valve function.

Results: Follow-up was 100% complete. Hospital mortality was 2.6% (3 patients). Up to four years of follow-up three more patients died, one cardiac and two non-cardiac death. During follow-up, two patients were reoperated on the neo-aortic valve. The average mean pressure gradient at discharge over the neo-aortic valve was 5±2 mmHg and at the at the latest follow-up 4±1 mmHg, with absence of neo-aortic regurgitation. **Conclusions:** The Ross operation seems to be an appropriate option in elderly patients with low operative mortality and low rate of reoperation.

C5-7

EXPERIENCE WITH THE MATRIX-P PLUS HEART VALVE FOR PULMONARY VALVE REPLACEMENT DURING ROSS OPERATION

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Objectives: Two-year experience with a decellularized porcine heart valve for reconstruction of the right ventricular outflow tract during the Ross operation.

Methods: From September 1, 2005 to August 31, 2007, a total of 161 patients underwent the Ross procedure with the use of the Matrix-P Plus for pulmonary valve replacement. Mean age was 58.6±8.2 years (range 17-75 years). Mean logistic EuroSCORE was 6.3±5.0% (range 1.3-85.6%). Eight patients suffered from active infective endocarditis. Fifty-two patients (32.5%) required one to three additional cardiac surgery. Twenty-four received one to three coronary artery bypass grafts, thirteen reconstruction or replacement of the ascending aorta, eight mitral valve repair or replacement, eight left atrial ablation and three other procedures. Follow-up was performed by clinical evaluation, echocardiography and reporting of adverse events.

Results: Follow-up is 100% complete. Hospital mortality was 5% (8/161). During follow-up three patients died and five patients required reoperations. Three on the pulmonary valve due to stenosis at the distal anastomosis (n=1) or external compression (n=2). All received again a Matrix-P Plus valve. One patient required replacement of the ascending aorta and one patient was reoperated due to persisting endocarditis. Histological evaluation of the explanted Matrix-P Plus showed repopulation with host cells. Echocardiography of the pulmonary valve showed a mean pressure gradient of 2.5±1.2 mmHg without any rise up to two years, 85% of the patients are currently in NYHA class I with no valve related complications during follow-up.

Conclusions: The Matrix-P Plus decellularized heart valve shows excellent two years performance.

C5-8

FINITE ELEMENT ANALYSIS OF PULMONARY AUTOGRAFT DILATION

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Objectives: Progressive dilatation of the pulmonary autograft can lead to aortic insufficiency requiring reoperation. We have defined regionally specific, anisotropic and non-linear material properties for the aorta and

pulmonary artery to develop the first of its kind finite element model (FEM) of the Ross procedure.

Methods: Tissue samples (1 cm², n=8) cut from five regions of the aorta and pulmonary artery - anterior, posterior, and each sinus - were subjected to displacement controlled equibiaxial stretch testing. Calculated stress-strain data was used to derive individual strain energy functions for each region. Two asymmetric aortic root meshes were created (TrueGrid) representing the undilated native aorta and autograft using measured tissue thickness with annular and sinus dimensions from literature. Meshes contained five individual materials merged, each defined by derived material properties. Systolic pressure curves were input to LS-DYNA as loading conditions on the FEM, and the degree and direction of tissue dilation was examined to evaluate postoperative root dynamics.

Results: During biaxial testing, the aorta and pulmonary artery exhibited similar material properties qualitatively. Evaluation of tissue stiffness, defined as the slope of the stress-strain plot at normal aortic dilation, revealed both tissues were significantly stiffer in the circumferential than longitudinal axis (161 kPa vs. 128 kPa, P=0.0007 pulmonary; 297 KPa vs. 246 KPa, P=0.0005 aortic). Both had greater non-linearity in the sinus than the ascending region, reaching a transition point of rapidly increasing stiffness between 32-45%. However, the pulmonary artery was significantly more compliant than the aorta overall for both axes in the sinus (235 KPa vs. 409 KPa, P=0.0002) as well as distal to the sinotubular junction (144.93 KPa vs. 271.57 KPa, P=1.22*10⁻¹¹). As such, the autograft remained well within the high stiffness region at all times during the simulation, and underwent a small change in diameter during systole as compared to the total lumen dilation caused by aortic pressure.

Conclusions: Autograft compliance causes large, non-linear tissue deformation when subjected to aortic pressures, but a relatively small systolic dilation. Cyclic loading of the tissue in the stiff, highly deformed region may contribute to arterial remodeling and progressive dilatation following the Ross procedure.

C5-9

EXPERIENCE AND INTERMEDIATE-TERM RESULTS USING THE CONTEGRA® HETEROGRAFT FOR RIGHT VENTRICULAR OUTFLOW RECONSTRUCTION IN ADULTS

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Objectives: The Contegra® bioprosthesis (valved heterologous bovine jugular vein) is used for reconstruction of the right ventricular outflow tract (RVOT) in congenital heart malformations and pulmonary valve replacement in different settings. Compared to pulmonary homografts, the Contegra® conduit is readily available on the shelf. So far, its use was mainly described in children. The aim of this study is to evaluate the feasibility and the outcome of Contegra® graft implantation in the adult.

Methods: Between November 1999 and August 2007, a total of 30 Contegra® grafts were implanted in 29 patients (23 men and 6 women), with a mean age of 35.6 years (range 18-54 years). All operations have been completed through median sternotomy with cardiopulmonary bypass. Conduit sizes included 22 mm (n=29), 20 mm (n=1).

Results: There was no hospital mortality and no conduit related early morbidity. Important postoperative complications included haemorrhage and pericardial tamponade requiring operative revision (n=2), postoperative rhythmologic disorders (n=7) and pneumonia (n=3). One patient presented a mediastinitis requiring operative revision of the sternum, treatment by vacuum assistance and systematic antibiotic application for six weeks before secondary closure of the sternotomy. In the median follow-up there was one late death, due to a heart failure (total mortality 3.5%), not conduit related. Main indication for pulmonary valve replacement in adults was the Ross procedure (n=20) followed by reoperations of corrected Fallot tetralogies (n=5) and isolated pulmonary valve replacement (n=2) (others: n=2). A replacement of the Contegra® tube had to be done in one patient 16 months after a Ross procedure for a symptomatic graft stenosis. Postoperative echocardiography follow-up showed low transvalvular pressure gradients: in the Ross group (mean pressure 13.1 mmHg, 11.7 mmHg at mid-term follow-up), the Fallot group (mean pressure 12.2 mmHg - postoperative, 14.4 mmHg at mid-term follow-up) and isolated pulmonary valve replacement (mean pressure 6 mmHg, 11.5 mmHg at mid-term follow-up) with all patients being in NYHA functional class II or I.

Conclusions: The main indication for using a Contegra® graft for pulmonary valve replacement in adults is the Ross procedure. In this review of 30 oper-

ations mortality was low, mid-term results showed good functional results and low transprosthetic gradients with sizes of 22 or 20 mm. Graft degeneration was not an issue with only one reoperation. The use of Contegra® graft for pulmonary valve replacement in adults is a good option. Follow-ups are still needed to evaluate long-term results, especially concerning degeneration and calcifications.

April 25th, 2008 2nd Congress Day 16:30-18:30 6th Cardiac Scientific Session - Aortic Valve

C6-1

ACTIVE AORTIC VALVE ENDOCARDITIS: IMMEDIATE AND LONG-TERM RESULTS

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Objectives: This study aimed to determine risk factors for in-hospital mortality, morbidity and long-term survival following surgery due to active aortic valve endocarditis.

Methods: This retrospective study included 154 patients operated on active aortic valve endocarditis between February 1993 and December 2006. Of the patients 32 (20.8%) were women and 122 (79.2%) were men. Median age was 45.65±13.83 (ranging between 14 and 80 years). Of 21 (13.6%) were prosthetic valve endocarditis while the remaining was native valve endocarditis.

Results: The overall in-hospital mortality was 24 (15.6%). Univariate analysis demonstrated that female gender, preoperative NYHA class, prosthetic valve endocarditis, postoperative renal failure and postoperative AV block were the risk factors for early mortality. Multivariate analysis revealed that female gender (OR: 5.270) and postoperative renal failure (OR: 48.879) have significantly associated with increased early mortality. Late mortality was 10.5% (13/124). The only predictor of late mortality was mitral valve involvement ($P=0.037$). Recurrent endocarditis was 7.1% (11/154) and reoperation rate was 3.2% (5/154). Cumulative survival was 81.9±6.5%. Mean follow-up time was 6.49±4.63 years.

Conclusions: Although active aortic valve endocarditis is still a challenging pathology, surgical treatment can be done with acceptable early and late results in selected patients.

C6-2

ANTICALCIFICATION TREATMENT OF VALVE TISSUE IN EXPERIMENTAL MODEL

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Objectives: If untreated, the natural response to these xenografts is acute rejection with cytotoxic elimination of donor cells and degradation of the extra cellular matrix. The most effective treatment to overcome this prohibitive predicament seemed to be cross linking, which was shown to mask xenogenicity and to mitigate degradation. So, current research is investigating the development of additional anticalcificant treatments.

Methods: Valved conduits were harvested in local slaughterhouse, prepared and pretreated with glutaraldehyde (glu) alone or in association with different compounds (ethylenediaminetetraacetic acid (EDTA), sodium ethylenediaminetetraacetic acid (na EDTA), D-Alanine, D-Norvaline). As opposite treatments were tested acil azide or carboimide alone, or together with other compounds. All samples were implanted subcutaneously in 30 days old Wistar rats. Explantation performed after 60 days. Residual calcium level was assessed, also histological examination was performed.

Results: Data were divided into groups: first analysing how all different agents effect on each biomaterial sample, second group how each agent separately influences all materials. Aortic valve leaflet explants showed the lowest calcium level in samples treated with carboimide alone 0.64±0.15 mg/g and it was statistically significant different from all agents in this group. In samples from aortic wall the lowest calcium concentration was revealed also in carboimide alone treatment 8.3±1 mg/g, the mean was statistically significant different comparing to all agents. Low residual

calcium amount was found in mitral valve samples treated with glu/Na EDTA 0.69±0.18 mg/g, but comparing their means in case of treating with carboimide, we do not find it statistically not different. The best impact on lowering calcium level comparing each agent effect on the different bio-materials was found in mitral valve samples.

Conclusions: The most effective anticalcification treatment comparing all agents is in case of usage carboimide alone and with glu/Na EDTA in mitral valve. The best effect comparing single agents was found when used glu/Na EDTA in most cases.

C6-3

ST. JUDE EPIC HEART VALVE BIOPROSTHESES VS. NATIVE HUMAN AND PORCINE AORTIC VALVES - DIFFERENCES IN BIOMECHANICAL PROPERTIES

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Objectives: The major problem with heart valve bioprostheses made from chemically treated porcine aortic valves (AoV) is their limited longevity caused by structural deterioration. There are no published studies on the mechanical properties of modern, commercially available bioprostheses comparing them to native human valves. Objective of this study is to determine the mechanical properties of EPIC bioprostheses and to compare them with native human and porcine AoV.

Methods: Leaflets from eight porcine AoV and three EPIC bioprostheses (St. Jude Medical, Minnesota, USA) were analysed using uniaxial tensile tests in radial and circumferential directions. Mechanical properties of human AoV have been previously published by our group (Stradins et al., 2004). Results are represented as mean values±S.D.

Results: In both directions there is a shift to the stress axis of the stress-strain curve for the EPIC bioprostheses when compared to native valves.

Modulus of elasticity (E) of EPIC bioprostheses in circumferential direction at the level of stress 1.0 MPa is 134.92±37.4 MPa, E of native porcine AoV - 42.3±4.96 MPa, E of human AoV - 15.34±3.84 MPa. Ultimate stress is highest for EPIC bioprostheses - 6.84±0.66 MPa, human AoV have ultimate stress of 1.74±0.29 MPa and porcine AoV - 1.58±0.26 MPa. Ultimate strain in circumferential direction is highest for human valves 18.35±7.61% followed by 7.26±0.69% for porcine valves and 5.15±0.61% for EPIC bioprostheses. In radial direction the relations of E among samples are the same as in circumferential direction - 7.8±1.25 MPa for EPIC bioprostheses, 5.47±0.67 MPa for native porcine, and 1.98±0.15 MPa for human AoV. In the radial direction ultimate stress is highest for EPIC bioprostheses 0.8±0.26 MPa followed by native porcine valves - 0.51±0.1 MPa and 0.32±0.04 MPa for human valves. For human AoV ultimate strain is 23.92±3.94%, for native porcine valves - 8.71±0.92% and 6.45±0.93% for EPIC bioprostheses.

Conclusions: EPIC bioprostheses have a non-linear stress-strain behaviour similar to native valvular tissue, but they are significantly stiffer and hence less elastic compared to native porcine and human AoV. Reported biomechanical properties of native human and porcine AoV, and EPIC bioprostheses provide important information on current bioprostheses and an important insight for heart valve tissue engineering.

C6-4

EXPERIENCE WITH A NEW BIOLOGICAL VALVE MADE OF HEPATIC GLISSON'S CAPSULE: LONG-TERM RESULTS

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Objectives: There is a constant search for an optimum material for heart valve bioprosthesis. Ten years ago, we introduced a new biological valve Bioglis made of hepatic Glissons capsule which is more elastic than bovine pericardium. Our further investigations, when Bioglis was used for tricuspid valve replacement, have shown good early and mid-term results. The aim of the present study is to assess long-term results of Bioglis valve implanted into tricuspid position.

Methods: Hepatic Glissons capsule taken from bull calves was used for Bioglis valve, which was formed on a flexible frame. The biological valve was implanted in 21 patients with Ebsteins anomaly or congenital tricuspid insufficiency. The age of patients ranged from 3 to 48 years (mean, 24.6±4.2 years). All patients were followed-up for 36-120 months (mean, 80 months).

Bioglis function was assessed by means of two-dimensional echocardiography and Doppler examination. Follow-up evaluation also included ECG and X-ray examination.

Results: There were no early or late deaths. All followed-up patients were in I-II New York Heart Association functional class. The peak pressure gradient across the bioprosthesis was as low as 4.5 ± 1.0 mmHg (range, 4-8 mmHg). The mean pressure gradient ranged from 1.3 to 2.5 mmHg (mean, 1.7 ± 0.5 mmHg). The mean effective orifice area of the valve calculated from Doppler flow velocity reached 2.25 ± 0.05 cm². The signs of calcinosis were absent. Left ventricular ejection fraction ranged from 54% to 67% (mean, 59.2 ± 9.1 %).

Conclusions: Excellent results achieved with Bioglis valve made of hepatic Glissons capsule gives the rationale to recommend it for tricuspid replacement in patients with congenital valvular lesions. Comparative assessment of biological valves made from hepatic Glissons capsule and bovine pericardium should be considered.

C6-5

ELAN STENTLESS AORTIC VALVE REPLACEMENT: CLINICAL EXPERIENCE 2000-2007 AT THE S.AMBROGIO CLINIC IN MILAN

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Objectives: Evaluation of postoperative data, hemodynamic performance and medium-term result.

Methods: Between March 2000 and October 2007, 230 aortic elan stentless bioprostheses were implanted at the S. Ambrogio Clinic in Milan; in the period mentioned we implanted 14 n°19 prostheses, 83 n°21 prostheses, 97 n°23 prostheses and 36 n°25 prostheses. There were 90 patients over the age of 75; the prevalent pathology was aortic valvular stenosis; 76 associated operation were performed: 65 CABG, seven mitral repairs, four CABG plus mitral repair. Postoperative data and complications have been considered; the transvalvular gradient and valvular surface area were monitored by means of echocardiogram upon discharge, after three months, six months and after one year.

Results: Average cardiopulmonary bypass time was 112.25 ± 19.50 and aortic clamp 92 ± 13.45 ; the mean intubation time was 18.2 ± 1.5 and the average time to discharge was 13 days. Operative mortality was 0.8% (2 out of 230), the cause of death was cardiogenic shock in both patients; 12 patients died 60 days after the operation (2 for pulmonary disease, 3 stroke, 2 cancer, 2 myocardial infarction); reoperation for valvular regurgitation: 1 patient; reoperation for endocarditis: two patients. Among the immediate complications, postoperative reopening because bleeding occurred in six patients, in two patients a pace-maker had to be implanted because of complete atrio-ventricular heart block. Reduction of transvalvular gradients, reduction of left ventricle wall thickness and increase in the valvular surface area was observed after six months and one year.

Conclusions: The results of our study have demonstrated that these valves have a satisfactory hemodynamic performance, the absence of annulus reinforcement tissue allows the prosthesis to be implanted in very small aortas, especially if using sizes from 19 to 25, it can be seen that the aortic valve perfectly adapts to the aortic wall. A porcine root in a size larger than 25 is more rigid and has a thicker wall, this reduces the advantages of the stentless prostheses non-permitting it to perfectly adapt to the aortic wall which, especially in this type of valve with no reinforcement, is very noticeable. Also this type of prosthesis is preferable in cases of bacterial endocarditis, especially because of the absence of artificial tissue. recently Aortech Elan stentless bioprostheses is used in Biovalsalva Valved conduit, the only aortic valved conduit with biological porcine prosthesis. We believe that the long-term data will confirm the good results we have had in the medium term.

C6-6

EXPERIENCE WITH THE 19-MM MEDTRONIC MOSAIC BIOPROSTHESIS IN THE ELDERLY

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Objectives: Valve replacement in small aortic root without annulus enlargement remains a surgical challenge and raises concern about its long-term results.

Methods: Between January 1993 and December 2004, 263 (16%) of 1639 underwent aortic valve replacement using a 19-mm prosthesis. In 49 (18.6%) of the 263 patients a mosaic bioprosthesis was implanted. There were 45 females and 4 male, with mean age of 77.2 years (49.7-84.4 years). Twenty-two (44.5%) patients underwent concomitant procedures; Twenty (40.8%) patients required coronary artery bypass grafts and 2 (4%) double and triple valve procedures. The mean body surface area (BSA) was 1.64 m² (range, 1.26 - 2.04 m²). Thirteen (26.5%) patients had BSA of >1.7 m².

Results: Follow-up was 100% complete in regards to mortality. The 30-day mortality was 12.2% (6 patients). There were two late deaths. The survival rate at five years was 79%. One valve related re-operation was performed because of a paravalvular leakage. NYHA class was improved from 3.45 preoperatively to 1.67 postoperatively. There was no incidence of thromboembolism. There were no deaths in the patients with severe prosthesis - patient mismatch (PPM <0.65 cm²/m²). Urgent and emergency operations were an independent risk factor ($P=0.0053$) with a $2.5 \times$ higher relative risk for mortality (with a 95% confidence limit between 1.33-5.17).

Conclusions: Aortic valve replacement with the 19 mm Medtronic mosaic bioprosthesis offers excellent mid- and long-term results in terms of functional capacity and valve related complications.

C6-7

AORTIC VALVE REPLACEMENT COMBINED WITH CORONARY ARTERY BY-PASS GRAFTING IN OCTOGENARIANS: EARLY AND MID-TERM RESULTS

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Objectives: Aortic valve disease associated with coronary atherosclerosis is increasingly common in older population. Surgery is still the treatment of choice in young patients, but indications and results of aortic valve replacement combined with coronary grafting are still under debate in older patients.

Methods: Between January 2001 to December 2007, 165 combined aortic valve replacement (AVR) with coronary artery bypass grafting (CABG) were performed in patients older 80 years. The patients were studied retrospectively by collecting data from hospital records and followed for 0-7 years.

Results: The mean age was 84 ± 2.5 years, 97 were male. We analyzed the preoperative, intraoperative and postoperative risk factors for outcome. Preoperative factors as low ejection fraction, chronic atrial fibrillation, high NYHA class, aortic regurgitation and polyvasculopathy were predictors of poor outcome. Intraoperative factors as clamp time, calcified aorta, incomplete revascularization were predictors of poor outcome. Postoperative factors as acute renal failure, long time ventilation and tracheostomy, mediastinitis, postoperative acute myocardial infarction, and major neurologic complications were risk factors for a poor and long-term outcome. The in hospital mortality was 7.5%, and the three years survival rate was 75.4%.

Conclusions: AVR with concomitant CABG in older population is a complex operation. A carefully evaluation of preoperative status is very important to achieve a good surgical indication and outcome. Afterwards in literature and in our experience the in hospital mortality is still high compared with the younger population. We feel that aortic valve surgery in healthy octogenarians with concomitant coronary artery disease may be performed with an acceptable risk. In the other patients we need further studies to evaluate the better and safer strategy.

C6-8

ESSENTIAL HYPERTENSION ACCORDING TO ESH/ESC GUIDELINES AS AN INDEPENDENT PREDICTOR OF WORSE PROGNOSIS IN PATIENTS SUBJECTED TO AORTIC VALVE REPLACEMENT

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Objectives: According to available data there are few well-known predictors of increased morbidity and mortality in patients subjected to aortic valve replacement (AVR). The aim of the study was the evaluation of significance

of essential hypertension on the prognosis in patients with aortic stenosis and regurgitation subjected to AVR.

Methods: It was a prospective analysis of 300 patients subjected to aortic valve replacement due to aortic stenosis (AS, $n=150$) and aortic regurgitation (AR, $n=150$). Each patient included for the study underwent preoperative coronary angiography, and no significant changes were found. Echocardiography was performed in the preoperative period (upto 48 h), early postoperatively (on average after 9 days) and as a follow-up examination (18-24 months following cardiac surgery).

Results: Early postoperative mortality in patients with aortic stenosis was 6.49% ($n=5$) and long-term mortality (following 21 months) 3.9% ($n=3$). Respectively, in patients subjected to aortic valve replacement due to aortic regurgitation early mortality was 6.25% ($n=6$) and long-term - 8.0% ($n=6$). On the basis of statistical analysis authors selected predictors of increased mortality in these groups of patients (e.g. high BMI, postoperative AF, and low output syndrome for AS, and e.g. high BMI, pre- and postoperative LVEF, LVESd and LVEDd and postoperative LCOS). Among these predictors it was observed that, in patients with aortic regurgitation, essential hypertension (grade 2 or 3 according to ESH/ESC 2007 guidelines) was an independent risk factor of death, both in the early postoperative period (OR 3.2; 95% CI 2.4-5.7; $P<0.001$), and in long-term observation ($P<0.05$). Similarly results were noticed analyzing all deaths during the observation period essential hypertension was an independent risk factor of death in patients with aortic regurgitation subjected to aortic valve replacement (OR 2.9; 95% CI 1.9-4.7; $P<0.001$). In patients with aortic stenosis subjected to AVR we did not notice such correlation.

Conclusions: In conclusion, essential hypertension was an independent predictor of death in patients with aortic regurgitation subjected to AVR. All patients with essential hypertension undergoing cardiac surgery should be treated as high risk patients of postoperative complications, and the optimal hypotensive treatment should be implemented in order to effectively reduce the preoperative blood pressure. Further studies are necessary to confirm these results.

C6-9

HEMODYNAMICS OF TRANSCATHETER AORTIC VALVE STENOSIS

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Objectives: Transcatheter aortic valves (TAV) present a minimally invasive treatment for high risk surgical patients with severe aortic stenosis. However, their long-term safety and durability are unknown. The objective of this study is to evaluate hemodynamic changes within TAV created by bioprosthetic leaflet degeneration.

Methods: Computational fluid dynamics simulations were performed to evaluate the hemodynamics through normal, mildly and severely stenosed TAV. A three-dimensional surface mesh of the TAV within the aortic root was generated for each simulation. Leaflets were contained within an open, cylindrical body without attachment to the sinus commissures representing the stent. A continuous surface between the annulus and TAV excluded the geometry of the native calcified leaflets and prevented paravalvular leak. Unsteady control volume analysis (320 computational steps per second) throughout systole was used to calculate fluid velocity, and shear and total force on the solid elements.

Results: Mild stenosis increased total force on the TAV by over 60% (0.602-0.98 N), severe stenosis another 80% (1.79 N). For all three simulations, 99% of the calculated force was in the direction of axial flow, along the ventricular surface of the prosthetic leaflets. Shear stresses on both the TAV and aortic root were greatest during peak systolic flow. Shear stress was greatest immediately below the sinotubular junction of the aorta and on the tips of the leaflets of the TAV. Average shear stress throughout systole increased during mild stenosis, but the peak and profile of stress distribution were unaltered. This result indicates that the aortic root geometry and physiologic flow dominate location and magnitude of shear. This result is no longer observed once the TAV has been severely stenosed. A dramatic increase in peak leaflet shear stress was observed (120 KPa severe vs. 45 KPa normal/mild) and the stress profile was dictated by the shape of the stenosis not the sinus.

Conclusions: Shear stress has long been recognized as a mechanism of leaflet degeneration and can lead to stent migration over time. Stenosis leads to significant forces of TAV during systole. Significant changes in shear stress do not occur until severe stenosis, but even mild stenosis causes a significant increase in total force. As the first implanted TAV begin to stenose, the authors recommend watchful examination for device failure.

April 25th, 2008 2nd Congress Day

16:30-18:30

7th Cardiac Scientific Session - ESCVS Young Cardiac Surgeon Prize

C7-1

LONG-TERM FOLLOW-UP OF POST INFARCT LEFT VENTRICULAR ANEURYSMS

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Objectives: Long-term follow-up of 27 patients with post infarct left ventricular aneurysms operated over a period of 12 years from 1995-2007. Twenty (74%) were males and 7 (2.6%) were females. Age ranged from 50 to 70 years. Six (2.2%) had single vessel disease, 13 (48.1%) had double vessel disease and 4 (1.5%) had triple vessel disease. Six patients (2.2%) were diabetics, 10 patients (37%) were smokers and 18 patients (66.7%) were hypertensive. Twenty-five patients (92.6%) were operated electively and two patients (0.7%) within 15 days of acute myocardial infarction. Two patients (0.74%) died immediate postoperative period due to low cardiac output and arrhythmias. Follow-up was done over a period of 2-6 years by clinical examination and 2D echocardiography.

Methods: Twenty-seven patients underwent surgery for left ventricular aneurysm. All were approached by median sternotomy incision. Aortic cannulation was done after heparinisation (3 mg/kg). Aortic canula (Sarns metal, USA) and Bicaval cannulation (Cal Med, Edwards-USA) was employed. Membrane oxygenators (Polystan, Dideco) were used in all patients. After cross-clamping aorta, blood cardioplegia was used in all patients. Aortic cross-clamp time varied from 40 to 90 min and bypass time varied from 90 to 120 min. Aneurysm was resected and sutured with 2/0 prolene and teflon felt reinforcement. Total number of grafts were 36. Inotropic support with adrenaline, dopamine or dobutamine was given for all patients. IABP was employed in 24 patients. All patients were electively ventilated for 24-48 h. Three patients (1.1%) required re exploration due to bleeding. Five (1.85%) patients had mild MR which was left alone.

Results: Twenty-seven patients were operated for left ventricular aneurysm over a period of 12 years. Two patients (0.7%) died postoperatively due to low cardiac output and arrhythmias. Follow up was done clinically and with 2D Echocardiography. At the end of two years, 11 patients (40.7%) showed no improvement in LVEF, 16 patients (59.2%), LVEF improved by 10-15%. All patients required decongestive management. Three patients died at the end of two years.

Conclusions: Timely surgery for left ventricular aneurysms can be done with acceptable mortality and morbidity.

C7-2

PLASMA LEVEL OF MATRIX METALLOPROTEINASE-9 IS INCREASED IN PATIENTS OPERATED ON CORONARY ARTERY DISEASE USING ON-PUMP TECHNIQUE (CABG) BUT NOT OFF-PUMP (OPCAB)

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Objectives: Extracorporeal circulation (ECC) in CABG is associated with the systemic inflammatory response syndrome (SIRS). Matrix metalloproteinases (MMPs) including gelatinases (MMP-2 and MMP-9) are important mediators of inflammation and their up-regulation has been reported in CABG. Complications of OPCAB may be lower than those of CABG. The objective of this study was to measure plasma and myocardial MMP-2 and MMP-9 levels in patients undergoing OPCAB and CABG.

Methods: Thirty-two patients were enrolled into the study: 16 patients operated on CAD with ECC (CABG), and 16 patients without ECC (OPCAB). In CABG blood was collected at the beginning of the operation (A), before ECC initiation (B), at the aortic declamping (C), after ECC (D), 30 min (E), 6 (F) and 12 h (G) after ECC. In OPCAB group blood was collected in equivalent time points: at the beginning of the operation (A), after harvesting of RITA/SVG/RA (B), after completion of distal anastomoses (C), after proximal anastomoses (D), 30 min (E), 6 (F) and 12 h (G) after grafting. The right atrial auricle biopsies were collected before and after ECC in CABG and after harvesting and completion of proximal anastomoses in OPCAB.

MMPs (total pro and activated MMP-2 and MMP-9) in plasma and myocardium were measured in samples (20 µg protein) by zymography and quantified using gel documentation system. Myeloperoxidase (MPO, a specific granulocyte marker) was measured using commercially available ELISA kit.

Results: There were no significant differences ($P>0.05$) in age, gender, LVEF and EuroSCORE between CABG and OPCAB patients. CABG, but not OPCAB, led to a significant increase in plasma MMP-9 levels that peaked at time point D. A small, but significant, increase in MMP-2 levels was detected both in CABG and OPCAB (Fig. 1b). The levels of MMP-9 in biopsies significantly increased at point D of CABG and OPCAB. In contrast, the levels of MMP-2 were not significantly changed in atria during CABG and OPCAB. The MMP-9 content in plasma at point D correlated with MPO plasma concentration ($r^2=0.8212$, $P<0.05$).

Conclusions: 1. Systemic MMP-9 levels greatly (700-900 fold) increased during and directly after CABG, but not OPCAB. 2. Myocardial MMP-9 levels increased both in CABG and OPCAB indicating that local MMP-9 up-regulation is common for both types of surgery. 3. The correlation of plasma MMP-9 with MPO suggests that MMP-9 was released by activated granulocytes during ECC. 4. Thus, the ECC-mediated increase in systemic MMP-9 levels may contribute to the pathogenesis of SIRS.

C7-3

PREOPERATIVE ANGIOTENSIN-CONVERTING ENZYME INHIBITORS PROTECT MYOCARDIUM FROM ISCHEMIA DURING CORONARY ARTERY BYPASS GRAFT SURGERY

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Objectives: Coronary artery bypass graft (CABG) surgery may result in perioperative myocardium injury during cardioplegic arrest. Angiotensin-converting enzyme (ACE) inhibitors protect myocardium from ischemia in several clinical conditions but no previous study has attempted to evaluate the impact of preoperative ACE inhibitor therapy on myocardium protection in patients undergoing CABG surgery.

Methods: A propensity score-based analysis of 481 patients undergoing isolated on pump CABG surgery. Two hundred and forty-five patients received preoperative ACE inhibitors and 236 were not treated with ACE inhibitors. Peri-operative myocardial injury was assessed by ischemia marker cardiac troponin I (cTnI).

Results: Preoperative cTnI concentration was similar for patients receiving ACE inhibitors and patients who did not (0.1 ng/ml [0.06-0.19] vs. 0.1 ng/ml [0.06-0.19]; $P=0.3$). At ICU admission, cTnI concentration was lower in patients receiving preoperative ACE inhibitors (0.8 ng/ml [0.44-0.1.35] vs. 0.96 ng/ml [0.50-1.89]; $P=0.03$) and this difference was more evident at the 1st (1.6 ng/ml [1.05-3.4] vs. 2.4 ng/ml [1.13-6.10]; $P=0.0006$) and 2nd postoperative day (0.8 ng/ml [0.5-1.8] vs. 1.4 ng/ml [0.64-3.98]; $P=0.0015$). After adjusting for propensity score and covariates, preoperative ACE inhibitors were found to decrease postoperative cTnI peak concentration ($B=-0.12$; $P=0.004$). Other independent predictors of postoperative cTnI peak concentration were female gender ($B=0.15$; $P=0.009$), emergency surgery ($B=0.20$; $P=0.003$), number of distal anastomoses ($B=0.08$; $P=0.03$) and aortic cross clamp time ($B=0.002$; $P=0.03$).

Conclusions: ACE inhibitors prior to surgery may add myocardial protection during surgical revascularization. Prospective, randomized clinical trials will be necessary to better define the role of ACE inhibitors in improving outcomes when they are prescribed prior to CABG surgery.

C7-4

REGULATION OF INFLAMMATORY CYTOKINES AND PROTEIN ADSORPTION DURING CARDIOPULMONARY BYPASS; ROLE OF ALLOGENIC RED BLOOD CELL TRANSFUSION AND POLYMETHOXYETHYLACRYLATE-COATED CIRCUIT SYSTEMS

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Objectives: This study is designed to determine and compare the effects of transfusion and use of coated circuits on the systemic inflammatory response and protein adsorption of the circuit surface during cardiopulmonary bypass.

Methods: Alterations in the inflammatory parameters and protein adsorption were observed in 40 patients undergoing elective coronary bypass surgery

with CPB. Patients were prospectively enrolled equally in to four groups (group 1: patients who received no red blood cell (RBC) during CPB with using standard oxygenator, group 2: patients who received at least 1 RBC during CPB with standard oxygenator, group 3: patients who received no RBC during CPB with coated oxygenator, group 4: patients who received at least 1 RBC during CPB with coated oxygenator). Serum lactate, interleukin-6 (IL-6), human tumor necrosis factor alpha (TNF-alpha), D-dimer and CRP levels were measured at three different time points (T1: before cardiopulmonary bypass, T2: after aortic cross clamping, T3: after the administration of protamine).

Results: Basal (T1) measurements of TNF-alpha, IL-6, D-dimer, CRP and lactate were similar between groups. These parameters were increased at T2 and T3 in all groups ($P<0.05$ within groups); measurements of all were the highest at T3 in group 2 (with transfusion and no coating) and lowest at group 3 (with no transfusion and coating) when compared to the other groups ($P<0.05$). Anova test for repeated measurements revealed that the increase in IL-6 was significantly higher at T2 in group 2 when compared to group 1 ($P=0.03$). The increase in TNF-alpha was significantly higher at T2 in group 1 when compared to group 3 ($P<0.05$). The increase in D-dimer was significantly higher at T3 in group 2 when compared to group 3 ($P=0.04$). Lactate levels were increased at T2 and T3 significantly at group 1 when compared to group 4 ($P=0.02$ at T2 and T3). The measured protein adsorption was higher in group 1 and group 2 (group 1 vs. group 3; $P=0.01$, group 2 vs. group 3; $P=0.02$, group 2 vs. group 4; $P=0.04$). It was also higher at group 4 when compared to group 3 ($P=0.03$). ICU stay time and intubation time was shorter in groups with coated circuits ($P<0.05$ between group 4 vs. group 2 and group 3 vs. group 2) and the ones with no transfusion ($P<0.05$ between group 1 vs. group 2 and group 3 vs. group 4).

Conclusions: There is an increased inflammatory response after cardiopulmonary bypass. Allogenic red blood cell transfusion attenuates this inflammatory response and increases the surface protein adsorption. The use of polymethoxyethylacrylate-coated circuit systems has a limiting effect on these processes. The combination of transfusion and not using a coated system has the highest risk for increased inflammatory response and protein adsorption.

April 25th, 2008 2nd Congress Day

16:30-18:30

3rd bis Vascular Scientific Session - ESCVS Young Vascular Surgeon Prize

V3bis-1

SURGICAL MANAGEMENT OF CAROTID BODY TUMOR (CBT): NEW DIAGNOSTIC TOOL AND MULTIDISCIPLINARY APPROACH

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Objectives: Management of CBT is difficult in both diagnosis and treatment especially when patient is asymptomatic or the tumor is associated with multiple paragangliomas. In this study we analyzed patients treated for neck paraganglioma to evaluate the necessity of preoperative genetic studies and a multidisciplinary approach for correct surgical management.

Methods: Sixteen patients admitted to our institution between January 1986 and December 2007 surgical treated for cervical paraganglioma resection was analyzed. Only in one patient, with more than 6 cm mass, preoperative embolization was performed. Genetic study for SDH mutations was collected for all patients but only from 2003 (6 TGC) like part of preoperative diagnostic tool. Clinical data and follow-up were collected prospectively and analyzed retrospectively. Statistical data are shown as mean values and standard deviation.

Results: Of the 16 patients with a mean age of 54.1±15.8 years there were 12 (75%) female and 4 (25%) male. At time of diagnosis two patients (12.5%) presented with bilateral CBT and one with clinical history of multiple paraganglioma (0.6%). Four patients (25%) tested positive for SDHB and D gene mutation; one sporadic monolateral CBT, one multiple paraganglioma and in two patients with bilateral CBT. Major stroke or important cranial nerve lesions did not occur in any case. Reversible cranial nerve lesions occurred

in four patients; intraoperative limited blood loss in one subject. In one case internal carotid artery reconstruction was performed. Histological analysis showed benign paraganglioma in all 16 patients and no malignant form were reported. After a follow-up of 3 to 195 months (mean 86.0±57.2) 15 patients were free of disease with no evidence for local recurrence whereas one patient was lost to follow-up.

Conclusions: In a cohort of 16 patients consecutively referred with cervical paraganglioma, in all cases with multiple presentation we identified an SDH gene mutation; in two of those patients genetic test was an important tool for diagnosis and choice of treatment. Tumor surgical excision gave excellent postoperative results when classified Shamblin class I or II. Long-term survival in patients after surgical removal of CBT appears not limited. In conclusion SDHB, SDHC and SDHD molecular screening is mandatory in patients with bilateral CBT presentation and should be recommended in patient's families and in cases of sporadic CBT too also for guiding surgical way of treatment. CBT is a rare condition which needs accurate preoperative multidisciplinary evaluation and surgical excision by experienced vascular surgeon.

V3bis-2

EXPERIMENTAL AORTIC REPLACEMENT IN A RAT MODEL WITH DEGRADABLE SYNTHETIC VASCULAR PROSTHESIS

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Objectives: Vascular tissue engineering necessitates a degradable scaffold. The purpose of this study was to evaluate biocompatibility, patency and mechanical properties of the following electrospun degradable polymer grafts: poly-dioxanone (PDO) alone, mixed with poly-lactic-acid (PDO-PLA), and mixed with polycaprolactone (PDO-PCL).

Methods: In 30 anaesthetised Sprague Dawley rats, 2 mm ePTFE grafts (controls $n=9$), 1.5 mm PDO ($n=3$), 1.5 mm PDO-PLA ($n=9$) and 1.5 mm PDO-PCL ($n=9$), were interposed in the infrarenal abdominal aorta and followed for a period of 3, 6 and 12 weeks. Digital subtraction angiography was performed for patency, stenosis and aneurysmal dilatation assessment before euthanasia and grafts were harvested for morphologic as well as scanning electron microscopic examination.

Results: Patency rates were excellent for all types of grafts (100%) and no relevant stenoses were found. Angiography follow-up showed 100% aneurysmal dilatation for PDO alone at 3 weeks (therefore, no further implantations were carried out) and no aneurysmal dilatation for PDO-PCL grafts. Morphometric and planimetric studies showed that the neo-endothelization of the graft at 12 weeks is significantly better for PDO-PLA and PDO-PCL grafts vs. ePTFE ($P<0.05$ Mann-Whitney U -Test).

Conclusions: Patency of electrospun PDO, PDO-PLA, PDO-PCL grafts is excellent. Aneurysm formation represents a major problem for degradable synthetic vascular grafts (PDO). Therefore, combinations of PDO with slower degrading polymers, such as PCL seems to eliminate aneurysm formation in small calibre vascular prosthesis. Electrospun random nanofibre PDO-based polymers may be promising materials for vascular tissue engineering.

V3bis-3

OPEN REPAIR VS. ENDOVASCULAR TREATMENT WITH COVERED STENT FOR SUPERFICIAL FEMORAL ARTERY OCCLUSION: PRELIMINARY RESULTS OF A PROSPECTIVE RANDOMIZED STUDY

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Objectives: This randomized prospective study was designed to compare the effectiveness of treating superficial femoral artery occlusive disease (SFAOD) with expanded polytetrafluoroethylene (ePTFE)/nitinol self-expanding stent-grafts vs. surgical femoral-to-above knee popliteal (AKP) artery bypass. The main end-point of the study was primary and secondary patency rate.

Methods: From March 2006 to November 2007, 45 patients with SFAOD were enrolled in the study. Fourteen patients were excluded for poor distal

run-off, contraindication to anti-platelet, anti-coagulant or thrombolytic therapy. Patients had symptoms ranging from claudication to rest pain, with or without tissue loss. Once admitted in the study they were prospectively randomized into the two arms of treatment: 24 patients to open repair (OR) that underwent a femoro-AKP artery bypass using homologous great saphenous vein or ePTFE grafts and 21 patients to endovascular treatment (ET) in which a Viabahn® endograft was deployed. Associated procedures were: endarterectomy of the common and profunda femoral artery in six patients of OR (25%) and in four of ET group (19.1%) and PTA of a tibial artery performed in three cases (14.3%) after the endograft deployment. Follow-up was based on clinical evaluation and color flow duplex sonography performed at 3, 6, 9, and 12 months and then every six month after treatment. A restenosis >60% was considered a failure of the procedure.

Results: No statistical differences were observed for primary and secondary patency rate between the two treatment groups both in the early and middle term results. At 30 days the primary and secondary patency rate were 100% for OR and 95.2% for ET. One endograft occluded 72 h after the procedure in a patient with a concomitant profunda endarterectomy, the thrombolytic therapy failed and no adjunctive procedure was performed. At 20 months the primary patency rate was of 83.2% for OR (two bypass occlusion) and of 73.7% for ET (two endograft occlusion and one restenosis >60%), with a secondary patency rate, respectively, of 90.7% and 80.2%.

Conclusions: Results of this preliminary study seem to show that the management of SFAOD with covered stent-graft is a safe procedure with comparable results to OR with conventional femoral-to-AKP artery bypass. Larger studies with longer follow-up are required to establish the role of ET in the management of SFAOD.

V3bis-4

ENDOVASCULAR TREATMENT OF ACUTE TRAUMATIC AORTIC INJURIES: A RETROSPECTIVE ANALYSIS OF 20 CASES

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Objectives: To report a 10 year experience in the endovascular treatment of acute traumatic thoracic aorta rupture in our hospital.

Methods: We reviewed 20 patients with an acute traumatic thoracic aorta lesion treated with a thoracic endograft between August 1997 and July 2007. All were multitrauma patients, victims of high velocity accidents or accidents with great impact. The diagnosis of aortic injury was made on clinical basis and conventional imaging, confirmed by computed tomographic angiography (CTA). The following parameters were studied: age, sex, type and site of the lesion, type of endovascular graft, endovascular operation time, length of stay in the intensive care unit (ICU), length of stay in the hospital, immediate and peri-operative complications and mortality. In addition, we recorded follow-up data consisting of clinical visit, computed tomographic angiography (CTA) and plain chest radiographs at regular intervals (3rd, 6th and 12th month and later, every subsequent year). Median follow-up was of 58 months.

Results: All endovascular procedures were technically successful, and the median operating time for the endovascular procedure was 74 min (range 55-130 min). We recorded an external iliac lesion during the procedure as unique immediate complication and was corrected by an ilio-femoral bypass. The only peri-operative death (peri-operative mortality rate of 4%) was unrelated to the aortic rupture or stent placement. There was no intervention-related mortality during the follow-up. Postoperative data showed no severe endovascular graft- or procedure-related morbidity. We recorded two cases of stent fracture, diagnosed by chest radiograph and CTA, without clinical impact or signs of endoleak.

Conclusions: Short- and mid-term results of immediate endovascular repair of traumatic aortic injuries are very promising, especially when compared with open surgical treatment. This induces us to consider endovascular therapy preferable in these multitrauma patients with traumatic ruptures of the thoracic aorta. Nevertheless, long-term follow-up data are necessary for assessing the overall durability of this procedure, considering the young age of these patients. The long-term follow-up results will determine whether the endovascular treatment should replace open surgery as first-line therapy in thoracic aortic injuries.

V3bis-5

CLINICAL AND ANATOMIC PROGNOSTIC FACTORS ON THE ENDOVASCULAR AND OPEN REPAIR OF RUPTURED AAA

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Objectives: To analyze which factors are associated with rAAA mortality and if there was any impact after the introduction of endovascular emergency repair on the prognosis of the disease.

Methods: Eighty-two patients diagnosed of rAAA between January 2003 and September 2007 were enrolled prospectively. Fifty-one of those were submitted to emergent surgery (14 endografts and 37 on an open fashion). Clinical data and blood samples were taken to calculate the Glasgow Aneurysm Score (GAS). Arterial and aneurysm diameters, type and area of rupture were assessed on presurgery CT scan. Surgical parameters, perioperative evolution and 3-month follow-up were also collected. Two groups were established to assess the impact of endovascular emergent repair: 2003-2004 and 2005-2007 (after introduction of emergency EVAR).

Results: A significant association was found between death and: location and type of rupture, aortic diameter, GAS, time to reach emergency department and technique used for repair (endovascular/open). There were no significant differences in survival between the two time periods analyzed both in the group submitted to surgery and on the whole series. The clinical-anatomic most lethal combination was (accounting 2 out of 3): GAS>92 (percentil 75), retroperitoneal posterior rupture with active bleeding (RAP) on CT scan and a time to reach emergency higher than 20 h after the onset of symptoms, which summoned a 100% (7/7) mortality on the operated group ($P=0.0072$). Suprarenal aneurysm perisurgical mortality (12 cases, 3 operated) was also 100%.

Conclusions: Emergency endovascular repair of a rAAA decreases operative mortality. The combination of a high GAS score, a retroperitoneal active bleeding and a delay on the arrival to hospital or the presence of a suprarenal aneurysm may predict a nule survival.

V3bis-6

THE ROLE OF CISTATIN-C IN MONITORING POSTOPERATIVE RENAL FUNCTION AFTER EVAR: PRELIMINARY RESULTS OF A PROSPECTIVE STUDY

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Objectives: After EVAR an impairment of renal function (RF) has been observed in 3-5% of patients when it is study with biochemical marker such as serum creatinine (SCr), this percentage of patients increase to 8-10% when a more sensible test as renal perfusion scintigraphy (RPS) is used. Recently a new biochemical marker has been introduced to detect renal function: cystatin-C. The aim of the study was to evaluate the role of cystatin-C in monitoring renal function after EVAR by comparing it with SCr and RPS.

Methods: From June 2007 to January 2007 a prospective comparative study was performed at the Department of Vascular and Endovascular Surgery of Padua University, during this period 20 consecutive patients underwent EVAR for AAA and were enrolled in the study. The preoperative and postoperative (3rd postoperative day) protocol included the dosage of SCr, cystatin-C; at the same time point a RPS was performed as parameter of control of the glomerular filtration rate (GFR). Furthermore the RPS is able to evaluate separately the GFR of each kidney. A variation of SCr, cystatin-C, CrCl, CcCl or of the GFR at the RPS >20% from base line was considered relevant.

Results: No significant variation of the mean value of biochemical marker of renal function were observed from base-line to postoperative period. SCr ranged from 1.05 ± 0.2 to 1.15 ± 0.3 (9.06% of variation from base-line), cystatin-C from 1.087 ± 0.2 to 1.086 ± 0.2 (0.09% of variation from base-line); the GFR at the RPS ranged from 65.3 ± 16.7 to 63.8 ± 12.8 (2.29% of variation from base-line). Analyzing the results of biochemical marker and of RPS in every single patient in 3 (15%) a significant variation (>20%) of the GFR was observed in absence of a significant variation of SCr and cystatin-C. In 2 (10%) of these patients the RF impairment was limited to a single kidney. Moreover, the RPS showed in other 2 (10%) patients a significant impairment of the GFR (>20%) limited to a single kidney without a significant variation of the total GFR.

Conclusions: Results of the study showed that cystatin-C as SCr are not useful markers in identifying RF impairment after EVAR. In fact in the 3 (15%) cases with a significant impairment of total GFR and consequently in the 2 (20%) with a GFR decrease limited to a single kidney, non-significant variation of cystatin-C or SCr were observed.

V3bis-7

OPEN REPAIR FOR RUPTURED ABDOMINAL AORTIC ANEURYSM: IS IT POSSIBLE TO PREDICT SURVIVAL?C. Maturi, M. Antonello, A. Segalla, I. Morelli, S. Bonvini, F. Grego, G.P. Deriu
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Objectives: The aim of the study was to determine variables that could be used to predict survival in patients with ruptured abdominal aortic aneurysm (RAA) and to assess the accuracy of Glasgow Aneurysm Score (GAS) and APACHE II.

Methods: Data of all patients admitted at the Department of Vascular and Endovascular Surgery of the University of Padua for a RAA between January 1998 and July 2006 were retrospectively collected in a data-base and thereafter analyzed. A RAA was defined as a defect in the aneurysmal wall, that had allowed the extravasation of a quantity of blood. For each patient, 44 variables were recorded, analyzed and divided in to three subgroups: preoperative, intraoperative and postoperative. In the preoperative subgroup the analysis was completed with the GAS and in the postoperative with the APACHE-II score. Data were analyzed by both univariate and multivariate methods and performed using SPSS software, version 13.0 (SPSS Inc., Chicago, Illinois). To compare dead vs. alive patients we used Student *t*-test for continuous variables and Fisher Exact test for categorical ones. Stepwise logistic regression was used to estimate the independent Odds Ratio, and their confidence interval, of a optimized subset of predictor variables significantly associated to death in univariate analysis.

Results: During the study period, 1141 patients underwent an AAA repair. The elective procedures were 1008, and 251 (24.9%) of these were endovascular; 169 (16.7%) patients underwent emergency operations for symptomatic AAA, of which 116 had an evidence of rupture. Thirteen patients were excluded from the study, due to missing data for most of the prognostic variables. There were 82 men and 21 women. The mean age was 72.9 years, ranging from 47 to 91-years-old. At the univariate analysis significant predictors of death were: hypotension ($P=0.001$), pre-existing peripheral vascular disease ($P<0.001$), renal insufficiency ($P=0.037$) and chronic obstructive pulmonary disease ($P=0.028$), the level of HCO_3^- ($P<0.001$), intra-peritoneal rupture ($P=0.001$), blood transfused ($P<0.001$), cardiac complications ($P<0.001$), and Apache II score ($P=0.001$). Multivariate analysis confirmed a statistical significance for coexisting peripheral vascular disease ($P<0.001$), diastolic blood pressure at admission <60 mmHg ($P=0.039$), APACHE II score >18.5 ($P=0.025$), HCO_3^- <21 mg/dl ($P<0.001$) and intra-peritoneal rupture of the aneurysm ($P=0.011$) as predictors of death.

Conclusions: Results of the study suggested that different factors can be helpful in identifying those patients whose operative risk is prohibitive. The APACHE II, contrary to GAS, is an accurate system to predict postoperative death after repair for RAA.

V3bis-8

AT THE ORIGIN OF PERIPHERAL ARTERIAL DISEASE: ROLE OF ENDOTHELIN IN ENDOTHELIAL DYSFUNCTION

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Objectives: Endothelin-1(ET-1) is a powerful vasoconstrictor agent produced by the endothelial cells as response to different stress stimuli.

We aimed to define the role of Endothelin-1(ET-1) in Peripheral Arterial Disease (PAD) and to determine the relationship between ET-1 circulating levels and the endothelial function assessed by the flow mediated arterial dilation (FMAD), as well as to find out the association of the ET-1 with the clinical presentation of the disease and the inflammatory processes acting in atherosclerosis.

Methods: We carried out a study with a group of 103 patients with clinical PAD and a control group with 38 healthy people. We estimated the endothelial function measuring the FMAD in the brachial artery in all the enrolled individuals. We analyzed the C-Reactive Protein plasma level, as an inflammatory marker in cardiovascular diseases, and measured the ET-1 serum level using the ELISA method. The sample size was calculated for this study with a statistical power of 0.8 and an Alfa error of 0.5.

Results: We found significant differences in ET-1 plasma levels between the patients and the control group ($8.76 \text{ pmol/l} \pm 7.1$ vs. $6.45 \text{ pmol/l} \pm 0.89$; $P=0.002$). The analysis of the pooled sample by clinical stage showed significant differences in ET-1 levels regarding the severity of the PAD ($10.97 \text{ pmol} \pm 7.9$ in patients with intermittent claudication vs. $4.82 \text{ pmol/l} \pm 2.57$

in critical limb ischemia; $P<0.001$). There were no differences in regard to age, genre, cardiovascular risk factors, FMAD and Nitric Oxide plasma levels between the patient groups according to their clinical presentation. Otherwise, we did find significantly differences in hsPCR levels depending on the clinical severity (4.73 [3.32; 7.37] mg/l in the claudication group vs. 16.94 [5.6; 66.37] mg/l in critical ischemia group; $P=0.001$). In the other hand, the correlation coefficient between the ET-1 plasma levels and FMAD measurements was almost valueless ($r=0.040$; $P=0.68$)

Conclusions: Endothelin-1(ET-1) might play a triggering role in Peripheral Arterial Disease, as its elevated plasma levels in the early stages don't increase with the clinical severity progression of the disease.

V3bis-9

UPPER EXTREMITY ARTERIAL INJURIES: FACTORS INFLUENCING TREATMENT OUTCOME

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Objectives: The aim of the study was to identify the factors influencing surgical treatment outcome following upper extremity arterial injuries.

Methods: This 15-year study included 167 patients with 189 civilian, iatrogenic and war upper extremity arterial injuries requiring surgical intervention. Patient data were prospectively entered into Vascular trauma database and retrospectively analyzed. There were 31 (18.6%) war, 120 (71.8%) civilian and 16 (9.6%) iatrogenic injuries. The most frequently injured vessel was the brachial artery (55% of the injuries), followed by the axillary (21.7%), antebrachial (21.2%) and subclavian (2.1%) arteries. Associated skeletal, neural and venous injuries of the ipsilateral upper extremity were present in 64.7% of the cases. The presence of hard signs of arterial injury was diagnostic in majority of the cases. Additional, arteriography and Duplex ultrasonography were performed in 36.5% and 19.2% of the cases, respectively. The majority of arterial reconstructions were performed with the use of saphenous vein graft (55.7%). Fasciotomy was required in 9.6% of the patients.

Results: The operative mortality was 2.4%. Three primary amputations (1.8%) were performed due to extensive soft tissue destruction and signs of irreversible ischemia on admission. Seven secondary amputations (4.2%) were due to graft failure, infection, anastomotic disruption or the extent of soft tissue and nerve damage. Early graft failure, compartment syndrome, polytrauma, skeletal, brachial plexus injuries and war injuries were found to be significant risk factors for amputation after upper extremity arterial injury ($P<0.01$).

Conclusions: Although the careful physical examination should diagnose the majority of upper extremity arterial injuries, the use of angiography is helpful in establishing the localization and extent of the injuries. Prompt and adequate reconstruction of arterial injuries is essential for optimal results. Traumatic nerve injuries are the primary cause of long-term functional disability.

V3bis-10

GENERATION AND VERIFICATION OF RISK PREDICTION MODELS FOR CAROTID ENDARTERECTOMY USING DATA MINING AND NEURAL NETWORK TECHNIQUES

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Objectives: Existing risk models for risk prediction fail to predict individual patients risk. The aim of this study was to use data mining and neural network (NN) techniques to improve risk prediction for Carotid endarterectomy (CEA).

Methods: The data set of 840 CEAs derived from two vascular units, five vascular surgeons prospectively collected over six years was available. The outcome end points were the occurrence of stroke or death within 30 days. Data was split for training and cross validation (500) and test set (340). Three supervised NN techniques (Multi layer perceptions, Radial basis function and Support vector machines) were used. Ten fold cross validation technique was used as internal validation on WEKA data mining software. Later on K Mix algorithm was used to cluster input data. Sensitivities and specificities were compared to the NNs using confusion matrixes

Results: Low sensitivities (0.13-0.27) but high specificities (0.85) were obtained with supervised NNs with out K Mix. High sensitivities (1.0) and specificities (0.99) were obtained with K mix generated supervised NNs.

Conclusions: The use of data mining methods (KMix) to cluster input data first improved predictive accuracy of NNs for CEA. Further validation on independent data set is necessary before clinical use.

V3bis-11

VASCULAR ACCESS FOR HEMODIALYSIS IN PATIENTS WITH CENTRAL VEINS THROMBOSIS

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Objectives: Dialysis dependent patients have often central venous drainage problems, usually due to percutaneous vein catheterization. In case of functioning arm arterio-venous fistula outflow thrombosis can be the reason of venous hypertension, arm edema and vascular access failure. Percutaneous angioplasty and stenting of narrowed vessels is sometimes not sufficient.

In such circumstances there is the possibility to create new fistula with venous anastomosis to subclavian or iliac vein, superior or inferior vena cava. In case of existing fistula failure, it is possible to create veno-venous graft to bypass the thrombosed vein. The aim of the study was to assess the possibility of creation and function of arterio-venous fistula with the outflow to central veins.

Methods: Between 1990 and 2007 in our Department 49 patients with central veins occlusion were treated. Mean age was 43 years (range 19-64 years), mean duration of hemodialysis was 4.2 years (range 16 months to 6 years), mean number of previous vascular access surgery was 7.6 (3-17). We performed 19 axillo-iliac, 14 axillo-axillary bypasses and 16 conduits from arm fistula to jugular (9) or subclavian (7) vein for hemodialysis purposes. We used 5 or 6 mm diameter external supported PTFE grafts.

Results: All except one fistulas were used for hemodialysis. One patient died with good function of fistula before it is initial usage. Follow-up period ranged from 1 to 84 months. In four cases of stenosis of venous anastomosis occurred (8, 12, 14 and 16 months postoperatively), two of which were successfully treated by angioplasty and one required a new anastomosis to the inferior vena cava. In 12 cases (24%) graft thrombectomy was necessary 1 to 38 months after the operation. One axillo-iliac and one axillo-axillary bypass was removed 14 and 22 months after the operation due to infection.

Conclusions: In conclusion we found extraanatomic conduits an efficient option as a permanent vascular access for hemodialysis purposes in patients with central venous occlusion.

V3bis-12

NITRIC OXIDE: THE HINGE BETWEEN ENDOTHELIAL DYSFUNCTION AND INFLAMMATION IN PERIPHERAL ARTERIAL OCCLUSIVE DISEASE PATIENTS

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Objectives: To analyse the role of the nitric oxide (NO) plays in the peripheral arterial occlusive disease (PAOD) pathogeny and its relation with inflammation processes at the origin and development of the disease as well as the nitric oxide concerns on the endothelial dysfunction characterized by the flow-mediated dilation (FMD) of the brachial artery.

Methods: We carried out a cross-sectional study in our population randomizing a sample sized in 123 subjects. The nitrites serum levels were determined using a flow-injection analysis based on the Griess reaction. The variables flow-mediated dilation (FMD) of the brachial artery, the high sensitive C-reactive protein (hsCRP) and the plasma levels of nitrites were assessed in a group of 82 patients diagnosed with PAOD and compared with the data resulted in a control group of 41 healthy subjects. In addition, we analyzed the data in the subgroups of patients regarding their clinical severity (50 Fontaine stage II and 32 Fontaine stage III-IV patients).

Results: Patients with PAOD had significantly increased plasma levels of nitrites compared with healthy control subjects (23.92 ± 23.27 M vs. 12.77 ± 11.12 M, $P=0.001$). The groups resulted by pooling the patients according the clinical severity of the disease were comparables with regard to cardiovascular risk factors and current medication. However, we did not significantly find differences in the levels of NO between both groups of patients with PAOD (25.24 ± 24.47 M vs. 21.86 ± 19.86 M, $P=0.38$). Neither we found differences between both groups in FMD ($4.7\pm 4.2\%$ vs. $4.3\pm 2.8\%$).

$P=0.1$). Values of hsCRP were significantly higher in Fontaine stages III-IV (8.2 ± 13.5 vs. 29.2 ± 33.2 , $P=0.0001$).

Conclusions: Increased levels of plasma nitrites in PAOD, as well as increased levels of hsPCR, state the inflammatory nature of the disease. No correlation of the levels of NO with the severity of the PAOD, as well as it occurs in FMD, supports the hypothesis that endothelial dysfunction is a fact that happens in the earliest stages of the disease, and not this way the inflammation events that do act in the progression of the PAOD.

V3bis-13

SERUM LEVELS OF ADHESION MOLECULES AS A MARKER OF DEVELOPMENT OF ABDOMINAL AORTIC ANEURYSMS (AAA) - AN EXPERIMENTAL MODEL

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Objectives: Research in the field of the etiopathogenesis of abdominal aortic aneurysm (AAA) continues in many spheres. One of the most important areas is experimental aneurysm modeling in animals and their further evaluation. It seems that one of the most important factors for AAA formation are the inflammatory reactions proceeding in the aortic wall. Adhesion molecules are probably markers which play very important role in this process. The aim of our experimental work was to determine the dynamics of the soluble forms of two adhesion molecules (VCAM-vascular cell adhesion molecule and ICAM-intercellular adhesion molecule) in animal experimental AAA model during the formation of the aneurysm itself.

Methods: Twelve experimental domestic piglets were used for the experiment. Animals were divided into two groups. In the group A (7 animals) we used our own method for creation of AAA by combination of the classic Anidjar/Dobrin method (intraluminal elastase infusion) with mechanical compression of abdominal aorta just below renal arteries by a plastic cuff to create a turbulent flow. Group B (5 animals) was a control group with normal abdominal aorta. The blood samples for evaluation VCAM and ICAM were taken at the beginning and 21 days after experiment. Serum from all the samples were immediately frozen at -70°C . An assay of soluble forms of VCAM and ICAM was performed in the Radioimmunoanalytical Laboratory by Enzyme-Linked Immunosorbent Assay (ELISA) using porcine antibodies. The values obtained were expressed as their mean and standard deviations. The results were statistically evaluated using Student's test and the ANOVA method.

Results: In group A we observed after 21 days typical sacciform aneurysms in all seven cases, the front-back diameter was on average 15.60 ± 1.21 mm. (measured with ultrasound). In Group A the VCAM values at the end of the experiment were significantly higher than the values at the beginning of the experiment ($P<0.0156$). The ICAM values showed no significant increase throughout the experiment ($P<0.9$). In Group B the values for both adhesion molecules, VCAM and ICAM, were comparable at the beginning as well as at the end of the experiment.

Conclusions: We demonstrated the importance of inflammatory reaction in the aortic wall for the development of AAA. The next experimental work in the field of blocking of inflammatory process in the AAA wall by specific antiinflammatory drugs should be important for clinical practice especially in patients with small AAA or patients contraindicated for elective surgical or endovascular treatment.

April 25th, 2008 2nd Congress Day

16:30-18:30

4th Vascular Scientific Session - Peripheral I

V4-1

DOES DIABETES INFLUENCE OUTCOME OF FEMORO-DISTAL BYPASS USING THE DISTAFLO PTFE GRAFT

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Objectives: Autologous vein remains the gold standard with respect to infrainguinal bypass for critical limb ischaemia. In the absence of

vein, a vein cuff or patch may be created at the distal anastomosis so that prosthetic graft is not anastomosed directly to a small distal artery. The Distaflo PTFE graft has a pre-formed hood at the distal end designed to mimic the shape of a vein cuff, enhancing haemodynamic forces and thereby reducing the risk of neointimal hyperplasia. Diabetes mellitus remains a significant risk factor for both development of arterial disease and patency rates of endovascular and surgical revascularisation. This study evaluates the value of the Distaflo graft, and whether diabetes is associated with inferior short-term outcome.

Methods: A retrospective analysis of all patients undergoing femoro-distal bypass under the care of one senior surgeon using the Distaflo graft over a six year period was performed. All patient notes were retrieved, with particular attention given to diabetic status, operation notes, angiographic findings and outcome. Cumulative patency, limb salvage and survival were estimated using Kaplan-Meier analysis. Diabetes as a specific adverse risk factor was analysed using a log-rank test.

Results: Forty-four Distaflo graft were implanted into 24 men (62%) and 15 women (38%) with mean ages of 63 and 76 years, respectively; of these 14 (36%) were diabetics. All were medicated with either antiplatelet agents or warfarin. Primary patency at one year was 28% in diabetics and 34% in non-diabetics ($P=0.24$). Secondary patency was 35% in diabetics and 34% in non-diabetics ($P=0.51$). Limb salvage rates were 51% in diabetics and 54% in non-diabetics ($P=0.23$). 30-day mortality was 7% in diabetics and 6% in non-diabetics ($P=0.99$).

Conclusions: Whilst primary patency rates appear poor, it is important to consider that the majority of these patients had undergone multiple previous procedures, and the aim was limb salvage. In this respect, the Distaflo graft would seem to have a role in patients whose only other option is major limb amputation. Results in diabetics are not significantly different to non-diabetics, and so it is appropriate to offer diabetics the same aggressive approach to limb salvage.

V4-2

FEMORODISTAL BYPASS FOR LIMB THREATENING ISCHEMIA

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Objectives: Chronic limb-threatening ischemia is a distressing pathology for the patient and surgeon. Timing of the surgery determines the mortality and morbidity rates.

Methods: We reviewed our six year experience of surgical treatment in 101 consecutive patients with limb-threatening ischemia. A total of 68 men and 33 women underwent femorodistal bypass graft replacements. Seventy patients had diabetes mellitus, 50 had coronary artery disease, 50 had Chronic obstructive pulmonary disease. All of the patients had rest pain. Fifty-two of them had distal gangrene and 42 had colour changes. Digital subtraction angiography and Doppler USG was performed in all patients. Saphenous vein was used in 83 patients, basilic vein in three patients and vascular bioprosthesis in 15 patients. Femoro-tibialis posterior bypass was performed in 41 patients. Thirty-two had femoro-tibialis anterior bypass, five had femoro-dorsalis pedis bypass. Fifteen had both tibialis anterior and tibialis posterior bypass, three had peroneal artery bypass. Five patients had only exploration. Twenty-five of the patients had additional aortobi-femoral bypass and 40 patients had femoropopliteal above knee bypass. Twenty-five of the patient had general anesthesia, 68 had regional anesthesia. Sixty saphenous procedure was performed in which 15 was insitu procedure.

Results: Seventy-five of all patients were followed for 38 months (3-60). Thirty patients had distal amputations additionally to the bypass procedure. During the early postoperative period, three patient which was performed a. tibialis posterior bypass, three patients which was performed a dorsalis pedis bypass and two patient that was performed a peronealis bypass had graft occlusion. Five of these patients suffered from embolectomy. Prostaglandin was also applied in these patients. Remaining three patient had no chance of revascularisation. All the patients had Hyperbaric oxygen treatment before and after the surgery. Graft patency was 68%. Twenty patients had additional amputations. One patient died due to myocardial infarction.

Conclusions: Chronic limb-threatening ischemia is a distressing pathology for the patient and surgeon. Femorodistal bypass surgery is a useful and effective strategy in patients with critical limb ischemia.

V4-3

THE ANGIOPLASTY OF THE PROFUNDA FEMORAL ARTERY IN THE CHRONIC CRITIC ISCHEMIA OF THE LOWER LIMBS

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Objectives: The authors report their experience on the role of the profunda femoral artery in the revascularization of the ischemic lower limb with particular reference to the indication and results obtained with Profundaplasty surgery. It is well known that the first vessel of supply in the event of superficial femoral artery obstruction is the profunda femoral artery that is capable, with its collateral branches, to create anastomosis with geniculate branches or more downstream, with the arterial branches of leg constituting a natural bypass with the popliteal and/or tibial vascular bed. In patients with obstruction of the superficial femoral and alterations of proximal segment of the profunda femoral, it is often sufficient a surgical intervention of profundaplasty to enhance the collateral circulation; it constitutes also a valid alternative to the failure or the impossibility to construct a femoro-popliteal or femoro-distal bypass. However, the success of an isolated profundaplasty is strictly connected with the run-off of the collateral network around the knee and through the tibial vessels. In patients with obstruction of the femoro-popliteal axis and/or tibial axes and it is not possible to perform a femoro-popliteal bypass or a distal bypass or they presents steno-obstructive alterations of the deep femoral artery can certainly benefit of profundaplasty intervention which with the restore of a valid inflow in the profunda femoral artery can significantly reduce the ischemia of the limb.

Methods: Eighty-four interventions of profundaplasty were performed at the UO of Vascular Surgery of the SECONDA UNIVERSITA' DEGLI STUDI DI NAPOLI. The patients were: 57 males, 27 females, with mean age of 66.5 years; 31 were diabetics; five patients were at stage II B, 41 at stage III and 38 at stage IV A.

Results: In six months of follow-up the results were favourable in 67 patients; amputations were 14. Three patients died for cardiovascular arrest. In one year follow-up 51 cases were favorable with 12 amputations, and four patients died. In three years follow-up the results were favourable in 43 cases with six amputations and two patients died.

Conclusions: The femoro-popliteal bypass and/or distal bypass remains the leading therapeutic procedure in significant lower limb ischemia, but when conditions does not permit to perform such intervention, profundaplasty can represent, even on the basis of Our experience, an acceptable therapeutic support.

V4-4

CLINICAL OUTCOMES FOLLOWING ENDOVASCULAR TREATMENT FOR ISOLATED EXTERNAL ILIAC ARTEY OCCLUSIVE DISEASE

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Objectives: There are very few reported clinical outcomes following percutaneous transluminal angioplasty (PTA) for isolated external iliac occlusive (EIA) occlusive disease. This study aims to examine the role of PTA ± stenting for EIA occlusive disease.

Methods: Data prospectively collected on patients who had PTA±stenting for EIA occlusive disease were obtained from our dedicated vascular registry. From January 2003 to February 2007, 51 patients (40 male) with a mean age of 65.6 years (range 41-83 years) underwent EIA PTA±stenting. Indications for intervention were graded according to Fontaines classification; moderate claudication (2A) - n=5, severe claudication (2B) - n=34, rest pain (III) n=2 and critical limb ischaemia with tissue loss (IV) - n=10. Mean followed-up was 12.4 months (range 6-52 months).

Results: Thirty-four patients underwent PTA and 14 had PTA and stenting of the EIA. There were three failed attempts at stenting that underwent open revascularization. Forty-eight patients had successful PTA±stenting. During the study period primary patency was maintained in 20 patients (41.7%) and in another eight patients (16.7%) secondary patency was achieved. Of the 20 patients that re-occluded, 10 were graded as Fontaine IV (with non-healing ulcers) and associated superficial femoral artery disease. Of these, five had redo PTA±stenting and the other five had open revascularization. Of

the remaining 10 patients, five were managed conservatively and five went on to have surgery. The following complications were encountered; one EIA rupture requiring emergency surgery and two large groin haematomas that were managed conservatively. There was one death following infra-inguinal revascularisation surgery and another two patients underwent a major amputation.

Conclusions: PTA for EIA occlusive disease should be used selectively as short-term patency rates are poor, particularly for Fontaine IV patients.

V4-5

CRYOPRESERVED HOMOLOGOUS VEINS IN LIMBS SALVAGE - 12 YEARS OF EXPERIENCE

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Objectives: Improving the operability rate in patients with CLI and offer a different chance in graft infections.

Methods: From May 1995 and August 2007, in our operative unit of vascular surgery we have performed 194 revascularizations using criopreserved omologous veins in 175 patients (135 male, 40 female) 40% were diabetics. Twenty-six were reconstructions in graft infections. Eighty-three CLI, and 85 redo surgery in CLI.

Results: We reach the goal of limb salvage in graft infections in 79% of reconstructions. Eighty-six percent in CLI and 80% in redo surgery. After three years 72%, 61% and 53%, respectively.

Conclusions: Criopreserved veins can be a good alternative in limb salvage, best results are obtained with composite bypass in CLI, in the group of graft infections a 30% of reconstructions should be considered a bridge solution.

V4-6

ENDOVASCULAR MANAGEMENT OF TASC-2 C AND D LESIONS: EARLY AND MID-TERM RESULTS

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Objectives: To retrospectively analyse our experience with endovascular treatment of peripheral arterial disease, comparing early and mid-term results in patients with TASC-2 C and D lesions with those obtained in class A and B patients.

Methods: From May 2005 to December 2007, 198 endovascular procedures in patients with peripheral arterial disease were performed. Patients were divided on the basis of the characteristics of the lesions in TASC-2 A and B patients (Group 1, 101 cases) and TASC-2 C and D patients (group 2, 97 cases). Early (<30 days) results were assessed and were compared in the two groups with two and Fishers exact tests. Mid-term results were assessed with Kaplan-Meyer curves and the comparison between the two groups was performed with log-rank test. Multivariate analysis for the risk of late graft thrombosis was performed with Cox regression analysis.

Results: Technical success was obtained in 194 cases (98%); all technical failures occurred in group 2 (4.5%; $P=0.04$ with respect to group 1). There were no perioperative deaths and cumulative 30-day thrombosis and amputations rates were 1.5% and 0.5%, respectively, with no significant differences between the two groups. Mean duration of follow-up was 10 months (range 1-30, S.D. 7.2). Estimated primary and secondary patency rates at 12 months were significantly better in group 1 than in group 2 (89.5% and 63.3%, respectively; $P=0.001$, log rank 10.2; 95.5% and 79.5%, respectively, $P=0.009$, log rank 6.7). Univariate analysis demonstrated that also the presence of critical limb ischemia and the localization of the lesions at a femoro-popliteal level significantly increased the risk of thrombosis during follow-up ($P=0.05$, log rank 3.7 and $P<0.001$, log rank 14.8, respectively). Multivariate analysis confirmed a statistical influence on the risk of thrombosis during follow-up only for femoro-popliteal localization ($P=0.009$, 95% CI 0.05-0.6).

Conclusions: Endovascular treatment of patients with peripheral arterial disease and TASC-2 C and D lesions is feasible, providing acceptable early and mid-term results, even if significantly poorer than those obtained in A and B lesions, particularly in femoro-popliteal district.

V4-7

RARE FORMS OF PERIPHERAL ARTERIAL EMBOLISM

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Objectives: We present the experience of our Institute with rare forms of peripheral arterial embolism within the past 20 years in order to define the clinical presentation, method of diagnosis and results of treatment.

Methods: A review of all the patients with the discharge diagnosis of arterial embolism caused by some unusual causes, was conducted. Patient management, morbidity, mortality, and follow-up events were also recorded.

Results: Eleven patients - eight males and three females with average age of 49.5 years (range 25-73 years) underwent the urgent surgical treatment due to rare forms of peripheral arterial embolism. Three patients were operated due to a foreign body embolism; three due to emboli originated from malignant tissues; two due to a septic embolism; two due to an embolism from cardiac myxoma and one due to an embolism from myxomatous atrial septal defect. In all patients clinical presentation was acute ischemia of lower extremities. The preoperative evaluation included physical examination, laboratory findings and electrocardiography; in the majority of cases Doppler ultrasonography and angiography were performed. In all the patients (except those with a foreign body embolism), the intraoperative embolic material was pathohistologically and bacteriologically examined. Surgical treatment included foreign body extraction in three cases; thromboembolectomy in seven, and artery resection followed by saphenous graft interposition in one patient with septic embolism. In addition, three cardiosurgical procedures were performed: aortic valve replacement in the patient with a septic embolism and tumor excision in patients with atrial myxoma. Two patients with a malignant embolism were reoperated due to a recurrent arterial embolism within the same hospitalization. In addition, to the usual clinical signs of acute limb ischemia, in the rare forms of arterial embolism the presence of certain uncommon clinical symptoms were also observed. The early results of vascular surgical treatment were very good in all the patients. Further follow-up indicated poor prognosis in patients with malignant arterial embolism.

Conclusions: Our experience suggests the importance of being persistent in efforts to find the source of the embolism, because this is the only way for the proper treatment to be recognized and therefore, for the patient to recover completely as well as for the further further embolic complications to be prevented. A thorough pathohistological examination of embolic material in all patients with peripheral arterial embolism is strongly recommended. Recommendations for treatment depend on the certainty of diagnosis and should be individualized.

V4-8

MANAGEMENT OF UPPER EXTREMITY THROMBOEMBOLISM IN OCTOGENARIANS

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Objectives: Tromboembolic events may be highly morbid and mortal especially in elder age group of patients. The aim of this study is to discuss the most beneficial way of limb salvage treatment in octogenarians.

Methods: Twenty-six patients over eighty years old presented to our hospital with acute upper extremity thromboembolism during 2000-2007 were identified retrospectively. The time between symptoms and admittance to emergency room was noted. Demographic findings, the management either surgery or medical, and the prognosis was searched.

Results: The origin of embolus material was found to be cardiac in most of the cases (67%) and primary reason was identified as atrial fibrillation. More than half of the patients were female (57%). Other demographic findings are as follows: diabetic (60%), with a history of cardiac disease (83%), and had at least one tromboembolic event previously (34%). Fourteen of the patients underwent early surgical treatment and the symptoms revealed after surgery. Twelve of the patients were treated with medical approach, only. Four of these patients had admitted at very early hours after the beginning of symptoms and the treatment was successful. In the rest of the patients, medical treatment was unsatisfactory and the patients needed surgical embolectomy. In these patients the hospital stay and re admittance was found to be significantly higher than the early surgery group.

Conclusions: The overall mortality is similar for medical and surgical treatment of upper extremity thromboembolic events. Nevertheless, early surgery may lower the morbidity such as longer hospital stay and recurrence. We suggest early surgical embolectomy is superior than medical approach for octogenarians with upper extremity thromboembolic events.

V4-9

RESULTS OF DISTAL REVASCULARIZATION IN GENERAL POPULATION, DIALYSED, PATIENTS AFTER FAILED PTA

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Objectives: The aim of this study was to compare the results of primary OS for CLI in general population with the results in dialysed patients and in patients with previous failure of PTA, in order to determine the correct approach to every patient with CLI and the actual role of OS.

Methods: Between January 2004 and July 2007, 402 patients (266 male, 136 female) aged between 46 and 95 (average age 72) underwent OS or EV in response to CLI (39% foot finger or ante foot gangrene, 12% hind foot gangrene, 28% ulcers, 11% rest pain, 10% severe claudicatio). General comorbidities were: diabetes 66%, clinically apparent coronary artery disease 47%, previous CABG 8%, COPD 70%, chronic renal insufficiency 20%, ESRD 13%. We performed in these patients 239 EV (47%) and 267 OS (53%). Open revascularisations were femoro-tibial or plantar and popliteo-plantar bypasses with autologous material in 93% and PTFE in 7%. OS involved 29 (11%) dialysed patients (group 1), 98 patients with failure of previous EV treatment (37%), frequently performed in different and non-surgical centres (group 2), and 140 patients (52%) with CLI non-dialysed and not previously submitted to EV treatment (group 3, control group). We retrospectively compared the early results in these three groups of patients treated by OS in term of level of revascularisation, primary patency, amputation and mortality.

Results: Revascularizations have been directed to the tibial or to the plantar arteries at the ankle or foot. Those directed to the plantars were respectively, 83% in dialysed patients ($P < 0.005$); 76% in patients with previous failed PTA ($P < 0.001$); 54% in general population. Primary patency, amputation rate and mortality were respectively: 72.5% ($P < 0.001$) - 6.8% ($P < 0.5$) - 13.8% ($P < 0.005$) in dialysed patients; 74.5% ($P < 0.001$) - 5.1% ($P > 0.5$) - 4% ($P < 0.5$) in patients with previous failed PTA; 93.6% - 3.5% - 2.1% in general population.

Conclusions: In patients with ESRD, and in patients after failed EV therapy, the subsequent open surgery had to be more distal and technically demanding. Its results were significantly worse than in the general population, with an increase of redo. Our data suggested that EV should not be attempted as the first choice in every patient affected by CLI, and we believe that OS still is the primary treatment for the most advanced clinical situations, particularly in presence of ESRD and extensive loss of tissue, and of a very diseased arterial bed.

V4-10

ENDOVASCULAR TREATMENT OF TASC C AND D AORTO-ILIAC OCCLUSIVE DISEASE

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Objectives: For the last years it has been an increasing using of endovascular strategies for diffuse aorto-iliac occlusive disease. That is the reason why the TASC definitions have been modified. Study the results of the endovascular treatment in TASC C and D aorto-iliac occlusive disease defined by the TASC II classification.

Methods: Retrospective study including 40 patients from February 2003 to February 2008. Lesion classification is made according to the intraoperative angiography. Technical success, complications, ankle-brachial index (ABI), primary patency and limb salvage rates were analyzed. Statistic analysis was made with Kaplan-Meier survival time.

Results: The mean aged of the patients was 58.2 years (S.D. ± 10.1). Twenty-six patients presented TASC D lesions and 14 TASC C. Eight patients had critical leg ischemia. The technical success rate was 82.5% (33/40). In five cases recanalization were not possible. Another two patients presented an arterial thrombosis during the procedure and open surgery was necessary.

In another case an iliac arterial rupture was resolved with an endograft. All this complications were in TASC D lesions. The mean preoperative ABI was 0.45 (S.D.±0.22) and the postoperative was 0.89 (S.D.±0.15). The mean follow-up period from the successful procedures was 17.1 months. Primary patency rates were 93.3%, 89.6% and 79.3% at 6, 12 and 18 months. During

the follow-up period 2 TASC C patients and 3 TASC D presented occlusions. Limb salvage rate was 98.4%.

Conclusions: Endovascular treatment of TASC C aorto-iliac occlusive disease has better results. The successful procedures have acceptable primary patency rates.

**April 26th, 2008 3rd Congress Day
11:30-13:00
8th Cardiac Scientific Session - Aorta**

C8-1**THE MODIFIED BENTALL (BUTTON-BENTALL) TECHNIQUE: AN EXCELLENT OPERATION WITH EXCELLENT RESULTS**

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Objectives: We describe our experience with the modified Bentall (Button-Bentall) Technique over a five years period, showing how this technique is a simple, standard option, safe for the patient and with excellent results.

Methods: Between January 1999 and December 2006, 227 consecutive patients (191 males and 36 females) mean age of 63.13 years had aortic root replacement with a composite valved graft for dilatation or dissection of the aortic root. The aneurysmal disease was predominant (201 patients, 88.5%). Aortic dissection affected the remaining 26 patients (11.5%). The 'button modification' of the Bentall operation was performed in all patients, using different composite valved grafts. Eighty-four patients had a Sorin Carbonart graft; 58 patients received a St. Jude Medical prosthesis, while a Carbomedics model was used in 64 patients. An on-site tailored composite graft has been prepared in the remaining 21 cases, suturing the properly biological or mechanical valve prosthesis to an Hemashield or Gelweave Valsalva tubular graft.

Results: Thirty-day mortality rate was 3.5% (8 of 227 patients). Four of these patients had critical preoperative conditions (dissection or impending rupture of the aorta). Mean cardiopulmonary bypass time was 95.11 min and mean aortic cross-clamp time was 73.52 min. At eight years the actuarial survival rate is 88.1% and the freedom from reoperation is 100%.

Conclusions: The modified Bentall Technique is rapidly becoming a safe standardized operation, with excellent results in terms of mortality and complications.

C8-2**CAN THE CONVENTIONAL AORTIC ROOT REPLACEMENT BE IMPROVED?**

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Objectives: To improve hemodynamic characteristics of the mechanical conduit, we routinely use our own modification in which valve prosthesis is placed inside a Dacron tube leaving a margin of the Dacron below the valve for suturing to the aortic annulus. This composite graft allows the use of mechanical valve prosthesis larger than the annulus and a safe anastomosis with the aortic annulus or aortoventricular junction even in case of extended tissue destruction.

Methods: Between August 2000 and August 2006, a total of 262 patients (22 [9%] with acute aortic dissection and 46 [18%] with previous cardiac surgery) underwent aortic root replacement using this graft. In 35 patients with destroyed aortic annulus due to endocarditis or previous cardiac surgery the composite graft has been anastomosed to the altered or fragile tissue of aortoventricular junction or even to the sewing cuff of the mitral valve prosthesis. Cumulative follow-up time was 691 patient-years and was 100% complete. Mean follow-up was 2.64±1.91 years (range 0.1-6).

Results: The median size of aortic annulus in this patient group was 23 mm, for which a standard conduit with a valve prosthesis having a GOA of about 2.55 cm² and an estimated EOA of about 2.03 cm² would have been possible. However, the median GOA and EOA of the valve prostheses implanted (St. Jude Regent 25), was 4.02 and 3.34 cm², respectively. An expected prosthesis-patient mismatch could be avoided in 21 patients. No blood transfusion during the entire hospital stay was required for 150 patients (69%). There were 2 (0.8%) early and 11 (4.2%) late deaths. Nine of deceased patients had had previous cardiac surgery, which was identified as an independent predictor for mortality. Only five patients (1.9%) suffered valve-related events during the follow-up. The actuarial event-free survival at five years was 90% for all patients.

Conclusions: The modified, self-assembled mechanical valve composite graft with a supraannular position of the valve inside the tube provides improved hemodynamic and hemostatic characteristics leading to excellent early and mid-term results and therefore, has been established as a standard substitute for complete aortic root replacement in our clinic.

C8-3**SURGICAL TREATMENT OF TYPE 1 DISSECTING AORTIC ANEURYSMS: IS THE EXTENSION OF THE INTERVENTION ONTO THE ARCH JUSTIFIED?**

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Objectives: Description of our experience with and the particularities of surgical treatment of type 1 dissecting aortic aneurysm.

Methods: Over 900 radical operations on the ascending aorta (AA) and the aortic arch have been performed in Bakoulev Center. From 1990 to December 2007, surgical correction of type 1 dissecting aortic aneurysm was performed in 260 patients. Their mean age was 46±11.3 years, there were 207 men (78%), and 53 women (22%). The causes of the disease were: media necrosis in 51.4%, atherosclerosis in 23.1%, Marfan and Shereshevsky-Turner syndromes in 14.7% of patients. Bicuspid aortic valve was present in 20.5%, tricuspid in 79.5% of patients. The correction of dissecting aortic aneurysm consisted in ascending aorta replacement in accordance with Bentall-DeBono technique in 83.1%; supracoronary replacement with aortic root reconstruction in 16.9% of patients. In 27.7% of them aortic arch replacement was performed. The operations involving the aortic arch were carried out under deep hypothermia; brain protection was assured with antegrade brain perfusion with brachiocephalic trunk and left common carotid artery catheterization, or antegrade unilateral perfusion through the right subclavia artery, or retrograde brain perfusion.

Results: Total hospital mortality was 12.3% (32 patients). The deaths were caused by: acute heart failure, multi-organ failure, cerebral circulation disturbances. Mean duration of the follow-up was 8.3±4.4 years (6 months to 17 years). The outcomes of 56% of patients are known. In the long-term after surgery on the ascending aorta seven patients underwent aortic arch replacement, and ten interventions on the thoraco-abdominal aorta.

Conclusions: Indications for aortic arch replacement at surgical treatment of type 1 dissecting aortic aneurysms depends on a sharpness of disease, presence of the extension of dissection on brachiocephalic vessels and conditions of the thoraco-abdominal aorta.

C8-4**CORRECTION OF POSTSTENOTIC ANEURYSM OF ASCENDING AORTA**

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Objectives: To determine possibilities of correction of poststenotic aneurysm of ascending aorta (PAAA) by means of different methods.

Methods: During 1999-2007 years 112 patients (patients) with aortic stenoses (AS) and PAAA were operated in Institute. The average age was 57.2±6.3 (21-71) years. At all group 41 (36.6%) patients were in III NYHA class and 71 (63.4%) patients - in IV. The following operations were performed: aortic valve replacement (AVR)+wrapping of AA - 54 (63.5%) patients (group A), AVR+resection of AA+wrapping of AA 16 (18.8%) patients (group B), AVR+resection of AA+plasty of sinotubular junction (STJ) in zone of non-coronary cusp+wrapping of AA 12 (14.1%) patients (group C), AVR+plasty of STJ+wrapping of AA 3 (3.5%) patients (group D)). In all cases group A-D after AVR nylon tape (diameter 1 cm) was wrapping AA by 5-7 tours and fixation between them and in proximal and distal part of AA. Control group E is 39 patients with PAAA (diameter of AA >5.5 cm) was performed Benthal operation and Wheat operation in three patients. All operations were performed with CPB, moderate hypothermia (28-34 °C), retrograde St. Thomas cardioplegia.

Results: No hospital deaths among group A-D in hospital period and during remote period (average 4.2±0.9 years). Echo examination of diameter of AA for group A: preoperative 4.9±0.5 cm, postoperative (6-7 days) 4.0±0.4 cm, remote period 4.1±0.3 cm; for group B: preoperative 5.2±0.6 cm, postoperative - 3.8±0.3 cm, remote period 3.9±0.4 cm; for group C: preoperative 5.4±0.5 cm, postoperative - 3.7±0.4 cm, remote period 3.8±0.3 cm; for group D: preoperative 5.4±0.4 cm, postoperative 3.9±0.5 cm, remote period 4.0±0.2 cm. In group E: hospital mortality - 7.6% (n=3/39) for Benthal operation and 1 (2.9%) death at remote period (P<0.05). Cross-clamping time 74.4±9.2 min (group A-D) and 114.4±19.2 min (group E) (P<0.05). Blood loss 274.4±39.4 ml (group A-D) and 645.4±79.2 ml (group E) (P<0.05). Staying in ICU 54.4±6.4 h (group A-D) and 84.4±9.2 h (group E) (P<0.05).

Conclusions: On the basis of clinical experience we recommend the expedient method of complex reconstruction of PAAA during AVR without prostheses of AA.

C8-5 VALVE SPARING TECHNIQUES IN THE SURGERY OF ASCENDING AORTIC ANEURYSMS

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Objectives: Description of the results of ascending aorta replacement with the preservation of the aortic valve.

Methods: Aortic valve was preserved during surgical treatment of the ascending aortic (AA) aneurysms in 70 patients. Thirty-four patients underwent supracoronary AA replacement, 17 supracoronary replacement with aortic root reconstruction, five aortic root remodeling with aortic valve preservation in accordance with M. Yacoub technique, and in 14 patients aortic root and ascending aorta replacement with aortic valve reimplantation were performed (T. David technique). In 24 patients (34.3%) the intervention was extended onto the aortic arch. In 14 cases the operations were performed for urgent indications (acute aortic dissection). Mean age of the operated patients was 49.2 ± 14.8 years (5-77 years). Intraoperative criteria for valve preservation while using M. Yacoub or T. David technique were: absence of the free cusp(s) edge prolapse and good coaptation of the cusps with the commissures being put in the normal position. In the presence of anatomically normal cusps and unchanged aortic sinuses walls we performed supracoronary replacement of the ascending aorta; in cases of dissection extension onto the commissures apexes it was complemented by aortic root reconstruction.

Results: Hospital mortality was 7.1% (5 patients). Mean duration of the follow-up was 19 ± 21 months (6 months-8 years). In the long-term follow-up aortic regurgitation in all patients does not exceed the 1st degree, except for one female patient operated in the acute stage of the dissection (M. Yacoub technique); control EchoCG performed six months after the operation revealed aortic regurgitation up to the 3rd degree. She is under dynamic observation. Aortic root dilatation with aortic insufficiency up to 3rd degree was revealed in one patient eight years after supracoronary replacement of the ascending aorta with aortic root reconstruction. This patient underwent re-replacement of the ascending aorta and the aortic valve in accordance with Bentall technique.

Conclusions: The results of valve-preserving operations performed in aortic aneurysms suggest the possibility of successful restoration of aortic valve function. Long-term results are stable.

C8-6 COMPLEX REOPERATIONS ON THE THORACIC AORTA

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Objectives: Outstanding progress in the aortic surgery has allowed extending the surgical indications to extremely complex cases such as reoperations on the thoracic aorta. The aim of this study is to retrospectively evaluate the results in reoperations on the thoracic aorta using the antegrade selective cerebral perfusion (ASCP).

Methods: Between November 1996 and December 2006, seventy-seven patients (mean age 57.6 years) underwent complex reoperation on the thoracic aorta using ASCP. Previous surgery was defined as any previous cardiac or thoracic aorta repair. Reoperation was indicated for progression of chronic aneurysm of the distal aorta in 45 patients, post dissection aneurysm in 30 patients, type A acute dissection in 6, and for pseudoaneurysm and infection in one patient each. Reoperations were performed, on average, 8.9 years after the initial operation. The extension of aortic replacement included mainly the ascending aorta and aortic arch (37 patients, 48.1%). In seven patients the entire thoracic aorta was replaced. The most frequent associated surgical procedure was composite graft replacement in 35 patients (45.5%).

Results: The mean duration of cardiopulmonary bypass was 228.3 ± 70.9 min, aortic cross-clamping was 153.9 ± 53.7 min and ASCP time was 78.3 ± 49.9 min. In-hospital mortality was 16.9% ($n=13$). Multivariate analysis indicated cardiopulmonary bypass time as the only independent risk factor for hospital death ($P=0.007$, odds 1.01/min). Permanent neurologic dysfunction occurred in three patients (4.6%) and temporary neurologic dysfunction in seven patients (10.9%). Estimated survival at 1.5 and 10 years was 81.5, 74.8 and 63.2%.

Conclusions: Despite extreme underlying disease, complex reoperations on the thoracic aorta can be performed safely with satisfactory early and long-term results.

C8-7 REDUCTION AORTOPLASTY: EFFECTIVE, USELESS OR HARMFUL? RESULTS AT 10 YEARS

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Objectives: Reduction ascending aortoplasty is an alternative to ascending aorta replacement. This study was designed to evaluate the long-term survival and freedom from reoperation following aortoplasty. The postoperative stability of the aorta and preservation of its elastic property (Windkessel function) were investigated by CT.

Methods: From March 1993 to November 2003, 34 patients (mean age 65.7 years) with dilatation of the ascending aorta underwent reduction aortoplasty without external support in association with other cardiac procedures: aortic valve replacement in 31 patients, mitral valve surgery in 2, and CABG in 1. The ascending aorta diameter was measured before and at a median follow-up of 70.2 months in all patients. Postoperative Windkessel function was calculated by ECG-modulated CT-scans and compared with a group of five healthy individuals. Risk factors for survival and freedom from reoperation were determined by Cox regression.

Results: Perioperative mortality rate was 2.9%. The actuarial survival estimates at 1, 5 and 10 years were 94.1%, 88.1% and 78.3%, respectively. Only the ICU length of stay was a significant predictor of mortality. Ascending aorta redilatation requiring reoperation occurred in four patients (11.7%). Actuarial freedom from reoperation at 1, 5 and 10 years was 100, 96.7 and 78.2%, respectively. Maximal ascending aorta diameter was 48.9 ± 4.0 mm preoperatively and 44.6 ± 5.4 mm at follow-up. Preoperative diameter was not a significant predictor of redilatation. The mean diastolic-systolic augmentation (Windkessel function) assessed by CT was 1.1 ± 0.6 mm, significantly lower than in the control group (2.7 ± 0.2 , $t=4.643$, $P=0.0004$).

Conclusions: Recurrent dilatation of the ascending aorta does not require reoperation in the first five years after aortoplasty. Longer term follow-up is critical to assess its durability. On the basis of our study the procedure may be indicated for high risk patients with limited life expectancy.

C8-8 EARLY EXPERIENCE WITH A NOVEL PREFABRICATED STENTLESS VALVED-CONDUIT

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Objectives: To evaluate the surgical experience and the early clinical outcome of a novel prefabricated stentless valved-conduit (BioValsalva) that does not require anticoagulation and exploits the excellent hemodynamic performance of stentless valves and the presence of sinuses of Valsalva.

Methods: Between December 2006 and December 2007, 17 patients of age 65 ± 10 years underwent aortic valve, root and ascending aorta replacement with the BioValsalva valved-conduit. The prosthesis incorporates a stentless porcine aortic valve (Elan, Vascutek) suspended within a triple-layered vascular conduit (Triplex, Vascutek) constructed with sinuses of Valsalva. The Triplex vascular graft structure consists of an inner woven polyester layer, a middle elastomeric membrane to mimic elasticity of the aortic wall and an outer polytetrafluoroethylene layer. All patients had ascending aorta aneurysms with a mean diameter >50 mm, 15 patients had annuloaortic ectasia and pure aortic regurgitation resulting from degenerative valve disease unsuitable for repair, two patients had severe aortic stenosis. Logistic EuroSCORE was $15.8 \pm 7.6\%$ (range 6.4-34.4%). Two sizes of the BioValsalva were used: 26 mm and 28 mm conduits with 25 mm and 27 mm valves, respectively. The sewing ring of the BioValsalva conduit was anastomosed to the aortic annulus using a variety of techniques depending on the aortic anatomy. Six patients with large aneurysm of the ascending aorta required deep hypothermic circulatory arrest.

Results: There was no perioperative mortality. There were no myocardial infarctions, cardiac failure or cerebrovascular events. The mean cardiopulmonary bypass and ischemic times were 162 ± 55 and 107 ± 29 min, respectively. The mediastinal drainage was 422 ± 169 ml, and mean transfusion requirement for packed red cells, platelets and fresh frozen plasma were

1.6, 1.0 and 1.1 units per patient, respectively. Three patients did not require any blood product transfusion. One patient was reopened for bleeding from the Dacron conduit replacement of the distal ascending aorta. Postoperative CT-scans of the aorta and transthoracic echocardiography in all patients demonstrated well-functioning prosthetic aortic valves without regurgitation, with small residual peak gradients (17.4 ± 6.8 mmHg), and presence of sinuses of Valsalva.

Conclusions: The BioValsalva composite stentless-valved-conduit possesses excellent hemodynamic performance, and is safe to implant with associated low morbidity. In addition, the conduit material is hemostatic and reduces bleeding, and also facilitates implantation lending itself well to a variety of insertion techniques. Use of this composite valved-conduit, with incorporation of sinuses of Valsalva into the neo-aortic root may improve the function and durability of the stentless valve.

C8-9

COMPARISON OF REAL AND SIMULATED AORTIC INTERLEAFLETS TRIANGLES ANNULOPLASTY

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Objectives: The Aortic Interleaflets Triangles Annuloplasty (AITA), first described by Cabrol in 1969, was a simple technique to achieve an Aortic Root Functional Unit (F.U.) stabilization, improving leaflet coaptation and functional reserve after Aortic Valve leaflet repair. In collaboration with the Politecnico of Milan Bioengineering Department we developed three finite-elements computational models of the F.U.: a normal root, a root with a dilated annulus and a AITA repaired root in order to compare these models with our clinical practice and to identify the best interleaflets triangles height where to perform the plasty.

Methods: From September 2003 to February 2008, 105 patients (pts) were treated with an association of aortic leaflet repairing techniques. In 95 patients (90.5%) a AITA was performed. All patients were submitted to: pre and post-operative echocardiography. The AITA simulation on a finite elements dilated annulus root model was able to identify the 48% of the interleaflet triangles height (ITH) as the best place to perform the procedure in order to maximize the coaptation area, to minimize the regurgitant orifice and the transvalvular gradient. Using the regression relationship equation of the model applied to our post-operative virtual basal ring echo data, we were able to calculate the Estimated Height (EH) of our AITA.

Results: Postoperatively the diameters of the Functional Unit decreased as follow: annulus from 23.4 ± 3.93 to 20.1 ± 1.8 mm ($P < 0.05$), sinuses from 41.53 ± 6.347 to 38.2 ± 4.0 mm ($P < 0.01$) and STJ from 41.3 ± 6.47 to 35.25 ± 5.95 mm ($P = ns$). The mean ITH was 11.18 ± 1.74 mm and the mean EH obtained from the equation $EH = (34.427 - \text{post-op annulus diameter}) / 2.6833$ was 5.34 ± 0.6 that is the 47.76% of the ITH comparable to the 48% of the computational model. The leaflet coaptation length after AITA increased from 2.73 ± 1.25 to 7.56 ± 2.36 mm ($P < 0.001$) and in the model the leaflet coaptation area from 8% to 48%.

Conclusions: So far, the AITA seems to be a valuable technique to increase leaflet coaptation length in aortic valve repair and in silico models seem to be able to predict the principles of the phenomena but not the individual complexity.

April 26th, 2008 3rd Congress Day

11:30-13:00

9th Cardiac Scientific Session - Coronary

C9-1

P-CIRCUIT TECHNIQUE FOR CORONARY REVASCULARIZATION: FIVE-YEAR EXPERIENCE

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Objectives: To evaluate the feasibility/effectiveness of the P-circuit technique as method of choice for patients requiring coronary revascularization.

Methods: From 2/2001 to 11/2005 1359 patients underwent coronary revascularization with the use of P-circuit consisting, of: (1) beating heart, (2) OPCAB, (3) aorta no-touch, (4) use of composite grafts, and (5) total arterial revascularization. The hi-risk subgroups were studied for pre-op, intraoperative and postoperative variables with Fisher's exact, χ^2 -test, Kaplan-Meier method and Cox regression analysis.

Results: There were three ICU deaths in the first seven days after surgery. Hospital mortality was 1.5% (21 patients). There were various early postoperative complications as renal failure, pulmonary complications, prolonged mechanical ventilation, superficial sternal wound infection, atrial fibrillation, reexploration, postoperative IABP psychological complications and Gastrointestinal complications. The incidence of these complications varied from very low incidence as in psychological complications (0.6%) and reexploration and sternal wound infection (0.7%, 1%, respectively) to a high incidence as for atrial fibrillation (20%) passing through a medium risk of other complications. The incidence of overall events during the mid-term follow-up period (from 4 to 60 months) as recatheterization, reintervention and mid-term mortality were 2.4, 0.6 and 4.8, respectively.

Conclusions: The P-circuit technique can be the method of choice for all high risk patient sub-groups requiring surgical revascularization and is accomplished with low morbidity and mortality rates.

C9-2

OFF-PUMP CORONARY REVASCULARIZATION LOWERS MORTALITY, MORBIDITY AND COST IN HIGH RISK PATIENTS. PROSPECTIVE CLINICAL TRIAL

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Objectives: We report our comparative experience of On-pump and Off-pump coronary artery revascularization using the EuroSCORE to calculate the risk of preoperative mortality.

Methods: A single center clinical study was conducted prospectively between October 2005 and October 2007. It compared the short (30 days), six months, and one year clinical outcomes of on- and-off pump coronary revascularization in high risk patients (>5) according to the EuroSCORE system.

Results: One hundred and forty-seven consecutive patients were divided into 70 on-pump and 76 off-pump procedures based on the intention to treat. Mean predictive logistic EuroSCORE was $8 \pm 4\%$ for the on-pump group and $13.4 \pm 13\%$ for the off-pump group ($P < 0.0001$). Mean number of distal anastomoses were similar. Postoperative mortality was 7.1% and 5.2%, respectively ($P = NS$). The off-pump group exhibited less atrial fibrillation, blood products transfusion and pulmonary complications as a shorter ICU stay and lower cost. No major adverse event was reported during the follow-up that averaged 24.5 ± 13.8 months. Angina recurrence was one patient in each group.

Conclusions: In an era when the limitations of prospective randomized trials have been recognized and rather than trying to smooth the large differences between groups by making a propensity analysis of our results, we assume that the demonstration that OPCAB provides the same mortality and a lower morbidity and cost to high risk patients when compared to high risk patients in the same hands with the same revascularization pattern is one more major indication to recommend OPCAB in high risk. This advocates for a widespread usage of this technique in high risk patients.

C9-3

RESULTS OF OFF-PUMP CABG SURGERY USING BILATERAL INTERNAL THORACIC ARTERY GRAFTS IN OCTOGENARIAN PATIENTS DURING TEN YEARS

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Objectives: The aim of this study is to review and present our experience in performing off-pump CABG surgery using bilateral internal thoracic artery grafts in octogenarian patients. We analysed the early outcome of surgery in this group of patients in terms of morbidity and mortality in order to find out whether this type of surgery in such a high-risk group had a higher incidence of perioperative complications or not.

Methods: In the period between April 1998 and December 2007, sixty four octogenarian patients were submitted to off-pump CABG surgery using bilat-

eral internal thoracic artery grafts. A retrospective study was conducted in which data was gathered from an electronic data base storing system. Demographic data and other risk factors were identified. Risk was calculated by applying both additive EuroSCORE and Parsonet 95 scales for all patients. Details of the surgical intervention and postoperative period were registered as well.

Results: The mean age was 81.8±1.8 years. Male to female ratio was about 4 to 1. The main associated cardiovascular risk factors were: arterial hypertension (64.1%), smoking (34.4%) and diabetes mellitus (31.2%). Other risk factors were: peripheral vascular disease (17.2%), chronic renal failure (9.4%), previous cerebrovascular accidents (6.2%) and finally previous cardiac surgical interventions (3.1%). The mean scores of both EuroSCORE and Parsonet 95 were 7.1±1.9 and 6.1±2.3, respectively. Moreover, significant main left coronary trunk lesions were found in 51.6% of patients. The mean left ventricular ejection fraction was 57.3±12.3. Unstable angina was the main presenting symptom in 70.3% of patients and 12 patients (18.7%) had a recent acute myocardial infarction. Urgent surgery was performed in 15.6% of patients. The mean number of grafts was 2.6±0.6 vessels with a mean total coronary artery occlusion time of 27.9±9.6 min. The global morbidity rate was 60.9%. The main postoperative complications were: respiratory (25%), atrial fibrillation (17.2%), deterioration of renal function (15.6%) and neurological (14.1%). Sternal wound infection occurred in only 4.7% of patients. The mortality rate was 6.2%. The mean of stay in intensive care unit was 2.4±1.9 days while the mean of total hospital stay was 7.6±/3.7 days.

Conclusions: Off-pump CABG using bilateral internal thoracic artery grafts had a high rate of postoperative morbidity while mortality rate was fairly low. Adequate preoperative optimisation and perioperative care of the octogenarian patient who will be submitted to coronary surgery are of paramount importance in order to reduce the perioperative morbidity and mortality rates.

C9-4

CLINICAL APPLICATION OF AUTOLOGOUS BONE MARROW MONONUCLEAR CELLS IN PATIENTS WITH NON-ACUTE CORONARY ARTERY DISEASE (3-YEAR FOLLOW-UP)

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Objectives: Little is known about efficiency of intracoronary delivery of autologous bone marrow mononuclear cells (ABMMC) in patients with non-acute ischemic heart disease.

Methods: Autologous transplantation of ABMMC was performed in 105 patients with non-acute ischemic heart disease. Intramyocardial delivery was used as adjunctive therapy to coronary artery bypass grafting, as well as intracoronary infusion during coronary angioplasty in 10 and 2 patients, respectively. For 88 patients with counterindications to open heart and/or endovascular surgery, the ABMMC suspension was injected intracoronarily during coronary angiography, with 0.4-0.6×10 billion nucleated cells, including 0.1-0.16×10 billion mononuclear and 0.5-1.8×10 million CD34+cells, being introduced for each patient.

Results: The patients were followed for 36 months. We observed clinical improvement in 82 patients. Five patients died. A significant reduction in the number of angina episodes and nitroglycerin consumption was noted in 70% patients after one year passed. Single-photon emission computer tomography revealed a significant improvement in the initially non- and/or hypoperfusable myocardium area(s). Positron emission tomography demonstrated an appreciable improvement in both myocardial viability and perfusion. Echocardiography revealed some decrease in end-diastolic and end-systolic volume of left ventricle as well as an increase of global ejection fraction in patients with initially dilated left ventricle.

Conclusions: Autologous bone marrow cell therapy can be considered to be a distinct strategy for chronic human ischemic heart disease as an efficient and safe approach to the restoration of the myocardium perfusion and myocardial viability.

C9-5

TRANSIT TIME FLOW MEASUREMENT: WHAT ROLE IN ON-PUMP VS. OFF-PUMP CORONARY SURGERY

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Objectives: The purpose of this study is to evaluate and to compare the intra-operative surgical results of on-pump and off-pump coronary surgery in the domain of graft dysfunction using the transit time flow measurement (TTFM). **Methods:** Two hundred patients undergoing isolated CABG via median sternotomy performed by the same surgical team in the same centre were included in the study. One hundred were done on-pump and one hundred were done on beating heart representing group (A) and group (B) respectively. TTFM was routinely performed for assessment of graft patency during each operation. Preoperative, intraoperative, and postoperative variables were collected and expressed as means±S.D. Comparison of the two groups was performed using the independent two-sample t-test, the independent two-ratio test (Z-test), and the independent Fisher's χ^2 -test. A $P<0.05$ was considered as statistically significant. Interpretation of the values obtained using TTFM has allowed us to reach a decision whether to revise a graft or not.

Results: The clinical features of the two groups were comparable. We assessed patency of 462 grafts in 200 patients using TTFM. Revision was required for 18 grafts in 18 patients based on unsatisfactory TTFM finding, four of which were from group (A), and the remaining fourteen from group (B). Incidence of overall mortality ($P<0.05$), peri and postoperative myocardial infarction ($P<0.05$), and IABP insertion ($P<0.05$) were significantly lower in group (A) than group (B).

Conclusions: We believe That TTFM seems to be a crucial tool in the assessment of graft function and that it allows to decrease graft failure during the operation. Our results suggest that detection of graft dysfunction using intraoperative TTFM improves the surgical outcome irrespective of the technique used in CABG as it is a matter of indications.

C9-6

TOTAL ARTERIAL REVASULARIZATION WITH BILATERAL INTERNAL THORACIC ARTERIES: EXPERIENCE AND RESULTS IN 913 CONSECUTIVE PATIENTS

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Objectives: Nowadays is worldwide accepted the benefit of arterial revascularization in term of survival and grafts patency in the treatment of ischemic heart disease. A lot of different techniques to achieve a complete revascularization have been reported. We analyzed the results of arterial revascularization using the bilateral internal mammary arteries in the treatment of multivessel coronary disease.

Methods: Between January 2001 to December 2007, 913 consecutive patients underwent to coronary artery by-pass (CABG) with double mammary grafting. Two configuration were used: the Y-graft construction and in situ technique. The patients were studied retrospectively by collecting data from hospital records and followed for 0-7 years.

Results: The mean age was 62±2.2 years, 698 were male. The in-hospital mortality was 0.6%, no difference was reported between the Y-graft or the in situ technique. The incidence of perioperative infarction was 0.3% and reoperation for bleeding was required in the 8% of the population, deep sternal infection rate was 0.5%. Actuarial survival rate at three years was 98.3%, the freedom from reoperation was 98% and the freedom from re-catheterization was 96%.

Conclusions: As previously described in literature the use of two arterial conduits provide increasing survival benefit for coronary disease and reduce the risk of reintervention even in older people. In our experience the use of bilateral mammary arteries provide a simple technique that allow us to obtain in the majority of the patients a complete revascularization with very low perioperative risk and good results during the follow-up time.

C9-7

OFF-PUMP CORONARY ARTERY BYPASS SURGERY (OPCAB) IN 2156 CONSECUTIVE PATIENTS: EARLY AND MID-TERM RESULTS

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Objectives: Off-pump coronary artery bypass surgery (OPCAB) is currently used as an alternative to conventional on-pump surgery (CAB), but there are still very little data available on its systematic use. The aim of this study is to evaluate early and mid-term results on 2156 consecutive patients.

Methods: From March 2003 to December 2007, 2156 patients (male/female 1745/411; mean age 64.5±9.9) underwent coronary artery surgery. Indication for OPCAB was systematic in all the patients and only 5.4% were converted to CPB without receiving cross-clamp and cardioplegic arrest. Acute coronary syndrome and congestive heart failure were not considered absolute contraindications to OPCAB. All procedures were performed by three staff-surgeons. Disposable devices for coronary stabilisation and intra-coronary shunts were used. The data, prospectively collected, were retrospectively analyzed.

Results: The number of graft-per-patient was 2.6±0.8 (min 1, max 6). Left internal thoracic artery (ITA) was used in 98% of patients. Sixty-six percent of patients received more than one arterial graft (bilateral ITA, and left radial artery). Mean postoperative extubation time was 8.4±6.6 h, mean 24-h bleeding was 450 ±230 ml, and mean length of postoperative hospital stay was 5.2±4.5 days. Operative 30-day mortality was 0.8% in elective and 2.1% in emergency surgery. There was no difference on mortality in the group converted to on pump surgery. Follow-up time was 95.4% complete. The actuarial survival and freedom from new revascularisation at 12, 36, 55 months was 96.9, 95.2, 88.7 and 97.6, 96.4, 92.8, respectively. Age, congestive heart failure, peripheral vascular disease, BPCO and obesity were risk factors for mid-term mortality. Survival free of any cardiac events (cardiac death, myocardial infarction, unstable angina, heart failure or reintervention) was 86±2.8%. Conversion to on pump was not predictor of mid-term mortality or the need for repeat revascularisation.

Conclusions: Systematic OPCAB is possible and safe, with good early and mid-term results, respecting the criteria of complete revascularisation, the use of arterial conduits and also feasibility and reliability in routine use.

C9-8

EFFECT OF TRAINING ON LONG-TERM OUTCOME IN CORONARY ARTERY BYPASS GRAFTING

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Objectives: There is a growing difficulty to balance the quality of the services provided with the need for surgical training. Aim of the study was to assess the effect of training on outcome in coronary artery bypass grafting (CABG).

Methods: Between January 2000 and December 2003, 1862 consecutive patients underwent isolated CABG. One thousand three hundred and sixty-four (73.3%) were operated by consultant surgeons (group A) and 498 (26.7%) by trainee (group B). Comparison of clinical characteristics, in hospital mortality and morbidity as well as mid-term mortality was made between both groups. All data were prospectively entered into a database. Mean follow-up was 2120.2 days (S.D. 422.9).

Results: Patients operated by consultants surgeons had higher Parsonnet score 7.3 (S.D. 6.1) vs. 6.8 (S.D. 5.5) ($P=0.044$), additive EuroSCORE 4.0 (S.D. 3.2) vs. 3.7 (S.D. 2.8) ($P=0.026$) and logistic EuroSCORE 5.2 (S.D. 8.1) vs. 4.1 (6.6) ($P=0.005$). However, their patients were younger 63.6 (S.D. 9.2) vs. 64.5 (S.D. 8.9) ($P=0.029$) and more likely to be male 1132 (83%) vs. 396 (79.5%) ($P=0.042$). Trainee surgeons were less likely to operate on patients with previous cardiac surgery 61 (4.5%) vs. 13 (2.6%) ($P=0.034$), poor EF 115 (8.4%) vs. 29 (5.4%) ($P=0.03$) or with preoperative IABP 78 (5.7%) vs. 7 (1.4%) ($P<0.001$). Patients in group A had more grafts per patient 3.3 (S.D. 0.9) vs. 3.0 (S.D. 0.7) ($P<0.001$), shorter bypass time 89.1 (S.D. 34.9) vs. 95.6 (S.D. 27.7) ($P<0.001$) and longer ITU stay 2.3 days (S.D. 3.1) vs. 1.7 (S.D. 0.9) ($P=0.002$). There were no other differences in postoperative period. In hospital 36 (2.6%) vs. 9 (1.8%) ($P=0.15$) and mid-term mortality 89 (6.5%) vs. 29 (5.9%) ($P=0.29$) were also comparable.

Conclusions: Training does not adversely affect the early and mid-term outcomes of CABG.

C9-9

OFF-PUMP CORONARY BYPASS SURGERY IS SAFE AND EFFECTIVE FOR PATIENTS WITH MAIN LEFT DISEASE

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Objectives: The main goal of this study was to assess safety and efficacy of surgical revascularization in patients with left main disease performed on a

beating heart (OPCAB). Furthermore, early results of such procedure were analyzed and compared with outcomes of the regular, on-pump CABG.

Methods: Between January 1, 2004 and August 31, 2005 among 1726 patients operated on coronary artery disease, 382 patients had left main disease (50%). Patients were non-randomly assigned to receive surgical revascularization performed of a beating heart (OPCAB, $n=117$) and facilitating extracorporeal circulation (CABG $n=265$).

Results: Beating heart technique was used more extensively in high risk patients (EuroSCORE: OPCAB vs. CABG: 4.73±3.01 vs. 3.8±2.87, respectively; $P=0.004$) with history of stroke or/and cerebrovascular disease (OPCAB 17.9% vs. 9.1% CABG $P<0.05$) including stroke (OPCAB 7.7% vs. 3.0% CABG $P<0.05$). However, patients operated on pump received higher number of grafts per patient (OPCAB 2.35±0.72 vs. 3.06±0.85 CABG $P=0.001$) due to more extensive nature of coronary disease (3 vessel disease OPCAB 19.7% vs. 33.2% CABG $P<0.05$). There were no statistical differences in number of perioperative myocardial infarction (CABG 3.0% vs. OPCAB 5.1%; NS), postoperative stroke (CABG 1.5% vs. OPCAB 2.6%; NS) or death (CABG 3.4% vs. OPCAB; 3.4% NS).

Conclusions: Comparison of early results of conventional and off-pump coronary artery bypass grafting in patients with left main stenosis showed a selection of high risk patients with prior stroke and/or cerebrovascular disease being grafted without CPB may account for the low incidence of neurological complications, post and perioperative myocardial infarct or death in both groups. Coronary artery bypass grafting using off-pump technique is safe, feasible and effective in patients with critical left main stenosis.

C9-10

PERIVASCULAR TISSUE OF INTERNAL THORACIC ARTERY RELEASES VESSEL-SPECIFIC ANTICONTRACTILE FACTOR

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Objectives: It was recently shown that perivascular tissue (PVT) of human internal thoracic artery (ITA) releases potent, soluble anticontractile factor. The nature of this factor and its influence on other vascular beds used in coronary surgery remains unknown. The aim of the study was to assess anticontractile properties of perivascular tissue of human ITA and its effect on contractility of saphenous vein (SV) and radial artery (RA).

Methods: Human ITA, SV and RA rings were studied in-vitro. Concentration response curves to serotonin (10⁻⁹-10⁻⁴M) were constructed. Maximal response (E_{max}) and $pD2=-\log EC50$ were calculated from regression analysis. In every experiment two preparations of studied vessel devoid of perivascular tissue were analyzed in two separate tissue baths. Reactivity of ITA was compared first ($n=10$). In bioassay experiments fragment of ITA from one patient was skeletonized and divided into two preparations. The first one was incubated alone, the other together with PVT remaining from skeletonization that was floating freely in the bath. Both fragments were simultaneously contracted with serotonin. PVT was then transferred from one to the other bath and concentration-response curves were reconstructed. Next, the same protocol was applied for SV ($n=12$) and RA ($n=8$) using PVT remaining from ITA skeletonization from the same patient. One averaged concentration-response regression curve was obtained for every type of vessels studied with PVT in the bath and one when PVT was not present. Parameters of regression analysis were compared using Student's *t*-test.

Results: Perivascular tissue significantly attenuated ITA contractile response to serotonin (E_{max} 41±5 vs. 20±3 mN, PVT(-) vs. PVT(+), respectively; $P<0.001$). PVT presence in the bath did not change ITA sensitivity ($EC50$) to serotonin; $pD2$: 6.2±0.3 vs. 5.8±0.3, respectively, $P=0.3$. Factor released by ITA's PVT failed to change saphenous vein and radial artery contractility to serotonin. Saphenous vein: E_{max} 91±6 vs. 100±6 mN; $P=0.33$. Radial artery: E_{max} 123±11 vs. 128±13 mN, PVT(+)-vs. PVT(-), respectively; $P=0.73$. Saphenous vein and radial artery sensitivity to serotonin both with and without perivascular tissue were not changed (saphenous vein: $pD2$: 7.1±0.2 vs. 6.8±0.2, $P=0.2$; radial artery: 6.8±0.2 vs. 6.5±0.3, $P=0.5$, tissue vs. no tissue present, respectively).

Conclusions: Perivascular tissue of ITA releases soluble factor that significantly attenuates ITA contractility and might therefore prevent ITA spasm. This factor does not affect contractility of saphenous vein and radial artery. This may suggest that factor released by PVT is a vessel-specific agent.

April 26th, 2008 3rd Congress Day
11:30-13:00
10th Cardiac Scientific Session - Cardiac General

C10-1**REINTUBATION AFTER CARDIAC SURGERY**

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Objectives: After cardiac surgery procedures, weaning from mechanical ventilation and endotracheal extubation usually proceeds uncomplicatedly. Failure of the patient to tolerate extubation may reflect premature extubation or may be a marker of a sicker patient. In this study we evaluate the determinants, characteristics, and outcomes of the patients who were reintubated in the early postoperative period following cardiac surgery.

Methods: The study population consisted of 320 patients (aged 66.1±0.95 year-old), undergoing cardiac surgery with cardiopulmonary bypass. We enrolled the patients who needed reintubation during their stay in the ICU and tried to correlate patient characteristics, operation characteristics, and biochemical markers with the possibility of reintubation.

Results: Twenty-nine patients (9%) needed reintubation during their stay in the ICU. The possibility of reintubation was positively correlated with age ($\rho=0.229$, $P=0.007$), obstructive pulmonary disease ($\rho=0.409$, $P=0.001$), cardiopulmonary bypass time ($\rho=0.183$, $P=0.032$), renal failure ($\rho=0.322$, $P=0.0001$), white blood cell count ($\rho=0.291$, $P=0.001$), fever ($\rho=0.381$, $P=0.0001$) and atrial fibrillation (0.323, $P=0.0001$). Patients who were reintubated had much higher mortality compared with the control group ($\rho=0.556$, $P=0.0001$).

Conclusions: Older patients with pulmonary disease are more vulnerable to reintubation especially after operations that need prolonged by pass time. Postoperative complications especially infections and renal failure also contribute to this situation.

C10-2**PRECONDITIONING PROPERTIES OF SEVOFLURANE IN PATIENTS UNDERGOING CORONARY SURGERY WITH CARDIOPULMONARY BYPASS**

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Objectives: The aim this study was to assess preconditioning properties of Sevoflurane in patients undergoing coronary surgery with normothermic cardiopulmonary bypass and to compare with propofol - fentanyl technique.

Methods: Elective coronary surgery patients were randomly assigned to two different anesthetic protocols ($n=50$ each). In sevoflurane group anesthesia was induced with Sevoflurane® 1.7-2.1 MAC, Pipecuronium 0.03 mg kg⁻¹; maintenance of anesthesia was 1.5-2.1 MAC Sevoflurane®; maintenance of anesthesia during CPB (2.5 l/min/m² Terumo® Advanced Perfusion System 1) was 1.0-1.3 MAC Sevoflurane®. Volatile anesthetic was delivered into oxygenator in composition of gas mixture. In control group anesthesia during surgery maintained by a continuous infusion of Fentanyl 5 µg kg⁻¹ h⁻¹ and Propofol 2 mg kg⁻¹ h⁻¹, Pipecuronium 0.03 mg kg⁻¹. We used antegrade cardioplegia Custodiol® 20 ml/kg. Postoperative analgesia was achieved by Fentanyl (PCA). We assessed the time respiratory support, length of stay in the ICU, necessity and duration inotrope therapy, determined the intraoperative BIS, hemodynamic profile, oxygen delivery and consumption, IL1, IL2, IL4, IL6, IL8, TNF, Oxystat, patient S100, NS Enolase, Troponin I, CKMB, Glucose, Lactate, Cortisol. These samples were obtained before surgery (baseline), after administration heparin (Th), after administration protamin (Tp), at arrival in the intensive care unit (T0), after 2 h (T2), and 24 h (T24).

Results: Stroke volume and LVSWI were remained unchanged in the Sevoflurane group but were decreased transiently after cardiopulmonary bypass in the propofol group. Duration of stay in the intensive care unit was lower in the Sevoflurane group than in the propofol group 6.3±1.6 h vs. 18.2±1.5 h ($P<0.05$); time respiratory support 18±6 min vs. 212±44 min ($P<0.05$). Intraoperative and postoperative troponin I levels and CKMB concentrations in the Sevoflurane group were lower than in the propofol group ($P<0.01$). IL1 ($P<0.01$), IL2 ($P<0.05$), IL4 ($P<0.05$), IL6 ($P>0.05$), IL8 ($P<0.05$), TNF ($P<0.05$), and Oxystat ($P<0.05$) concentrations were lower in the Sevoflurane group than in control group. Cortisol levels in the Sevoflurane group were significantly lower than in the propofol group ($P<0.01$).

Conclusions: Our results indicated that use of Sevoflurane technique in patients undergoing coronary artery surgery with CPB, has more clinically significant cardioprotective effects than propofol technique.

C10-3**COMBINATION SEDOANALGESIA WITH REMIFENTANIL AND PROPOFOL VS. REMIFENTANIL AND MIDAZOLAM FOR ELECTIVE CARDIOVERSION AFTER CORONARY ARTERY BYPASS GRAFTING**

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Objectives: Postoperative atrial fibrillation (AF) occurs in up to 50% of cardiac surgery patients and represents the most common postoperative arrhythmic complication. Elective cardioversion, a short but painful procedure, remains an option for patients who do not convert to sinus rhythm with medical therapy. Combinations of remifentanyl (a potent analgesic with a short elimination time) with propofol (a hypnotic agent) or midazolam (a sedative agent) produce a synergistic interaction. This study was undertaken to compare these combinations in terms of effectiveness and pain relief when given as sedoanalgesia for elective cardioversion.

Methods: In this prospective, randomized trial, 60 adult patients with postoperative AF after coronary artery bypass grafting were given a single dose of propofol 1 mg/kg combined with remifentanyl 0.1 µg/kg (group 1), or midazolam 0.05 mg/kg combined with remifentanyl 0.1 µg/kg (group 2). Cardiorespiratory parameters were monitored and recorded.

Results: Demographic data were similar ($P>0.05$) and sufficient sedoanalgesia and successful cardioversion were achieved in both groups. Hemodynamic parameters revealed no significant differences between groups ($P>0.05$); however, induction time, time to eye opening, recuperation time, and time to full recovery of psychomotor function were faster in group 1 than in group 2 ($P<0.05$).

Conclusions: The remifentanyl/propofol combination provided sufficient analgesia, satisfactory hemodynamic stability, and mild respiratory depression, along with faster recovery and discharge times from the intensive care unit.

C10-4**PREDICTION OF RENAL REPLACEMENT THERAPY AFTER CARDIAC SURGERY**

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Objectives: Acute kidney impairment (AKI) requiring renal replacement therapy (RRT) is an infrequent but dangerous complication of cardiac surgery. Its development is associated with high mortality and morbidity. A recently published simple risk stratification algorithm has been developed and validated in USA and Canada, but its discriminatory power has never been tested in Europe. We wanted to cross-validate the newly developed risk stratification algorithm in a group of patients operated on in a single cardiac centre in Poland.

Methods: From the hospital database we selected 1421 patients fulfilling identical inclusion and exclusion criteria as in the Canadian derivation cohort. In each patient eligible for analysis we calculated simplified renal index (SRI) and assessed its predictive power for RRT.

Results: After surgery 33 (2.3%) patients developed AKI and subsequently underwent RRT. The SRI precisely predicted risk of postoperative RRT in our group. Patients with low (0-1), medium (2-3) and high values of SRI (4 and more) were found to have increasingly higher risk for RRT (1.1%, 3.2% and 12.5%, respectively). The area under the ROC curve for the SRI as the predictor for RRT was 0.73 (95% CI, 0.62-0.81) and did not differ significantly from the values obtained in the original paper.

Conclusions: The new Canadian risk stratification algorithm is very effective in the discrimination of patients at high risk for development of AKI with the need of renal replacement therapy in the East European population.

C10-5**PREOPERATIVE ANEMIA AS A RISK FACTOR ON OUTCOME IN PATIENTS UNDERGOING CARDIAC SURGERY**

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Objectives: Preoperative anemia as an important risk factor for morbidity and mortality after cardiac surgery has not been well documented. It is well known that it has a significant role in perioperative transfusions, which are definitely associated with adverse outcomes. Our aim is to assess if preoperative anemia could be significantly associated with adverse effects after cardiac surgery with cardiopulmonary bypass (CPB).

Methods: In our study we enrolled 219 patients who underwent cardiac surgery with CPB between January 2006 and December 2006. We collected data about patients' history, physical examination, demographics, laboratory tests, type of surgery, postoperative complications and length of stay. None of the patients received preoperative transfusion. Nine patients were excluded due to missing data and eight of them were excluded due to their unstable condition.

Results: The 202 patients group was consisted of 58% of patients underwent isolated coronary artery bypass graft surgery (CABG), 22% underwent single valve procedure, 10% combined CABG and valve surgery and 10% other types of operations. The prevalence of preoperation anemia, defined as hemoglobin <12 g/dl, was 33.6%. The mean preoperative hemoglobin (Hb) concentration was 12.7 g/dl. A statistic analysis was performed and the results show that low Hb levels are significantly associated with adverse outcome. Anemic patients undergoing cardiac surgery have higher mortality rates ($\rho = -0.327$, $P = 0.003$) and higher levels of amylase ($\rho = -0.24$, $P = 0.032$) and bilirubin ($\rho = -0.304$, $P = 0.006$) due to, probably, dysfunction of the liver and pancreas.

Conclusions: Preoperative anemia in patients undergoing cardiac surgery with CPB is significantly associated with adverse outcomes. The increased hemodilution in CPB is probably associated with inadequate oxygen delivery causing ischemic and/or inflammatory organ injury. Further studies must investigate whether treating the preoperation Hb would improve the outcome of anemic patients undergoing cardiac surgery.

C10-6

PREDICTING SURVIVAL FOLLOWING MAJOR COMPLICATION(S) IN CARDIAC SURGICAL PATIENTS

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Objectives: This study was designed to investigate the incidence of, and the survival impact of major complications in patients following cardiac surgery. In addition, we determined independent predictors of hospital mortality in order to create a model that could serve as a tool for the prediction of survival in this patient population.

Methods: We retrospectively analyzed prospectively collected data of 6641 patients (mean age 64 ± 14 years, $n = 2499$; 38% female) who underwent cardiac surgery between January 1998 and December 2006. Six major complications were studied: respiratory failure, sepsis, renal failure, mediastinitis, gastrointestinal event, and stroke. Their impact on hospital mortality, hospital length of stay and late survival using multivariate regression models was determined.

Results: A total of 1354 complications were observed in 826 (12.4%) patients. The most frequent complication was respiratory failure ($n = 634$; 9.5%) followed by sepsis ($n = 202$; 3%) and stroke ($n = 163$; 2.5%), renal failure ($n = 145$; 2.2%), mediastinitis ($n = 111$; 1.7%), gastrointestinal complications ($n = 99$; 1.5%). Hospital mortality increased with the number of complications (control group-no complication: 1.6% ($n = 92/5815$); single: 12% ($n = 58/485$), double: 25.5% ($n = 52/204$), three or more: 40% ($n = 55/137$)). Ten preoperative and five postoperative predictors of hospital mortality were identified and included into the logistic model which accurately predicted outcome in the study population and the validation cohort (c-statistic: 0.866 and 0.892, $P = 0.716$). Length of stay was 9 ± 10 days, 28 ± 27 days, 46 ± 40 days and 64 ± 48 days in control group and those patients with 1, 2, and 3 or more complications, respectively ($P = 0.001$). Long-term survival was significantly decreased with the increasing number of complications and total length of stay.

Conclusions: With a worsening in the risk profile of patients undergoing cardiac surgery, an increasing number of patients develop major complication(s) leading to increased hospital stay and mortality, which is proportional to the number and severity of these complications. Our predictive model based on pre- and postoperative variables allowed us to determine with accuracy the hospital mortality in critically ill patients after cardiac surgery.

C10-7

RENAL PROTECTION IN CARDIAC SURGERY PATIENTS WITH RENAL DYSFUNCTION

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Objectives: Patients with renal dysfunction are prone to develop more deterioration in their renal function or acute renal failure after cardiopulmonary bypass. To prevent or reduce the incidence of post cardiac surgery renal failure and therefore, its morbidity and mortality, the protective effect of perioperative Dopamine and Lasix was tested in this study.

Methods: One hundred and twenty patients with renal dysfunction (Creatinine level more than one and a half above normal value (High normal value: 110 mmol/l) and not on dialysis were included in the study. Other criteria include: EF >30%, coronary artery disease required two or more coronary artery bypass grafts. The patients were divided in to two well statistically matched groups of 60 patients each. Group (I): given Dopamine I.V. 2.5-5 Ug/kg/min at the beginning of the surgery, followed by Lasix 5-10 mg/min postoperatively on the arrival to the Intensive care unit. Group (II) did not receive Lasix drip, Dopamine drip was needed in 14 patients in this group for hemodynamic reasons. Creatinine and Urea levels as well as the need for dialysis were monitored in both groups. Statistical analysis of the results was conducted and the statistical significant values were determined with a $P < 0.05$.

Results: 1) Creatinine and Urea rise occurred in all patients. The degree of the rise was 6-55% in group (I) and 11-157% in group (II), $P < 0.001$.

2) Hemodialysis was needed in two patients in group (I), and in nine patients of group (II) $P < 0.001$.

Conclusions: The data of this study indicates that the use of perioperative I.V. Dopamine and Lasix has a significant renal protective effect in this kind of patients.

C10-8

INTRAVASCULAR CATHETER COLONIZATION AND RELATED BLOODSTREAM INFECTION IN THE HEART SURGERY INTENSIVE CARE UNIT

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Objectives: Catheter related infection (CRI) is one of the most serious complications of the use of central venous catheters (CVCs) and arterial catheters (ACs), with an incidence of 2-30/1000 days in different studies. No prospective study has evaluated the rate of CRI in cardiac surgery intensive care unit (SICU) in Iran. Since 2006, we have had a through program for the insertion and care of all catheters used at cardiac SICU. Our purpose was to study the incidence of catheter tip colonization, CRI, their risk factors, and to compare these data with other studies.

Methods: We studied prospectively 183 catheters in 150 patients in relation to insertion data and catheter characteristics, catheterization time and microbiological cultures. These catheters were in place for >48 h over a 16 months period. Risk factors were analyzed by multivariate analysis.

Results: The analysis included 115 CVCs, 65 ACs and 3 PACs inserted in 150 patients. The median time of catheter placement was four days. The incidence of positive tip culture was 9.8% and ten microorganism isolated from 18 colonized catheters. Thirteen Gram-negative bacilli, four Gram-positive cocci and one yeast were isolated. Escherchia coli was the dominant isolated (27.7%). From multivariate analysis, >6 days of catheterization and insertion site were the variables associated with significantly increased risk of catheter colonization.

Conclusions: Gram-negative bacilli and Gram-positive cocci are the commonest microorganisms colonizing CVC and AC from cardiac SICU patients. Duration of catheterization and catheter insertion site were independent risk factors of catheter related infection.

April 26th, 2008 3rd Congress Day

11:30-13:00

5th Vascular Scientific Session - Peripheral II

V5-1

WILL FEMORO-POPLITEAL BYPASS BECOME OBSOLETE? A STUDY OF INFRA-INGUINAL STENTING IN PERIPHERAL ARTERIAL OCCLUSIVE DISEASE

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Objectives: Traditionally, long infra-inguinal arterial occlusions have been treated by surgical by-pass. Recent advances in self-expanding Nitinol stent technology have made stenting of such lesions technically possible, with encouraging long-term patency rates. The aims of this study were to examine the feasibility and long-term outcome following infra-inguinal, intra-arterial stenting in peripheral arterial occlusive disease.

Methods: Patients undergoing infra-inguinal, intra-luminal arterial stenting in a single specialist endovascular centre were followed-up for one year (mean 6 months [SD5]) or until primary end-point of stent occlusion or death. Demographic, technical and out-come data was entered prospectively on a database. Patency was confirmed by Duplex ultrasound examination, resolution of symptoms and/or ulcer healing.

Results: One hundred legs were stented (M:F 59: 41, median age 75 [41-97], Fontaine stage IIb [41%], III [16%], IV [43%], diabetic [26%]) between November 2004 and Jan 2007. Median lesion length (range) was 21 cm (4-66). TASC II classification (n): A (5), B (16), C (32), D (47). Stenting was performed for rescue of failed angioplasty in 88%. Recanalisation rates of 97% were achieved (sub-intimal in 80%). Patency at six months and one year was 75% and 65%, respectively. Mortality rate at one year was 27%. Fourteen percent required major amputation.

Conclusions: Intra-luminal stenting of long infra-inguinal occlusive lesions is feasible with good primary success rates. Patency appears durable. Stenting of the SFA and popliteal arteries should be considered as a viable alternative to femoro-popliteal bypass for limb salvage, particularly in patients with high anaesthetic risk.

V5-2

AUTOGENOUS AORTOFEMORAL RECONSTRUCTION IN PROSTHETIC VASCULAR GRAFT INFECTION; HOW TO MANAGE?

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Objectives: Aorta-femoral artery bypass operation is the first choice for the treatment of aortoiliac occlusive disease. This operation can be done successfully with increasing experience. Prosthetic aortic graft infection is a devastating complication of this procedure with increasing mortality and morbidity.

Methods: Between October 2001-March 2007, 452 patients were treated for aortoiliac occlusive disease using bifurcated vascular graft. Twenty-one patients, nine from our clinic and 12 patients from other centers were treated for aortic graft infection. Ten of these patient had aortobifemoral bypass operation and 11 had aortobifemoral bypass and femoropopliteal bypass operation before. Treatment was performed complete prosthetic excision and revascularisation with either autolog or bioprothesis if needed. The surgical approach was transperitoneal for 15 patients and retroperitoneal for six patients. The objective criteria for revascularisation was the femoral artery backflow. Nine patients with inadequate back flow were treated with aorto femoral by pass using saphenous vein, and obturator by pass was performed in two patients. Four patient had adequate femoral backflow and only saphenous patchplasty were performed. Five patients with critical limb ischemia had an additional saphenous vein bypass. Two of these patients had aortofemoral bypass using bioprothesis after the saphenous vein graft failure.

Results: One patient with high creatinine level died in the early postoperative period. Two patients had amputations due to inadequate arterial flow. Five patients had reoperation with syntetic vascular prothesis after infection healed. **Conclusions:** Aortofemoral prosthetic graft infection is a distressing complication for surgeons and patients. Autogenous saphenous vein graft for reconstruction of the aorta and femoral artery is a good option for these patients. Bioprothesis also relies as an alternative method in whom autolog graft is not an option. We believe that vascular graft infections can be treated with successful results in experienced centers.

V5-3

AORTOBIFEMORAL BYPASS GRAFTING USING EXPANDED POLYTETRAFLUOROETHYLENE STRETCH GRAFTS IN PATIENTS WITH OCCLUSIVE ATHEROSCLEROTIC DISEASE

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Objectives: The aim of this prospective study was to evaluate the performance of bifurcated, longitudinally extensible (stretch), expanded polytetrafluoroethylene (ePTFE) grafts implanted in patients with aortoiliac or aortofemoral occlusive atherosclerotic disease.

Methods: Between October 1991 and December 2005, 822 patients (708 men, 114 women; mean age, 63.8 years) underwent aortoiliac or aortofemoral reconstruction using a bifurcated ePTFE stretch graft. Preoperatively, all patients had ultrasonographic and arteriographic evaluations and were divided into groups according to the TASC II morphological stratification of iliac lesions. Seventy-seven patients (9.4%) had type B lesions, 314 (38.2%) patients had type C lesions and 431 (52.4%) were classified as type D lesions. Endarterectomy of the aorta was required in 172 patients (21%); femoral arteries were endarterectomized in 222 (27%). Femoropopliteal bypass grafting was performed in 18 patients, aortorenal bypass in 12, and mesenteric artery grafting in 1.

Results: One patient died perioperatively of a myocardial infarction. Perioperative morbidity included cardiac (2.2% of patients), respiratory (0.9%), and gastrointestinal complications (1.2%), as well as acute renal insufficiency (1.3%). Seven patients had bleeding requiring surgical revision within the first 24 h after surgery. There were four cases (0.5%) of immediate graft thrombosis and five (0.6%) of single-limb graft thrombosis. During a mean follow-up time of 37 months (range, 1-162 months), 58 patients (7.1%) were lost to follow-up and 205 patients (24.9%) died. The primary and secondary graft-patency rates during the observation period were 90.6% and 97.9%, respectively. Twelve late graft occlusions resolved after thrombectomy alone. Eleven cases of single-limb late thrombosis resolved after thrombectomy and profundoplasty. Limb-salvage rate during the observation period in patients who underwent operation for critical limb ischemia was 84.5%. There were nine postoperative graft infections (1.1% infection rate) in the series.

Conclusions: Our long-term experience with ePTFE stretch grafts in aortoiliac and aortofemoral reconstruction shows that these prostheses have a high rate of patency and a low rate of graft-related complications. The physical characteristics of the grafts may help to reduce postoperative graft infection.

V5-4

IMPLANTATION OF AUTOLOGOUS BONE MARROW CELLS IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Objectives: Patient with critical ischemia who are not candidate for invasive revascularization have impending limb loss. About 30% of patients with critical limb ischemia cannot be treated by any methods and the only option is amputation. We showed that metabolic intervention with antioxidant and L-arginine can enhance beneficial effects with implantation of bone marrow cells (BMCs). We performed a long-term controlled trial to assess the safety and efficacy of intrarterial autologous implantation of bone marrow cells (BMC) infusion with oral vitamin E and C and L-arginine in patients with Chronic peripheral arterial disease.

Methods: We enrolled 18 patient with critical limb ischemia. All patient had intermittent claudication, rest pain, ischemic ulcers and were not candidates for surgical revascularization. Exclusion criteria were malignant disease, myocardial infarction or brain infarction, sever heart failure. Total mononucleated cells obtained from the patient ranged from 13.3 to 60.3 $\times 10^6$ cells. The infusomat fm5 braun infusion pump was used. Two doses of implantation of bone marrow cells (BMCs) (time 0 and 45 days) were injected in the common femoral artery of the affected leg. After 30 days the patients received 400 UI vitamin E, 1 g of vitamin C and 2 g of L-arginine. The end point were the leg salvage, improvement of ulcers, improvement of pain. After admission (T0) all patient were seen at 3-6-12-18 (T1-2-3-4) months.

Results: Patients treated safely and no serious reaction, were observed during this study: at T1, T2 time point follow-up the ABI value increased in 10 patients and 13 patients at T4. Twelve showed a decreased of the pain score at T3 and T4. The improvement of the pain free walking distance was consistent at T2, T3, T4. Laser Doppler index, which reflect microcirculation, were also significantly improved between T3, T4 after treatment. Similarly, an improvement of the venousarteriolar reflex activation was observed with Laser Doppler evaluation which resulted normalized completely in eight cases. More important after one year the number of neocapillaries increased significantly in tibia toe and foot. Finally, angiographic evaluation illustrated collateral vessel formation at six months.

Conclusions: Results showed significant improvements in the ABI, ulcers healing, maximum walking distance, microcirculation blood flow. Metabolic intervention with antioxidants and L-arginine could help the differentiation of BMCs. In the study we show that BMC arterial infusion together with meta-

bolic intervention is a long-term safe and effective therapeutic procedures in improving major clinical indexes and enhancing neovascularization capacity represent a promising therapeutic approach.

V5-5

LONG-TERM PLAVIX CLOPIDOGREL ADMINISTRATION INCREASES WALKING DISTANCE AND ANKLE BLOOD PRESSURE IN CLAUDICANTS: A 10-YEAR STUDY

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Objectives: The effects of clopidogrel, an antiplatelet agent, on painfree and maximal walking distances (PWD, MWD) and ankle brachial index (ABI) in patients (patients) with PAOD were assessed in a long-term controlled trial. **Methods:** The patients with typical intermittent claudication for six months or more were selected in this trial, standardized PWD 200 m or less, ABI at worst leg 0.7 or less with further decrease after exercise. Six hundred and fifty-nine patients received clopidogrel (75 mg b. i. d.) (first group) and 572 patients received Aspirin (250 mg i.d.) (second group) from 28 to 122 months (medium 77 months).

Results: Analysis of the results in an intention to treat approach showed progressive enhancement of both PWD and MWD in the first group, consistently greater than in the second group ($P < 0.005$ to 0.001). ABI values at rest and after exercise moderately but consistently increased in the first group and decreased in the second, with significant intergroup differences ($P < 0.01$ to 0.001). Gastrointestinal bleeding was observed in 12 (1.8%) patients of the first group and in 61 (10.7%) patients of the second group ($P < 0.05$). Amputations took place in long-term period in 21 (3.2%) patients of first group and in 43 (7.5%) patients of the second group ($P < 0.05$). Myocardial infarction was observed in 48 (7.2%) patients of the first group and in 61 (10.7%) patients of the second group ($P < 0.001$). Stroke occurred in 61 (9.2%) patients of the first group and in 84 (14.7%) patients of the second group ($P < 0.01$).

Conclusions: The results demonstrate that Clopidogrel is effective in modifying the natural course of intermittent claudication and improving the flow conditions in the legs of these patients.

V5-6

PATENCY RATES FOR AXILLOFEMORAL BYPASS FOR AORTOILIAC OCCLUSIVE DISEASE

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Objectives: This report summarizes our institutional experience with axillofemoral bypass and evaluates the patency rates and risk of graft occlusion after axillofemoral bypass.

Methods: During 2001 and 2007, 27 patients received axillo femoral extra anatomic bypass for chronic severe aortailiac occlusive disease in our institution. Patient demographics, risk factors, indication for surgery and outcomes were recorded. The follow-up was performed with a median of 38 months.

Results: All of the patients were men who were between the ages of 50 to 77 years with a mean of 65 years. Ten of the 27 patients returned with claudication readmitted in the first 16 months. Five of these patients had gangrene in the distal lower extremity. Of the 10 patients seven received embolectomy but in only four a successful outcome was gained. Seven patients had graft occlusions with rest pain and in three of these further distal bypass was performed. Of the 17 patients, three had graft infection. For the rest, medical treatment was the choice. Three of the patients died because of cardiac or non-cardiac problems. Only seven of the patients were found with a patent axillo femoral graft. The risk factors were determined as elder age, diabetes and renal failure.

Conclusions: The patency of axillo femoral extra anatomic bypass graft operation is crucial in some patients and may be the only way for limb salvage. Nevertheless, long-term results in means of patency and relief of symptoms, are not satisfactory.

V5-7

NEW RESULTS OF SUBINTIMAL BALLOON ANGIOPLASTY AS ONE OF A NEW METHODS IN TREATMENT OF PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Objectives: Critical limb ischemia is still one of the most dramatic artery diseases, which still have very high level of disability. Subintimal balloon angioplasty has proved to be validate and efficient kind of treatment. Present research is made to define opportunities of subintimal balloon angioplasty in treatment of patients with critical limb ischemia.

Methods: At cardiovascular surgical clinic 650 patients with critical limb ischemia were on treatment and research. Subintimal angioplasty (SA) of peripheral arteries was applied as surgical procedure for 43 (6.6%) patients. Average age of these patients was 72 years. Duration of period of critical limb ischemia was more than three months. Degree of ischemia was 4-5 categories on Rutherford and 3-4 categories on Fontein-Pokrovsky. In total 57 procedures of subintimal balloon angioplasty of the following arteries were done: 12 - iliac, superficial femoral and tibial arteries, 35 - superficial femoral and distal arteries of the leg and 10 - tibioperoneal trunk and tibial arteries.

Results: During the first month after the procedure the reconstructed arteries were possible in 76.2% ($n=28$) of patients. Thrombosis in the zone of subintimal angioplasty in the early postoperative period was observed in 23.8% ($n=9$) of the patients. Successful thrombectomies from iliac and femoral segments and thrombectomies from femoral and popliteal segments were performed in five of these patients, in the rest of these patients- iliac and femoral prosthetics with femoropropofundoplasty (2 cases) or endarterectomy from iliac and femoral segment in combination with femoropropofundoplasty (2 cases). Amputation at the level of the middle of the thigh was necessary in 4 patients (10.5%), below knee amputation in 1 case (2.3%), amputation of the foot in 1 case (2.3%). Due to ischemic stroke died one of our patients.

Conclusions: The applied new technological method of treatment of occlusion and stenotic defects of peripheral arteries of the leg demands further investigation of its effectiveness in patients with critical limb ischemia. This method obviously reduces risk of lethal outcome during and after surgical procedure and gives a chance to reduce rate of disability in patients with critical limb ischemia. Our first positive results testify perspective of this method.

V5-8

RISK FACTORS AND CARDIOVASCULAR PROGNOSIS OF PATIENTS WITH PERIPHERAL ARTERIAL DISEASE DIFFER ACCORDING TO THE DISEASE LOCALIZATION

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Objectives: Peripheral arterial disease (PAD) is associated with poor cardiovascular (CV) prognosis. It is unknown whether this prognosis could differ according to PAD lesions topography.

Methods: We reviewed the data of all patients who underwent a first lower limbs angiography between January 2000 and December 2005 in our hospital. Arterial stenoses $>50\%$ were located by two experienced vascular physicians. Following events were collected until 04/2007: death, non-fatal myocardial infarction or stroke, coronary or carotid revascularisation. The primary outcome combined all adverse events.

Results: We studied 400 PAD cases (age 68.3 ± 12.3 year, 77.5% males). Aorto-iliac disease (AI-PAD) and infra-iliac disease were noted in 211 (52.8%) and 251 (62.8%) cases, respectively. Male sex and smoking were more prevalent in AI-PAD while older age, diabetes, hypertension, renal failure and critical ischemia were significantly more prevalent in infra-iliac disease ($P < 0.05$). During the follow-up period, the event-free survival curves differed according to PAD topography. Adjusted to age, sex, CV disease history and risk factors, critical ischemia and treatments, AI-PAD was significantly associated to worse prognosis (primary outcome: OR=3.28, death: OR=3.18, $P < 0.002$).

Conclusions: The association between CV risk factors and PAD differs according to the lesions localization. This is the first study reporting the worse general prognosis of aorto-iliac disease vs. distal PAD, independent of risk factors and comorbidities.

V5-9

COMBINED TREATMENT WITH ILOPROST DURING FEMORO-POPLITEAL BYPASS SURGERY

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Objectives: Patients with lower limb arterial disease in advanced Leriche-Fontan class may have disappointing results after surgical revascularization. Despite maximal medical therapy and best standard-of-care surgical treatment, coexistence of diabetes mellitus or necrotic lesions represent a marker of suboptimal results in terms of relief of symptoms and risk of amputation. Herein we present a combined treatment strategy comprising surgical revascularization and locoregional intraarterial infusion of prostanoil iloprost trometamol.

Methods: Ten patients in either Fontane class III (6 individuals) or class IV (4 individuals), aged 65 to 80 years and having surgical indication were prospectively enrolled. All patients received preoperative iloprost infusion (1.5 ng/kg/min for 6 h during 12 consecutive days). Supraaortic femoropopliteal bypass surgery was performed in six cases (Goretex stented prosthesis in five and autologous great saphenous vein in 1) and infraaortic operation was done in the remaining four cases (Goretex stented prosthesis in two and autologous great saphenous vein in 2). Intraoperatively, iloprost trometamol 3.000 ng were infused through the graft. One month after the operation, an additional iloprost infusion (1 ng/kg/min during 6 consecutive days) was performed. Echo-Doppler evaluation of the blood flow, flow velocity and resistance index in the posterior tibial artery and in the pedial artery was accomplished at the following timepoints: before treatment with iloprost, 30 min after release of the arterial clamps, six days and one month postoperatively.

Results: Follow-up was 100% complete. An average 20% decrease in resistance index was observed between timepoint one and timepoint 4 (from 0.55 to 0.45, average measurements). Distal flow was increased by an average of 50%. Patients reported relief of symptoms (ischemic pain), increased walking distance and complete resolution of necrotic areas. Improvement in lower limb motility and sensitivity was also reported by all study subjects.

Conclusions: The combined treatment of surgical revascularization and the presented infusional protocol of iloprost trometamol achieves optimal results in patients with advanced lower limb arterial disease (Leriche-Fontane class III or IV). Clinically significant improvements of blood flow, ischemic symptoms and limb function are associated with this combined treatment strategy. Evaluation in larger patients subsets is prompted.

V5-10

ISOLATED ILIAC ARTERY ANEURYSMS. CLINICAL PRESENTATION AND THERAPEUTICAL APPROACH

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Objectives: Isolated Iliac Artery Aneurysms (IIAA) are rare with an incidence <2%. Up to date there is no consensus about some aspects of their management. We retrospectively reviewed our experience.

Methods: From January 1995 to December 2006 we treated 23 IIAA in 18 patients. Parametrical variables were analyzed by two test and continuous variables by *t*-student test.

Results: All 18 patients were men with a mean age of 69 years (S.D.±9.2). The mean diameter was 5.1 cm (range 3-8 cm). Eight patients (44.5%) had elective and 10 patients (55.5%) had urgent treatment to repair IIAA with mean diameter, respectively, of 5.4 cm and 4.9 cm, respectively (*P*>0.05). They were involved 18 (78%) Common iliac arteries, 1 (4.5%) external iliac artery and 4 (17.5%) internal iliac arteries. Ten patients (55.5%) complained of abdominal symptoms because the rupture or fissuration of the IIAA. Three patients (13%) presented a bilateral aneurysm. At the admittance, 1 patients (4.5%) was shocked. An aorto-bifemoral graft and aorto-biliac graft were performed in 2 patients (11%) and in 2 patients (11%), respectively. A common iliac graft, a common iliac to external-internal graft, a common iliac-external graft with ipogastric artery exclusion and IIAA ligation. There were three postoperative deaths due to cardiac failure in patients with coronaropathy, with 16.5% cumulative postoperative mortality rate. All the postoperative deaths were in symptomatic patients with 30% ruptured IIAA postoperative mortality rate. In the postoperative period they survived: 8 out 8 (100%) asymptomatic patients vs. 7 patients out 10 (70%) symptomatics, (*P*<0.05); 2 out 4 patients (50%) with bilateral IIAA vs. 13 out 14 patients (93%) with monolateral aneurysm (*P*<0.05); 6 out 9 patients (66.5%) with ruptured IIAA vs. 9 out 9 patients (100%) with intact IIAA (*P*<0.05); 2 out 4 patients (50%) treated by bifurcated aortic

reconstruction vs. 11 out 12 (92%) patients treated by iliac reconstruction; 13 out 16 patients (81%) treated surgically vs. 2 out 2 patients (100%) treated by endovascular approach (*P*<0.05).

Conclusions: IIAA are not frequent but are burdened with high mortality rate in case of rupture (30% in our experience). Postoperative follow-up is basic not only for the reconstruction patency surveillance but also for the potential enlargement of the aorta and the contralateral iliac artery.

April 26th, 2008 3rd Congress Day

11:30-13:00

5th bis Vascular Scientific Session - Abdominal Aorta Aneurysms

V5bis-1

SHORT LEUKOCYTE TELOMERE LENGTH IS ASSOCIATED WITH ABDOMINAL AORTIC ANEURYSM

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Objectives: Telomeres are specialised DNA structures present at the ends of chromosomes. The telomere length shortens with each cell division and represents cellular biological age. A variety of environmental, haemodynamic and genetic factors has been implicated in the pathogenesis of abdominal aortic aneurysm (AAA). The aim of this study was to determine the relationship between abdominal aortic aneurysm and white cell telomere length.

Methods: Peripheral blood samples were collected from 112 male patients with AAA and 112 age matched screened male controls. Genomic DNA was extracted from the buffy coat and digested with restriction enzymes (Rsa 1 and Hinf 1). The DNA fragments were separated on 0.5% agarose gel electrophoresis at 150 vs. for one hour and 50 vs. for 18 h and then transferred to a nylon membrane using southern blotting. The DNA fragments were hybridised with a telomere repeat specific Digoxigenin (DIG) labelled probe and incubated with DIG specific antibody coupled with alkaline phosphatase. The telomere length was then measured using a chemiluminescence technique with telo TAGGG telomere length assay kit (Roche applied science). Data was analysed using student's *t*-test and Pearson correlation using SPSS v14.0.

Results: Median age of cases and controls was 66 years (range 60 to 87 years). The mean white cell telomere length was significantly lower in patients with AAA (5486 base pairs (bp)) compared to controls (5827 bp). The difference in telomere length between the cases and controls was 340 base pairs (95% confidence interval 463 bp to 217 bp) (*P*=0.000). There was a significant negative correlation between the size of AAA and telomere length (larger AAA had shorter telomere length) $9R = -0.274$, $n = 112$, $P = 0.009$.

Conclusions: Patients with abdominal aortic aneurysms have significantly shorter telomere lengths compared to healthy controls. In patients with AAA, aortic size is negatively associated with telomere length. This suggests that cellular biological aging may have a role in the pathogenesis and progression of AAA.

V5bis-2

EFFECTS OF INFRARENAL AND HIATAL CLAMPING IN REPAIR OF RUPTURED ABDOMINAL AORTIC ANEURYSMS

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Objectives: Infraarenal clamping of the aorta which seems possible in the preoperative evaluation can not be performed everytime in the repair of ruptured abdominal aortic aneurysm, because of CT technique, differences in interpretation and inadequate cooperation of the patient. Aim of our study was to evaluate comparatively the results and safety of routine hiatal clamping as a first choice with those of infraarenal clamping.

Methods: The records of 122 patients with mean age of 69.4±9.2 years who had undergone ruptured abdominal aortic aneurysm repair between 1994-2007 were evaluated retrospectively. Hiatal clamping and infraarenal clamping were performed in 96 patients and 26 patients, respectively. By

univariate and multivariate statistical analyses of respiratory, renal, gastrointestinal, cardiac complications, relaparotomy, infection, mortality, cell saver usage, blood and blood product requirements, and hospitalization time were evaluated comparatively between two groups.

Results: Overall mortality was 40 (32.8%) and there was not any difference between two groups. Univariate analyses revealed that hospitalization time ($P=0.008$), postoperative respiratory complications ($P=0.006$), blood requirement ($P=0.009$), and cell-saver usage ($P<0.001$) were significantly higher in the hiatal clamping group. Multivariate analysis was also performed, since cell saver usage which had been found higher in the hiatal group, was also found related to postoperative respiratory complications ($P=0.042$), and prolonged hospitalization time ($P=0.04$). Prolonged renal ischemia time (>30 min) of hiatal group was an independent risk factor for renal complications ($P=0.04$), blood usage ($P=0.005$), and mortality ($P<0.001$) in this group. If hospital mortalities were excluded, 5-year and 10-year cumulative survivals were 59.94%, 5.66% and 39.18%, 6.13%, respectively. Cross-clamp level had not a significant effect on long-term survival. Cardiac event in follow-up was only independent predictor of late deaths and long-term survival.

Conclusions: Hiatal clamping which is performed without any delay for infrarenal aortic exploration is not a significant risk factor in the repair of ruptured abdominal aortic aneurysm, provided clamping time is under 30 min. It can be performed safely and provides more comfortable operative conditions.

V5bis-3

AORTO-ILIAC RECONSTRUCTION PRIOR TO KIDNEY TRANSPLANTATION

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Objectives: Atherosclerosis or severe calcification of recipient iliac arteries is considered contraindication for kidney transplantation. On the other hand, it is common in end stage kidney disease patients on dialysis. Nowadays, since renal transplantation is increasingly successful, extended indications are accepted on the waiting list including patients with severe atherosclerosis. This requires vascular procedure prior to kidney transplantation or during the same operation. The aim of the study was to present our experience with aorto-iliac reconstruction prior to kidney transplantation.

Methods: There were eight atherosclerotic, uremic patients referred to our Department as a candidates for kidney transplantation. All were refused waiting list inclusion due to occlusive lesions of iliac arteries or distal part of the aorta. There were seven male and one female, age 45-62 years, all current or past smokers. Preoperative assessment consisted of Doppler ultrasound and angio-CT scan. Reconstruction of blood supply was performed with aorto-bi-iliac in five, aorto-bi-femoral in two and ilio-femoral graft in one patient under general anesthesia.

Results: There was no major postoperative complications. Patients were discharged and placed on a special waiting list. Six of them received kidney allograft including one living-related transplantation. All procedures were made with transplanted kidney artery anastomosis to the side of the prosthesis. No patient developed signs of arterial graft infection. In postoperative period there was no arterial or renal allograft related complications except delayed kidney function in two cases. Remaining two patients are still on waiting list four and six months after vascular procedure.

Conclusions: Adequate vascular reconstruction in uremic patients with severe atherosclerotic lesions of iliac vessels allows safe and durable kidney transplantation.

V5bis-4

OUTCOME IN CIRRHOTIC PATIENTS AFTER SURGICAL REPAIR OF INFRARENAL AORTIC ANEURYSM

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Objectives: Abdominal surgery in patients with advanced liver disease has been reported to be associated with high morbidity and mortality rates. However, the surgical risk of infrarenal aortic aneurysm (AAA) repair in cirrhotics

remains ill defined. We reviewed our experience to investigate the predictors of the outcome in cirrhotic patients after elective AAA open repair.

Methods: Between January 2001 and March 2006, 1189 patients underwent elective open repair of infrarenal AAA and 24 (2%) had a biopsy-proven cirrhosis (23 M; 1 F; mean age 68 ± 7 years). The latter were retrospectively stratified according to the Child-Turcotte-Pugh (CTP) score and the Model for End-Stage Liver Disease (MELD) score. Operative variables and perioperative complications were recorded and compared to those of concurrent non-cirrhotic controls matched by gender, age, aneurysm size and type of reconstruction. Prognostic value of CTP and MELD scores was evaluated.

Results: No intraoperative or 30-day deaths were recorded. No significant differences in terms of major perioperative complications ($P=0.74$) were observed between cirrhotic patients and controls. Operative time (162 ± 49 min vs. 126 ± 33 min, $P=0.006$) was significantly longer in cirrhotics. Intraoperative blood transfusion requirements were higher in the study group (273 ± 352 ml vs. 89 ± 214 ml, $P=0.045$). Hospital length of stay was nearly doubled in cirrhotic patients (11.0 ± 2.8 days vs. 5.7 ± 1.5 days; $P<0.0001$). Twenty-two cirrhotic patients were classified as Child A and two as Child B. Median MELD score was 8 (range 6-14). Child B class was a predictor of higher intraoperative blood transfusion requirement (340 ± 297 ml vs. 35 ± 98 ml, $P=0.0041$). At a mean follow-up of 27 ± 24 months, five deaths were recorded (20.8%). Both Child B patients died within six months. Child's class B and a MELD score >10 were associated with reduced mid-term survival rates ($P<0.0001$ and $P=0.02$, respectively).

Conclusions: In our experience, open AAA repair in cirrhotics was safely performed with an acceptable increase of the magnitude of the operation. However, the reduced life expectancy of subgroups of patients identified by means of prognostic models raises a word of caution in patient selection.

V5bis-5

MODELLING BIOLOGICAL VARIABILITY AND NON-LINEAR GROWTH IN A COMPLEX PHENOTYPE: APPLICATION TO ABDOMINAL AORTIC ANEURYSM EXPANSION

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Objectives: Abdominal aortic aneurysm (AAA) expansion has both prognostic and surgical decision implications. Aneurysm diameter is an independent predictor of all cause mortality in people with AAA. People with higher AAA diameters are at significant risk from rupture. Hence the current practice of surgical intervention at a diameter of 5.5 cm. Previous attempts at modelling AAA expansion have assumed a linear process and ignored the highly correlated nature of repeated measurements. Our objective is therefore, to model AAA expansion process using a hierarchical non-linear mixed effects regression methodology.

Methods: We recruited 354 white male caucasians with confirmed abdominal aortic aneurysms (AAA) into our study. We followed them up over a period of time and repeatedly measured their AAA maximum diameters with ultrasound and CT-scans. The maximum infra-renal aneurysm diameter was recorded at the time of measurement. People whose aneurysms exceeded 5.5 cm or became symptomatic were offered surgery. The minimum and maximum periods of follow-up were nine months and seven years, respectively. The minimum and maximum time-points of observations per person were 3 and 10. The data was organized in a longitudinal data format and missing data were assumed to be missing completely at random and therefore, were ignored. We used maximum likelihood methods accounting for the correlation between repeated measurements in individual patients. The choice of a non-linear multivariate regression technique was informed by the fact that a quadratic linear regression model out-performed a simple linear regression model in terms of information criteria. We adjusted for covariates such as sex, hypertension, smoking, ischaemic heart disease and chronic obstructive pulmonary disease (COPD).

Results: The AAA diameter at baseline was 3.036 cm (0.05) and the rate of expansion was 0.14 cm/year (0.008) $P<0.0001$. At baseline, people with hypertension have AAA that are 9% higher in diameter as compared with normotensives. However, smoking accounts for a 5% increase in baseline AAA diameter and copd, 3% ($P<0.001$). Using empirical bayes estimates we were also able to predict individual AAA diameters from their data. The individual specific variance was 11%.

Conclusions: Abdominal aortic aneurysm expansion shows inherent between-individual and within-individual variability and it is inappropriate to model

this 'stochastic' behaviour with linear approaches. Using non-linear mixed effects regression methods we have been able to model AAA expansion and extract individual specific diameters. Our findings are consistent with the commonly quoted 'small' AAA expansion rates.

V5bis-6

TREATMENT OF COMPLEX ABDOMINAL AORTIC ANEURYSMS

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Objectives: Elective surgical standard treatment of abdominal aortic aneurysm presents more difficulties when expert surgeons undergo at the same time into correction of visceral arteries lesions or into internal iliac arteries (especially in their distal tract when aneurismatic) or inferior mesenteric artery revascularization (as to prevent intestinal ischemia). Also visceral or vascular system congenital abnormalities (e.g. posterior left renal vein, abnormal or double vena cava, extra renal arteries etc.) and retroperitoneal inflammatory diseases make surgical repair harder. This study evaluated morbidity and mortality on perioperative outcome (30-day) in elective open abdominal aortic aneurysm repair on patients affected by abdominal aortic aneurysm associated with visceral or vascular abnormalities/lesions or undergoing to inferior mesenteric artery or internal iliac artery revascularization if compared with patients undergoing only open aneurysm repair.

Methods: Between January 2002 and December 2007, 190 patients with abdominal aortic aneurysm underwent open abdominal aortic aneurysm repair. Preoperative check-up screening consisted of thoraco-abdominal CT with intravenous contrast material, followed by angiography if aorto-iliac disease or abdominal angina existed. Patients were separated into two groups: group 1 ($n=45$, 23%), defined as complicated and group 2 ($n=145$, 77%) defined as standard. All patients had retroperitoneal approach and Dacron woven grafts were used for aorta and internal iliac arteries; Great Saphenous vein or polytetrafluoroethylene were used to repair visceral arteries. In Group 1, 10 patients (5.2%) underwent at the same time open aneurysm repair and inferior mesenteric artery revascularization by directly re-grafting this on aortic graft; 20 patients (10.5%) underwent open aortic surgery and Internal Iliac artery Dacron bypass grafting; 4 patients (2%) underwent open aortic surgery and renal artery revascularization; 4 patients (2%) underwent open aortic surgery and Superior Mesenteric artery revascularization; 5 patients (2.6%) underwent open aortic surgery and Inferior Mesenteric artery and Internal Iliac artery revascularization; 2 patients (1.05%) underwent open aneurysm repair and Celiac artery revascularization. In Group 2, 65 patients (34.2%) underwent open aortic surgery with prosthetic-graft replacement, 80 patients (42.1%) underwent open aortic surgery with aorto-bisiliac graft replacement.

Results: No differences have been between group 1 and group 2 about morbidity and mortality (Log rank-test $P>0.05$).

Conclusions: Perioperative mortality and morbidity of open aortic surgery done by expert surgeons in patients with complicated abdominal aortic aneurysm are the same if compared with patients affected only by abdominal aortic aneurysm without other complications. The only difference stays in operation time which is longer in first case.

V5bis-7

ABDOMINAL AORTIC ANEURYSM: A 5-YEAR EXPERIENCE IN THE NORTHWEST OF IRAN

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Objectives: Abdominal aortic aneurysm occurs as a result of degenerative change in arterial wall. We evaluated prospectively multifarious signs and feature in prognosis of 31 patients with Abdominal aortic aneurysm in Imam Hospital from 2000 to 2005.

Methods: In this analytic descriptive study, patients categorized into three groups; unruptured (10), unstable ruptured (9) and stable ruptured (12). All patients operated transperitoneally. Early postoperative mortality, morbidity and other prognostic factors were documented.

Results: Mean age was 67.1 ± 8.9 years. Early mortality was 77% of unstable ruptured, 25% of stable ruptured and 10% of unruptured group. Significant relation found between mortality and systolic blood pressure in admission and presence of dysfunction. Mean hospital and ICU stay were 9.1 ± 5.6 and 4.1 ± 2 , respectively. Distal embolization and renal failure were the main postoperative complications.

Conclusions: Incidence of abdominal aortic aneurysm has been increases. Mortality increases with ruptured aneurysms. It seems evaluation for early detection and operation to be an extremity.

April 26th, 2008 3rd Congress Day

11:30-13:00

6th Vascular Scientific Session - Case Review Session

V6-1

THORACIC AORTA ENDOGRAFT AS AN ADJUNCT TO RESECTION OF A LOCALLY INVASIVE TUMOR: A NEW INDICATION TO ENDOGRAFT

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Objectives: A 61-year-old male had a recurrent metastasis from porocarcinoma localized in the left lung and infiltrating the aortic wall. In 1995, the patient underwent a surgical resection of an eccrine porocarcinoma (EP), a malignant tumor arising from the sweat gland, localized in the neck region. In 1999, he underwent a left lower lobectomy for a single lung metastasis from EP. In December 2005, the patient presented with dyspnoea and persistent cough. CT-scan showed the presence of a mass occluding the left main bronchus and infiltrating the wall of descending aorta. Surgical excision of cancer was not feasible without concomitant resection of the infiltrated aortic wall and thoracic aorta repair. Traditional repair consisting in resection and graft interposition, also utilizing a cardiopulmonary bypass, presented a significant morbidity and mortality risk in a patient undergoing a redo thoracotomy and completion left pneumonectomy.

Methods: A thoracic endovascular graft (Zenith TX2 Thoracic TAA, Cook, Brisbane, Australia) 28 mm diameter and 120 mm length was placed distal to the left subclavian artery, covering the area involved by cancer infiltration with a safe proximal and distal 4 cm margin of normal aorta. The following day the patient underwent a completion left pneumonectomy together with resection of the infiltrated area of thoracic aorta, avoiding aortic clamping, resection and vascular graft anastomoses. The removed area included the adventitia and almost the full thickness the media, about 3 cm wide of 0.25 of aorta circumference. Margins were negative of tumor at frozen section examination.

Results: The final pathology confirmed the relapsing EP with infiltration into the adventitia of the aortic wall. The postoperative course was uneventful and the patient was discharged on X^o day. Adjuvant radiotherapy was delivered (total dose: 60 Gy) in the area of hilum and aortic invasion. The patient is well and free of disease 24 months after surgery.

Conclusions: Our experience showed that an aortic endograft can be a useful and safe tool to allow a combined resection of the lung and the infiltrated aortic wall without the need for thoracic aorta cross-clamping and graft replacement, potentially reducing morbidity and mortality associated with surgery. Further studies are necessary with longer follow-up to evaluate the potential of this technique, but we believe that, when a limited area of descending thoracic aorta is involved by tumor and the resected wall need to be replaced with a prosthetic graft, the use of endograft could represent an appropriate option.

V6-2

PERIVASCULAR ABSCESS OF THE CAROTID BIFURCATION WITH INFECTION OF THE ARTERIAL WALL BY SALMONELLAE

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Objectives: Mycotic aneurysms and infections of the arterial wall in carotid arteries are extremely rare. There are seven cases of carotid pseudoaneurysms and infection by Salmonellae in the literature.

Methods: We report a patient with infection of the arterial wall by salmonellae and perivascular abscess formation. A 77-year-old male was admitted to the ENT department due to unilateral swelling of the neck and fever.

Ultrasound and CT-angiography showed a contrast-enhancing tumor of the right-sided carotid bifurcation. In addition, there was a hemodynamically significant stenosis of the right internal carotid artery.

Results: Intraoperatively an abscess at the carotid bifurcation with arrosion of the vagal nerve was found. After abscess drainage the infected arterial wall was resected. The internal carotid artery was reconstructed by venous interposition. Microbiology assessment of the intraoperative sample showed *Salmonellae* group D. The postoperative course was uneventful except for an ipsilateral laryngeal nerve palsy with moderate hoarseness. Ultrasound investigation four weeks postoperatively showed no abnormalities. Phoniatic training continues.

Conclusions: Perivascular abscess of the carotid bifurcation with infection of the arterial wall by *Salmonellae* without aneurysm or pseudoaneurysm formation is possible. Operative treatment by experienced vascular surgeons with the option of replacement of the carotid artery is recommended.

V6-3

CHALLENGING ENDOVASCULAR REPAIR OF A PREVIOUS COARCTATION SURGERY: A CASE REPORT

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Objectives: Secondary repair of thoracic aorta surgery represents a challenging clinical situation. Endovascular treatment can simplify such approach.

Methods: An asymptomatic 42-year-old male was surgically treated due to an aortic coarctation 24 years before his admission. A big descending thoracic aortic anastomotic pseudoaneurysm was detected in a plain X-rays examination and the patient was referred to our institution. Associated arch dysplasia predicted a challenging approach. Two step repair was planned. First, a left carotid-subclavian artery and proximal ligature were performed for intentional coverage of the left subclavian artery to achieve a better proximal anchor and fixation for the stent-graft. In the second step, two days later, a thoracic endovascular repair was applied with a Bolton® Relay endovascular graft using a transfemoral access. Successful exclusion of the aneurysm was achieved. Patient was discharged 36 h later without any complication.

Results: A false aneurysm at the repair site of aortic coarctation is a very common complication in patients surgically treated with a Dacron patch. It would be repaired as soon as possible to avoid major complications. We consider endovascular therapy as a first choice in patients with aortic arch abnormalities or previous surgery due to less mortality and morbidity.

Conclusions: 1. Aortic arch dysplasia represents a challenge for endovascular repair. 2. Preoperative planning must be careful and supraortic trunk transposition should be applied to prevent accidental ostial coverage.

V6-4

HAEMOPTYSIS DUE TO A 'LOST' WIRE - A RARE COMPLICATION OF THE CAROTID STENTING

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Objectives: The endovascular treatment of carotid stenosis gains increasing acceptance among a part of vascular specialists. The peri-interventional stroke incidence, even if partially higher compared with CEA, can be reduced by the use of protection systems. However, these systems show their own complications. We report a case of a rare, potentially life-threatening complication due to a lost wire of protection device.

Methods: A 62-year-old man was submitted to our department with haemoptysis that appeared since a few months. He underwent at external hospital a stent PTA of the left ICA a year ago because of the asymptomatic high grade stenosis of the left ICA and a symptomatic occlusion of the right ICA. During the attempt to retract the inserted protection device, this got caught in the stent meshes. It was decided to correct the critical stenosis of the artery by the PTA with 5/20 balloon and a following implantation of a 7/30 mm carotid wallstent. Since the protection-system had become pressed in the vessel wall through the PTA and stent the introduction wire had to be left in situ.

Results: The CT showed the penetration of the trachea through the wire coming from the right side lateral from the Truncus brachiocephalicus as the cause of haemoptysis. A flexible bronchoscopy showed a wire penetrating from the right the middle third into the tracheal lumen with blood spots until into the periphery. The angiography showed the known occlusion of the

right ICA and moderate stenosis of the treated left ICA. A penetration of the aortic wall supracoliacally was seen in the abdominal aorta with a long loop and fixation of the wire. The treatment took place in several steps. A 10 cm long wire part could be rescued during a stiff bronchoscopy. The operative extraction of the stent together with the 'lost' protection system from the left-side ICA, including conventional CEA and Dacron patch was performed in loco-regional anesthesia. In the last step, the supracoliacal part of aorta was exposed and residual parts of the wire were removed. In the follow-up of one year the patient remained free from pulmonary, neurological and abdominal events.

Conclusions: The present case shows that the wide introduction of such new endovascular techniques as CAS is potentially associated with a high risk of occurrence of new unknown life-threatening complication. The necessity of the critical indication position and the use of these technologies in specialized centers appears justified.

V6-5

ENDOVASCULAR CORRECTION OF A DISTAL RE-ENTRY IN AN ISOLATED ABDOMINAL AORTIC DISSECTION - CASE REPORT

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Objectives: The endovascular approach is an important advance in the treatment of the complicated aortic dissection. But the re-entries still are a problem and in some circumstances its treatment is challenge. The objective of this work is to report a case of an endovascular correction of a distal re-entry in an isolated abdominal aortic dissection.

Results: A 60-year-old man who was treated from an abdominal aortic dissection, using an aorto monoiliac endograft up to the left external iliac artery and a fem-fem bypass, with occlusion of the right common iliac artery. In his third year of follow-up a distal persistent re-entry tear in the right hypogastric ostium was detected, with a continuous false lumen growth, that recommended its correction. It was necessary to use a creative alternative to preserve the pelvic circulation and the sexual function of the patient. A reverse U self-expandable covered stent was implanted connecting right external and internal iliac arteries, and the problem was solved without pelvic arterial impairment.

Conclusions: The preservation of the pelvic circulation is necessary because it is known that its interruption may have some serious consequences, and besides that the patient expressed his wish of keeping his sexual activity. The use of a flexible stent graft simplifies the procedures in complex circumstances.

V6-6

IDIOPATHIC SUPERIOR GLUTEAL ARTERY ANEURYSM IN A 40-DAY-OLD INFANT: FIRST CASE REPORT

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¹Operative Unit of Vascular and Endovascular Surgery, S Anna University Hospital, Ferrara, Italy; ²Doctorate School in Clinical Medicine and Surgery, University of Bologna, Italy

Objectives: Gluteal arteries aneurysms have never been described in infants. We describe the first case of an idiopathic superior gluteal artery aneurysm in a 40-day-old child.

Methods: A phenotypically normal 40-day-old female infant of a 35-year-old primipara was admitted to our Unit with the diagnosis of superior gluteal artery aneurysm. The patient had been delivered by caesarean section at 37 weeks gestation because of podalic presentation. At the third day of life she developed a persistent and worsening oedema of her left leg that was accompanied by a dark-bluish discoloration of the skin over the superomedial aspect of the ipsilateral thigh. There was no family background of vascular, autoimmune or connective tissue disease. She had no evidence of infection, arteritis, vascular or cardiac disease, autoimmune diseases, connective tissue disorders, or trauma. Duplex scan and magnetic resonance angiography (MRA) showed a 15x25 mm aneurysm arising from the left superior gluteal artery with compression and dislocation of the external iliac vein. Since MRA demonstrated a good collateral circulation to the gluteal territory we decided to perform an aneurysm ligation without reconstruction. Postoperatively, the patient recovered quickly and went home seven days later.

Results: One month after the operation, the patient was doing well, she had palpable distal pulses bilaterally and the oedema of the left leg was fully resolved. Duplex scan showed exclusion and thrombosis of the aneurysmal

sac, normal blood flow in the left iliac arteries, and patent left iliac vein. The patient has been therefore, examined every six months by means of duplex ultrasonography. Now, three years after the operation, the baby is well and living a normal life. The aneurysm has shrunk and is no longer visible on sonography.

Conclusions: Gluteal arteries aneurysms (GAAs) are uncommon and mostly are pseudoaneurysms. Up to now, only six cases of true GAAs have been reported and their aetiology was secondary to atherosclerosis, arteritis and infection. Also idiopathic arterial aneurysms in infancy are rare, being usually associated with other diseases or trauma. It is difficult to decide whether surgery should be performed in children with aneurysms and which surgical procedure to use. The use of prosthetic grafts carries the risk of infection and relative stenosis as the child grows. The choice of excluding the aneurysm by neck ligation proved to be an effective therapeutic option with an excellent outcome in order to eliminate potential complications of expansion, rupture and embolization.

V6-7

SUCCESSFUL ENDOVASCULAR REPAIR COMBINED SURGICAL PROCEDURE OF BLEEDING AORTODUODENAL FISTULA

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Objectives: Secondary aortoduodenal fistula is an uncommon but potentially fatal complication that can occur after aortic reconstruction surgery. It usually presents with catastrophic upper gastrointestinal hemorrhage. Taking into account the accompanying multiple co-morbidities of those patients, conventional open surgical repair carries out significant mortality and morbidity. This case report is a description of a successful combined endovascular and open surgical repair of an acutely ruptured aortoduodenal fistula in a 67-years-old male patient.

Methods: A 67-year-old man who had undergone repair of an infrarenal abdominal aortic aneurysm (AAA) with a Dacron tube graft five years before, was admitted to the emergency department with back pain over the last month. The patient was referred to the urologists with a working diagnosis of renal colic. Suddenly the following day the patient had an episode of a massive haematemesis and hypotension. An urgent gastroscopy revealed bright red blood sporting from the third part of the duodenum. An urgent computed tomographic scan (CT) with intravenous contrast and 5-mm slices revealed a para aortic thrombus and thickened aortic wall below origin of the renal arteries. The endovascular repair was carried out under general anesthesia, after full preparation for open surgery should conversion be required. A vertical groin incision was used to expose the left and the right common femoral arteries. The patient was fully anticoagulated with heparin at this time. A baseline angiogram was carried out to delineate the renal arteries. A Talent (Medtronic) main body AF 3016C155AX and contralateral iliac limb IW1416C90AX was successfully deployed.

Results: A gastroduodenoscopy performed two days postoperatively showed no bleeding from the third part of duodenum. A follow-up spiral CT-scan at three months showed the para aortic thrombus mass to be resolving with no evidence of endoleak.

Conclusions: The present report confirms that endovascular stentgrafting can be safely used as a treatment option in the management of aortoenteric fistulas. The result of this case report suggests that endovascular aortic stentgraft placement provides a safe and effective method of rapidly controlling an acutely bleeding aortoduodenal fistula.

V6-8

ACUTE ISCHEMIC STROKE IN A YOUNG WOMAN WITH INTERNAL CAROTID ARTERY THROMBOSIS: CASE REPORT

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Objectives: Acute ischemic stroke in young adults is a markedly heterogeneous disease. Although advances have been made in understanding the pathophysiology of its underlying conditions, treatments remain controversial. We describe the case of a young woman with acute ischemic stroke due to carotid artery acute thrombosis.

Methods: A 49-year-old woman was referred to our Unit by the Stroke-Unit with right hemiparesis and aphasia caused by severe homogeneous thrombus of the left internal carotid artery (ICA) showed by duplex ultrasound exami-

nation. Medical history was positive for mild congenital pulmonary valve stenosis and 20 years long oral estrogenic contraceptives assumption. Cerebral CT-scan revealed left fronto-parietal hypodense areas compatible with sub-acute ischemic lesions. Urgent revascularization was offered in order to remove the almost occlusive thrombus and restore vessel patency. Surgery was performed under general anaesthesia and consisted in thrombectomy of the internal carotid artery and angioplasty of the carotid bifurcation with an ePTFE graft. No evidence of atherosclerotic plaque or ulceration was found. Histological examination of the thrombus was requested. Postoperatively patient underwent neurological evaluations, cerebral CT-scan, angiography of the supraortic trunk, thoracic and abdomen CT-scan, echocardiography, serological examination for eventual detection of neoplastic markers and haematological disorders.

Results: The above mentioned instrumental examinations did not identify any of the most frequent lesions related to acute carotid occlusion although haematological studies have to be completed. A good and fast improvement of the neurological status was observed after surgery and patient was transferred to the Neurological Unit and underwent rehabilitation therapy.

Conclusions: Ischemic stroke is not rare in young adults. Etiology is variable and in most cases can be identified. The improvement of the neurological status suggests that even if the acute stroke was correctly diagnosed and treated, the next difficult step consists in the identification of the precise cause of the acute carotid thrombosis which is still considered antidiopathic event.

V6-9

CASE REPORT: A CASE OF PARAGANGLIOMA WITH TINNITUS AND CAROTID-JUGULAR ARTEROVENOUS FISTULA

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Istituto Clinico Mater Domini Castellanza, Italy

Objectives: We report a case of a paraganglioma of the right carotid artery, with some aspects suggestive for carotid jugular fistula and skull erosion of the posterior jugular foramen.

Methods: The patient was a 65-year-old lady concerned about a pulsatile tinnitus at the right ear, and presented to our observation with an US scan suggestive for a cervical mass of 28 mm. The treatment was surgical excision. The operative time was 1 h and 40. Blood loss was <150 cc, and no transfusion was needed during operation and perioperative period. The patient was discharged three days after surgery without any local or systemic complications.

Results: It was histologically confirmed that the carotid body tumor was completely removed and was a paraganglioma. No thrombus in jugular vein was visualized during operation or after the CT-scan performed at two months. The carotid jugular fistula image shown at the pre operative angiogram was not confirmed during surgery.

Conclusions: Numerous cases of paragangliomas were previously described in literature but the peculiarity of this case resides in the high vascularization of the tumor which provides false images at CT-scan and at angiography. This hypervascularization did not cause any difficulties during surgery because it was almost provided by minor vessels of the external carotid artery.

V6-10

A FACE AND NECK VEIN MALFORMATION DUE TO A DYSPLASTIC EXTERNAL JUGULAR VEIN

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Objectives: Vascular anomalies can be difficult to diagnose and treat. The differential diagnosis between hemangiomas and vascular malformations is based on endothelial cell characteristics. Venous malformations (VMs) are non-proliferative lesions representing errors in vascular development.

Methods: We describe a 35 years female suffering from an extended venous dysplasia (left face, eye, ear, lip, tongue, oral cavity, left neck till the level of supraclavicular region). The lesion (abnormal external jugular vein that consisted of dysplastic venous channels with multiple communications with internal jugular, subclavian and anonymous veins) was treated with preoperative sclerotherapy and surgical excision. Therapeutic results were monitored with ultrasonographic re-evaluation four weeks post sclerotherapy. Fifteen sclerotherapy courses (sodium tetracycl sulphate 3%) under anticoagulant prophylaxis in a 30 month period reduced the dimensions

of the lesion. The remaining central vascular space (7×9 cm) in the left neck was excised successfully - under full anticoagulation - under general anesthesia with a hemicelebration incision. Functional and cosmetic outcome was excellent.

Results: One must be able to distinguish hemangiomas (endothelial cell hyperplasia and proliferation) from various vascular malformations, (normal endothelial cell cycle) as well as appreciate their dynamic course with time. Diagnosis based on the initial biopsy of the lesion that showed normal endothelial cell line was vein dysplasia. Vascular malformations may be associated with underlying disease or systemic anomalies. In the presented case M.R.I., M.R.A. D.S.A., Venography and Ultrasound did not reveal any systemic

anomaly. Of all vascular anomalies, venous malformations are the most common, and despite they have a propensity for the head and neck particularly those arising from the wall of the external jugular vein are rare. The external jugular vein drains the area of the face and neck. Any condition increasing face flushing such as coughing, emotional stress, loud speaking or crying may lead to swelling and expansion of the lesion. The psychological and cosmetic discomfort is considerable.

Conclusions: Vascular malformations remain misclassified entities and a therapeutic challenge for the vascular surgeon. Thorough diagnostic work-up is required to evaluate these lesions. Therapy encompasses adverse effects such as recurrence, necrosis, embolic events.

April 26th, 2008 3rd Congress Day
14:30-16:00
11th Cardiac Scientific Session - Cardiac Research

C11-1

HUMAN ADULT SKELETAL MUSCLE STEM CELLS DIFFERENTIATE INTO CARDIOMYOCYTE AND IMPROVE LV FUNCTION IN AN ISCHEMIC INJURY MODEL

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Objectives: Myocardial regeneration either in the experimental setting or phase-I clinical trials has been mainly focused on bone-marrow derived or embryonic stem cells. Following our previous observations, we investigated the capability of multipotent progenitor cells in human adult skeletal muscle to differentiate into cardiomyocytes.

Methods: Samples of brachioradialis and paravertebral muscle were harvested from 35 and 23 patients, respectively. Following enzymatic digestion (Trypsin-EDTA), cells were cultured in a medium optimized for skeletal-muscle stem cells (SkMSC). Retinoic acid (RA) was used to differentiate such cells toward the cardiomyogenic lineage. RT-PCR was performed to detect cardiac-specific gene transcription (alfa-actinin, NPPA, Tn-I). Calcium-fluorescence detection (FLUO-3AM) was performed to assay spontaneous calcium transients. Then, co-culture with mouse cardiomyocytes was performed in order to assess the ability of RA-treated SkMSC to integrate and form gap junctions (Connexin43-immunolabeling) into a differentiated myocardial tissue. The capability of stem cells to engraft into an ischemic environment (ligation of LAD) was assessed in a murine model with injection in an area bordering the myocardial infarction (MI) of not-RA-treated SkMSC (Group1) and RA-treated SkMSC (Group2) in 21 and 13 animals, respectively. Haemodynamic parameters [heart rate (HR), peak LV-systolic pressure (LVSP), maximal rate of LV-pressure rise (dP/dTmax), minimal rate of LV pressure fall, (dP/dTmin)] were measured at five weeks. Finally, gene expression of transplanted cells was evaluated by means of RT-PCR and immunoistochemistry.

Results: Brachioradialis muscle was a better source of SkMSC than paravertebral muscle (200.000±10.000 cells/ml vs. 80.000±3.000 cells/ml). RA-treated SkMSC expressed cardiomyocyte markers (ANP 98±0.7%, cardiotin 95±0.4%, TnI 93±0.6%, alfa-actinin 92±0.8%) and acquired spontaneous contraction. Functional assays exhibited cardiac-like response to increased extracellular calcium. When cocultured with mouse cardiomyocytes, RA-treated SkMSC expressed Connexin43 and when transplanted into the ischemic heart were detectable even five weeks after injection. Measurement of hemodynamic parameters showed improved cardiac function in mice treated with RA-SkSMC with a lower heart rate (HR G1 vs. G2: 390.6±25.6 vs. 335.2±16.2 P<0.05) and an higher maximal LV pressure rise (dP/dTmax mmHg/s G1 vs. G2 3000±292 vs. 3536±760 P<0.05). RT-PCR of RA-treated SkMSC from explanted hearts showed the typical cardiomyocyte gene expression with alfa-actinin (24.7%), ANP (18.7%) and Tn-I (20.05%).

Conclusions: Brachioradialis muscle is a viable source for SkMSC: Human adult SkMSC treated with retinoic acid transdifferentiate into cells of cardiac lineage. When cocultured with murine cardiomyocytes RA-SkMSC express Connexin43 at contact points with host cells. Once injected into infarcted heart these cells integrate and survive in cardiac tissue. Transplantation of RA-treated SkSMC in MI border zone of mouse hearts improve haemodynamics and cardiac function.

C11-2

PREVENTION OF RETROSTERNAL ADHESION FORMATION IN A RABBIT MODEL USING DEXTRAN SOLUTION

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Objectives: Pericardial adhesions pose a major problem during reoperative cardiac surgical procedures. The purpose of this study was to determine the effect of intrapericardial dextran 40 on the formation of pericardial adhesions in a rabbit model.

Methods: Eighteen New Zealand White rabbits were divided into two groups (n=9): Retrosternal adhesion group (sham, group 1) and retrosternal adhesion- dextran group (treatment, group 2). Retrosternal adhesions were generated by sternotomy, pericardiotomy, and abrasion of the anterior epicardium. Before closure of the sternum, no adjuvant solution was used in group 1 and pericardium and heart were coated with dextran 40 solution in group 2. At three weeks, animals were killed and anterior chest wall with heart was removed from the body. Adhesion scores of the retrosternal field and anterior surface of the heart were done. Epicardium/myocardium tissue samples were collected for histopathological examination with both Hematoxylin-Eosin staining and immunostaining.

Results: The adhesion formation score was significantly decreased in the treatment group (group 2) compared to the untreated sham group (group 1) (P<0.05 vs. sham). The histological evaluation with immunostaining showed that, dextran 40 significantly decreased (P<0.05 vs. sham) the immunoreactivity of ICAM-1. Hematoxylin-Eosin staining showed that dextran 40 attenuated the epicardial/myocardial reaction associated with retrosternal adhesion.

Conclusions: The results of this study show that dextran 40 reduces retrosternal adhesion after sternotomy and pericardiotomy. Application of dextran 40 solution to the pericardial sac after cardiac surgery could reduce the technical difficulty and risk of repeat cardiac surgical procedure.

C11-3

SYSTOLIC VENTRICULAR PRESSURE DROP IN LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION: THE VOLUMETRIC PARADOX

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Objectives: Haemodynamic during in vitro aortic spontaneous-expandable stent valve placement was studied. Experimental findings showed paradoxical systolic ventricular pressure drop as aortic obstructive delivery device was positioned and stent released. Aortic regurgitation hypothesis was considered.

Methods: Our in-vitro model is based on a cardiovascular simulator with a double-valved left ventricle chamber connected to a resistance-adjustable compliant vascular loop. Ventricular and aortic pressure (piezoelectric sensor), flow rates (ultrasound sensor) are monitored continuously (sampling rate: 2000 Hz). Systolic and diastolic aortic pressure, as well as compliance, are adjusted by vascular loop clamps. Left ventricle is connected with a piston, computer-controlled volumetric pump, with adjustable stroke volume and duration. Versatility of the system allows for a large panel of physiological/pathological conditions, with control of dP/dt ratio. The system is volumetric settled, but has no self adaptive response to volume and pressure haemodynamic variations. The valve simulating system was prepared as follows: a stentless porcine aortic bioprosthesis (Cryolife International, O'Brien®, Atlanta, GA, USA) has been mounted on a silicon annulus, in a silicon tube, simulating left ventricular outflow tract and aortic root; sealed port access to the ventricle has been created for aortic valve intervention. Baseline haemodynamic parameters were set to 130 mmHg systolic, 100 mmHg diastolic aortic pressure, 60 beats/min heart rate, 2.59 l/min flow rate, 66.5 ml stroke volume and 35% of cycle systole duration. Triangular-shaped catheter-mounted obstructive device was fashioned. Device positioning results in purely obstructive or obstructive and regurgitating effect on aortic valve function. Angles to commissure alignment is position A, paradoxical alignment is position B.

Results: In position A, ventricular pressure raises (162±0.96 mmHg), and aortic pressure drop (111±0.44 mmHg), with 30.4±0.7 mmHg mean transvalvular gradient. In position B, ventricular pressure drop (124±0.51 mmHg), along aortic pressure (96±0.8 mmHg), with 14.5±0.49 mmHg gradient. Simulation of ventricular adaptive response to regurgitation (15% stroke volume increase) results in correction of ventricular pressure drop (150±2.31 mmHg) with 20±0.91 gradient.

Conclusions: Aortic regurgitation is a confounding factor in in-vitro evaluation of aortic obstruction (for instance, in aortic stent valve implantation). Adaptation of volumetric cardio-vascular simulator to aortic regurgitation during spontaneous-expandable stent valve implantation.

C11-4

RELAXIN-ENHANCED RETROGRADE SKELETAL MYOBLAST CARDIOMYOPLASTY FOR EFFECTIVE CELL ENGRAFTMENT AND MYOCARDIAL FUNCTION RECOVERYM. Bonacchi¹, C. Nanni³, D. Bani⁴, S. Zecchi-Orlandini⁴, M. Maiani¹, G. Di Lascio¹, M. Targetti¹, S. Gelsomino²¹Cardiac Surgery Department of Area Critica Medico Chirurgica University of Firenze, Italy; ²Experimental Surgery Department del Cuore e dei Vasi AOU Careggi Firenze, Italy; ³Nuclear Medicine AOU Sant Orsola Malpighi Bologna, Italy; ⁴Department of Anatomy and Istology, University of Firenze, Italy

Objectives: Cellular cardiomyoplasty (CCM) after acute myocardial infarction (AMI) has been shown to partially restore impaired heart function. However, the optimal cell type, the most appropriate cell delivery technique, and the actual need for adjuvant factors to enhance cell engraftment remain to be elucidated. The study objective is to assess, in a rat model of AMI, the effects of the association of skeletal myoblasts (SM) transplantation (using retrograde venous way to delivery) and relaxin, compared to isolated SM implantation or to relaxin administration alone in terms of cell engraftment and myocardial recovery.

Methods: In 80 male Wistar rats, AMI was induced by direct ligation of the LAD coronary artery. One month after AMI, four study groups (20 rats each) were arranged as follows: in SM Group, 2 ml containing 10 mil SMs were implanted in the AMI zone retrogradely through the cardiac magna vein; in RE Group, by implantation of an osmotic micro-pumping device, relaxin was administered systemically; in CT Group, a combination of SMs (transfected for paracrine production of relaxin) and systemic relaxin therapy was delivered; in PL Group, 2 ml of cell-free medium (placebo) were injected in the same manner as RE. All SMs were transfected with green fluorescent protein prior to myocardial implantation for postoperative detection of transplanted cells. Hemodynamic and tissue metabolism evaluation were performed as follows: baseline echocardiography prior to AMI induction, echocardiography and PET evaluation at 1, 4, 9 and 13 weeks post-AMI, respectively. Histology was performed in all animals after sacrifice for thorough myocardial structural assessment.

Results: At 1 month post-AMI, echocardiography showed no difference among the different groups in terms of LVEF, LVEDD, LVESD, SF and MPI, demonstrating in all cases a severe left ventricular dysfunction as compared to baseline values. The PET data (vitality volumes) were also similar among all groups. At 4, 9 and 13 weeks after cell transplantation, echocardiography showed significant improvement of all LV parameters in all treated animals ($P<0.05$) as compared to the PL group. PET detected a significant increase in myocardium viability ($P<0.05$) in SM and CT groups, but no change in RE and PL groups. In CT group, all echocardiographic and PET data showed a further significant improvement ($P<0.001$) vs. the other groups. Histological analysis showed that SMs selectively engrafted into the myocardial scar, particularly around blood vessels which showed an activated endothelium. Either RE or CT group showed extracellular matrix remodeling and angiogenesis at the AMI zone, and in CT group displayed greater efficacy of scar engraftment as compared to SM group.

Conclusions: The present data indicate that retrograde SM delivery may provide an effective strategy for CCM into scar myocardial areas. The combination of SMs with relaxin appears more favourable for tissue engraftment than isolated cell implantation, most likely for enhanced tissue angiogenesis. Further studies are required to identify the exact mechanisms underlying this synergy and to allow full exploitation of its therapeutic potential for clinical CCM.

C11-5

CARDIOSPHERES AND TISSUE ENGINEERING FOR MYOCARDIAL REGENERATION: POTENTIAL FOR CLINICAL APPLICATIONG. Pugliese¹, L. Muzzi¹, J.C. Chachques², I. Chimenti³, M. Ricci¹, A. Giacomello³, E. Messina³, G. Frati¹¹University of Rome Sapienza, Cardiac Surgery Unit, Polo Pontino, Italy; ²European Hospital G Pompidou, University of Paris V, France; ³Department of Experimental Medicine, University of Rome, Sapienza, Italy

Objectives: Cell transplantation into the damaged myocardium for regeneration has received extensive attention. The accumulated evidence from both pre-clinical/clinical studies suggests that it has the potential to restore heart function. These results evidence the need to improve the survival, the engraftment and the differentiation of the transplanted cells. Tissue engineering (TE) involves seeding a biodegradable scaffold with cells that grows into morphologically recognizable tissue both in vitro and in vivo.

The optimal biomaterials and cell types, however, have not been identified. The improvement of the protocols for the Cardiac Stem Cells (CSCs) ex vivo expansion/differentiation, coupled with the application of the bio-scaffolds, will make autologous celluoplasty closer to the clinical translation. Our hypothesis is that autologous CSCs (isolated as Cadiospheres with the method established in our lab) in combination with the optimal biodegradable biomaterials, can be used to construct tissue-engineered cardiac patches which will be viable, differentiate and can save the survival and growth potential of the embedded cells.

Methods: Preliminary data obtained in our lab show that both CSCs and CDCs can growth within and populate the type I collagen matrix in use for tissue engineering. A model of myocardial infarction has been created in mice by a left lateral thoracotomy. The left anterior descending (LAD) has been proximally ligated on beating heart, in order to create a clearly visible cyanotic area of segmental myocardial ischemia. The microtissue was applied to the surface of the epicardium of the ischemic area and fixed with two absorbable sutures. The control group underwent only LAD ligation. Cardiac morphology and ejection fraction have been assessed by echocardiography (Visualsonics VeVo 770 echocardiographic apparatus specifically designed for small animals, equipped with a 40 MHz probe).

Results: Operative mortality was 12.5%. At postoperative day 45, the group treated with CSCs microtissue showed significantly lower end-diastolic volume ($60.72\pm 6.67 \mu\text{l}$) than control group ($91.52\pm 5.59 \mu\text{l}$). Improvements in EF were observed in the treated group (35.74 ± 5.23). In contrast, EF deteriorated in the sham group (21.56 ± 3.0). LV wall thickness values measured at the level of the infarcted areas showed a thickened ventricular wall in treated group. Histology showed fragments of the cellularized collagen matrix thickening and protecting the infarct scars.

Conclusions: In infarcted mouse hearts, cell seeded matrix transplantation prevents myocardial wall thinning and limits posts ischemic remodeling. The association of the matrix seeded with CSCs seems to be the most efficient approach to reduce posts ischemic ventricular dilation and remodeling. This tissue engineered approach seems to improve the efficiency of cellular cardiomyoplasty becoming histologically like a 'bioartificial myocardium' and could emerge as a new therapeutic tool for the prevention of adverse remodeling and progressive heart failure.

C11-6

COMPARISON OF TUBULAR AND MOLDED AORTIC VALVE PROSTHESES WITH SINGLE POINT ATTACHED COMMISSURES: A DYNAMIC SIMULATIONF. Xiong¹, W.A. Goetz², K.H. Lim¹, Y.L. Chua³, J.H. Yeo¹Nanyang Technological University, Singapore; ²National Heart Center of Singapore, Singapore; ³German Heart Center Munich, Germany

Objectives: Recent development in aortic valve prosthesis design includes the truly stentless pericardial aortic valve prosthesis having the leaflets connected to the sino-tubular junction at three Single Point Attached Commissures. The leaflet geometry of this valve prosthesis can be constructed from a simple tubular structure or from a specially designed three-dimensional valve mold that mimics natural aortic leaflet geometry. This study aims to compare these two valve leaflet structures.

Methods: Two shell models of a tubular and a molded valve with three Single Point Attached Commissures were constructed. The two models had different leaflet shape, free edge length and surface area, but the same diameters of 25 mm at the aortic root and the sinotubular junction, the same commissural attachment length of 2 mm and the same material properties. Time-varying physiological pressure loadings were applied on the upper and lower aortic root wall and pressure difference between the aorta and left ventricle was applied on the leaflets over two cardiac cycles. Both valve designs were compared in terms of dynamic leaflet deformation, leaflet stress distribution and contact properties, using dynamic finite element method.

Results: The compliant nature of the aortic root was evidenced in both models, showing the maximum radial expansion of 14.8% at peak systole. This compliance was found to affect significantly the opening and closing geometry and the dynamics of the leaflets. Computed Von Mises stress indicated relatively higher magnitudes at the commissures and along the leaflet base. The highest stress value in the molded valve leaflet was 16.6% lower than in the tubular valve, while the coaptation area in the molded valve was 62.0% greater than in the tubular valve. The coaptation lines of the molded valve leaflets were curved at the fully-closed position, as seen in natural aortic valves, while the tubular valve leaflets were characterized by straight coaptation lines.

Conclusions: The molded valve prosthesis geometry with three Single Point Attached Commissures exerts a positive influence on leaflet stress distribution and coaptation in comparison to the tubular geometry, which is expected to improve valve performance and long-term durability. This dynamic finite element model can be used to modify parameters of valve prostheses towards an optimal design to minimize stress concentration and enhance valve competence.

C11-7

METABOLIC CHANGES IN SKELETAL MUSCLE DURING OFF-PUMP VERSUS ON-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY: THE MICRODIALYSIS STUDY

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Objectives: Coronary artery bypass grafting surgery with the use of the cardiopulmonary bypass (CPB) or without the CPB is associated with dynamic changes of blood circulation and peripheral blood flow redistribution. The aim of this study was to monitor and compare metabolic changes in the skeletal muscle during coronary artery bypass grafting surgery with and without cardiopulmonary bypass (CPB) by means of interstitial microdialysis. Glucose, lactate, pyruvate and glycerol were assessed as markers of basic metabolism and tissue perfusion.

Methods: Forty patients undergoing surgical myocardial revascularization were enrolled in this study. Twenty patients were operated on without CPB (group A, off-pump) and 20 patients using normothermic CPB (group B, on-pump). Interstitial microdialysis was performed by a CMA 60 (CMA/Microdialysis AB, Sweden) probe inserted into the patients left deltoid muscle. Microdialysis measurements were performed at 30 min intervals. Glucose, lactate, pyruvate and glycerol were measured in samples using a CMA 600 analyser (CMA/Microdialysis AB, Sweden). Results in both groups were statistically processed and the groups were compared.

Results: Both groups were similar with regards to preoperative characteristics. There were no significant differences in dialysate concentrations of glucose and lactate between the groups. Significant differences were detected in pyruvate concentrations, lactate-pyruvate ratio and glycerol concentrations between off-pump vs. on-pump patients. Pyruvate concentrations were higher in the off-pump group ($P < 0.01$), the lactate-pyruvate ratios indicating the aerobic/anaerobic metabolism status were lower in the off-pump group ($P < 0.001$) and the values of the concentrations of glycerol were lower in the off-pump group ($P < 0.001$). However, between-group comparisons of changes related to individual baselines revealed significant differences only for pyruvate ($P < 0.01$) and lactate-pyruvate ratio ($P < 0.01$).

Conclusions: Dynamic changes in the interstitial concentrations of the glucose, glycerol, pyruvate and lactate were found in both groups of patients (off-pump and on-pump). The presented preliminary results suggest that extracorporeal circulation during cardiac operations could compromise skeletal muscle energy metabolism. This study continues and is supported by Grant No. 8944-3 of the IGA of the Ministry of Health of Czech Republic and by Research Project MZO 00179906.

C11-8

IMPROVEMENT IN CEREBRAL NEURONAL METABOLISM WITH OFF-PUMP CARDIAC SURGERY AS DETECTED BY MAGNETIC RESONANCE SPECTROSCOPY

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Objectives: Cerebral injury, in both its overt and subtle forms, is common after cardiac surgery. Proton magnetic resonance spectroscopy allows in-vivo assessment of cerebral metabolism. N-acetyl aspartate (NAA) is a marker of neuroaxonal integrity and its levels are reduced with neuronal injury or loss. We estimated the perioperative change in cerebral N-acetyl aspartate in patients undergoing on-pump and off-pump cardiac surgery.

Methods: Magnetic resonance spectroscopy of the brain was performed preoperatively and 34 days postoperatively in 20 patients undergoing cardiac surgery: 10 having off-pump CABG and 10 having surgery with cardiopulmonary bypass (five on-pump CABG and five aortic valve replacement). Relative and absolute N-acetyl aspartate levels were measured in the frontal white matter. All patients also underwent intraoperative transcranial Doppler monitoring to assess the number of gas and solid microemboli.

Results: The median (IQR) number of microemboli was higher in the on-pump group [369 (174-861) vs. 48 (27-86), $P < 0.01$]. N-acetyl aspartate concentration relative to creatine demonstrated no significant differences between pre- and postoperative values in the two patient groups. Absolute concentrations of N-acetyl aspartate, however, demonstrated a significant increase in the off-pump group postoperatively (percent increase 26%; 95% confidence interval (CI): 1-50% vs. 7%; 95% CI:-12-34%). There was no correlation between perioperative NAA change and the number of microemboli.

Conclusions: This was an exploratory study examining the potential role of MRS in patients undergoing cardiac surgery. Reassuringly it showed overall preservation in N-acetyl aspartate level in patients undergoing on-pump and off-pump surgery. Postoperative N-acetyl aspartate concentration is significantly increased in patients undergoing off-pump surgery indicating possible improvement in cerebral metabolic function. Magnetic resonance spectroscopy provides an objective assessment of cerebral metabolites which may prove to be surrogate markers of perioperative cerebral injury.

C11-9

IMPROVING CARDIAC FUNCTION AND ANGIOGENESIS THROUGH MESENCHYMAL STEM CELL IN ACUTE MYOCARDIAL INFARCTION (MI) INDUCED IN SHEEP ANIMAL MODEL

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Objectives: Heart failure is a major cardiovascular health problem worldwide. Loss of cardiomyocytes after myocardial infarction (MI) is a causative factor in progression to heart failure because adult cardiomyocytes have essentially less regenerative capacity. Recently, particular interest has developed for the use of mesenchymal stem cells (MSCs) for regenerating damaged heart. In the current study, using a sheep model of myocardial infarction we sought to assess the effect of MSC transplantation into infarcted myocardium. With the aim to clearly define the mechanism of MSC action on myocardium we looked into neovascularization and cardiac function.

Methods: Bone marrow was collected under regional anesthesia through aspiration from the iliac crests of sheep. The aspirates were aseptically transferred into sterile heparinized phosphate-buffered saline (PBS) and processed within 1-3 h. Then the mononuclear cells (MNCs) were collected. Total expanded cells for transplantation were $27 \pm 2 \times 10^6$. In 12 female sheep after general anesthesia and left thoracotomy, the second diagonal branch of left anterior descending coronary artery (LAD) was ligated using 6-0 Prolene suture at a point approximately 40% distant from its base. In six sheep mesenchymal stem cells were injected into the mid and border zone of infarcted area. Cardiac function was evaluated preoperatively as well as on the 1st day and two months post-operation using trans-thoracic echocardiography. After two months all animals were sacrificed and the hearts fixed in formaldehyde for pathology and immunohistochemistry (IHC). In IHC, all slides were stained with vWF and SMA (smooth muscle actin) antibodies for counting the capillaries and small arteries both in the infarcted area and border zone.

Results: In echocardiography ejection-fraction (EF) increased in study group than control. Counting of small arteries and capillaries in the immunohistochemical slides showed significant increase in stem cell group than control. Also ejection fraction and cardiac function improved in stem cell group.

Conclusions: In this study we demonstrate improvement of cardiac function with cell therapy through angiogenesis. We believe that angiogenesis could prevent cell death and cardiac damage after acute MI. Acute blood loss of myocardium after MI can be attenuated with immediate stem cell transplantation.

April 26th, 2008 3rd Congress Day
14:30-16:00
12th Cardiac Scientific Session - Arrhythmia

C12-1

SURGICAL TREATMENT OF LONE ATRIAL FIBRILLATION: CLINICAL RESULTS AND ECHOCARDIOGRAPHIC EVALUATION OF ATRIAL FUNCTION FOLLOWING ABLATION

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Objectives: Minimally invasive surgical treatment of lone atrial fibrillation (AF) is steadily gaining popularity in the past few years thanks to its encouraging preliminary results, albeit the atrial performance following ablation in this specific subset of patients has not been widely investigated so far.

Methods: Thirty-five patients with lone AF refractory to medical treatment and/or previous failed percutaneous approaches were scheduled for closed-chest surgical ablation. Via a monolateral or bilateral closed-chest, endoscopic approach the right pleural space was entered, the pericardial cavity opened and a continuous linear epicardial encircling of the pulmonary veins performed using a microwave (Flex 10, Guidant, Fresno, USA) or unipolar radiofrequency (Cobra Adhere Excel, Esteche, San Ramon, USA) endoscopic probe. In patients receiving high-thoracic epidural anesthesia, a catheter was placed at the level of T1-T2 and a solution of ropivacaine and sufentanyl was administered. At follow-up, echocardiographic evaluation of the atrial function was performed by means of the analysis of the E/A waves ratio and deceleration time (Dt).

Results: All procedures were successfully performed in all patients, either with general anesthesia (13 patients) or with high-thoracic epidural anesthesia (22 patients). In 14 patients of the epidural group, consciousness and spontaneous breathing was maintained throughout the operation and no conversion to endotracheal intubation or general anesthesia was required. In patients receiving endotracheal intubation (either with general anesthesia or with high-thoracic epidural analgesia) extubation was carried out in all cases in the OR. There was no need for ICU stay nor any postoperative complications occurred among any patients. Patients were discharged after 3.2±2.5 days. At a mean follow-up of 670 days (range 230-1233 days), 30/35 patients (85.8%) are in sinus rhythm. In 19 patients, an echocardiographic study was performed after 779±283 days following ablation; in 17/19 sinus rhythm was detected. Mean EF increased from 56.9% (pre-op) to 62.5% (post-op). Mean left atrial diameter decreased from 47 mm (pre-op) to 42.8 mm (post-op); mean E/A waves ratio was 1.15 and mean Dt 216 ms. In the right atrium, mean E/A waves ratio was 1.17 and mean Dt was 204 ms.

Conclusions: Total endoscopic epicardial pulmonary veins isolation proved to be a feasible and effective technique for the treatment of AF, with a considerable high rate of success at mid-term. Following ablation, in patients with sinus rhythm it is possible to observe the recovery of a normal atrial function, albeit further data are warranted to confirm our preliminary results.

C12-2

COMBINED OFF-PUMP EPICARDIAL BIPOLAR RADIOFREQUENCY ABLATION AND OFF-PUMP CORONARY ARTERY BYPASS GRAFTING (OPCAB) FOR ISCHEMIC HEART DISEASE AND ATRIAL FIBRILLATION

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Objectives: The treatment of non-mitral atrial fibrillation is not well documented. What is more, the interest in the off-pump techniques in cardiac surgery has been raising significantly during recent years. We evaluated the combined off-pump treatment of the nonmitral atrial fibrillation and coronary artery disease using off-pump coronary artery bypass grafting (OPCAB) and pulmonary vein isolation using irrigated bipolar radiofrequency system.

Methods: Between December 2003 and July 2007, 47 patients with paroxysmal atrial fibrillation underwent off-pump coronary artery bypass grafting (OPCAB) and off-pump pulmonary vein isolation using irrigated bipolar radiofrequency system. Acute conduction block was evaluated in all 47 patients. Follow-up was performed using echocardiography, 24 h or 7 day Holter ECG and anamnesis 3, 6, 12, 24 and 48 months after ablation.

Results: All patients were followed-up for at least six months (between 6 and 48 months; mean 15.4 months). Major adverse events include one patient death and one patient requiring implantation of a pacemaker. At discharge 40 of 46 patients (87%) were in stable sinus rhythm. After three months, stable sinus rhythm was found in 35 of 46 patients (76%). After 6 months, 42 of 46 patients (91%) and after 1 year 33 of 38 (87%) patients were in stable sinus rhythm. Complete conduction block was accomplished in 80 of 94 (85%) pulmonary vein pairs after a single radiofrequency ablation. In 9 of 94 pairs (10%) second application and in 4 pairs (4%) more than two applications were needed. In one patient the conduction block could not be achieved after multiple applications.

Conclusions: Pulmonary vein isolation with the use of the irrigated bipolar radiofrequency combined with off-pump coronary artery bypass grafting (OPCAB) is feasible, safe, and gains high experimental and clinical efficacy.

C12-3

SINUS RHYTHM BEFORE OPERATION DIFFERENTIATES PATIENTS DEVELOPING ATRIAL FIBRILLATION FROM THE PATIENTS THAT REMAIN IN SINUS RHYTHM AFTER CARDIAC REVASCULARIZATION

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Objectives: Advanced heart rate variability analyses applying non-linear dynamics and chaos theory and heart rate turbulence are nowadays the most powerful tools to provide information about the cardiac autonomic modulation and strongest predictors of sudden death and/or malignant arrhythmias. Our aim was to compare autonomic modulation and non-linear dynamics of the heart after beating heart coronary artery bypass grafting in the group with postoperative atrial fibrillation vs. postoperative sinus rhythm group.

Methods: Sixty-six consecutive patients, 43 men, mean age 63.5 years with isolated stable three-vessel coronary artery disease, taking β blockers chronically were scheduled for off-pump CABG. High-resolution 15-min ECG and 24-h Holter recordings were performed to assess autonomic modulation and non-linear HR dynamics by determining Heart Rate Turbulence (Turbulence Slope and Turbulence Onset, Detrended Fluctuation Analysis with short (<11 beats) and long-term (>11 beats) correlation properties of R-R intervals and Fractal dimension (High and Low) in postoperative atrial fibrillation (PostopAF, 27) vs. normal sinus rhythm (39) group preoperatively, on the third and seventh postoperative day. Statistical analyses included paired-samples *t*-test, Mann-Whitney or Fischer exact test. Results were reported as mean±S.E.; *P*<0.05 or less was considered significant.

Results: PostopAF group had preoperatively significantly lower values of Turbulence Slope: 4.091±0.696 vs. 9.079±1.648 ms/beat, *P*<0.01. Index Turbulence Slope (Preoperative Postoperative Turbulence Slope) was significantly lower in PostopAF group (*P*<0.05). One was consistently lower in PostopAF group preoperatively (1.048±0.057 vs. 1.252±0.030; *P*<0.001), on the third (0.800±0.059 vs. 1.134±0.071; *P*<0.001) and on the seventh postoperative day (0.859±0.066 vs. 1.178±0.060; *P*<0.001). Low Fractal Dimension was significantly higher in PostopAF before (1.741±0.26 vs. 1.792±0.036; *P*<0.05) and after operation (1.681±0.015 vs. 1.671±0.029; *P*<0.05).

Conclusions: Patients prone to postoperative AF after myocardial off-pump revascularization exhibit profoundly altered non-linear Heart Rate dynamics and Heart Rate Turbulence indexes already preoperatively whilst in normal sinus rhythm. Implementing the model we hope to reproducibly identify patients with highest risk of postoperative AF already before operation, extend the applications to other surgical groups and potentially decrease the occurrence of postoperative AF by the use of surgical intraoperative measures.

C12-4

SIMILAR CARDIAC AUTONOMIC REGULATION IN SINUS RHYTHM FOLLOWING SUCCESSFUL ABLATION OF PERMANENT AND PAROXYSMAL ATRIAL FIBRILLATION; WHAT CAN WE SEE ON THE LEVEL OF STRUCTURAL ELECTROPHYSIOLOGICAL SUBSTRATE OF THE HEART?

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Objectives: We showed that cardiac sympathetic and parasympathetic modulation end up in comparable levels after successful ablation irrespective of AF type. Unlike in paroxysmal electrical as well as structural remodeling occurs in permanent atrial fibrillation (AF). Advanced non-linear chaos-based methods provide additional information on dynamics of heart rhythm/rate especially in relation to heart failure and arrhythmia potential. We sought to determine fractal characteristics in both ablated paroxysmal vs. permanent group.

Methods: Twenty-six patients, electively admitted for coronary revascularization and/or mitral/aortic valve replacement and concomitant ablation for either paroxysmal (14) or permanent (12) atrial fibrillation undergone digital 24-h electrocardiographic recordings at 12 months after the procedure. The two groups were matched to have comparable demographic and clinical characteristics. Apart from conventional measures, Detrended Fluctuation Analysis with short-(11 beats) and long-term (>11 beats,) correlation properties of R-R intervals and Fractal Dimension (High and Low) were performed on the 24 h Holters using Aspel and DEKG software. Statistical analyses included paired-samples *t*-test, Mann-Whitney or Fischer exact test. Results were reported as mean±S.E.; *P*<0.05 or less was considered significant.

Results: No differences were found between paroxysmal and permanent AF group regarding demographic and clinical characteristics. Deriving 1 and 2 from Detrended Fluctuation Analysis no differences were found: 0.87±0.23 vs. 1.0±0.41; *P*=0.66 for 1 and 1.14±0.11 vs. 1.16±0.14; *P*=0.79 for 2. for permanent vs. paroxysmal AF group, respectively. Calculating Fractal Dimension, no differences were found in Fractal Dimension »High« (1.85±0.11 vs. 1.84±0.08; *P*=0.61) and Fractal Dimension »Low« (1.84±0.12 vs. 1.77±0.21; *P*=0.58) between permanent vs. paroxysmal group, respectively.

Conclusions: Conventional linear heart rate analyses and newly studied fractal dynamics show comparable sympathovagal interaction on the level of autonomic regulation of the heart (intrinsic cardiac network or higher). Evenmore, similar non-linear dynamics parameters suggest similar responses on the level of the electrophysiologic substrate. It remains to be determined to what extent the latter quantifies reverse electrical remodeling.

C12-5

THOROSCOPIC EPICARDIAL PULMONARY VEIN ISOLATION IS A REALISTIC ALTERNATIVE FOR ENDOCARDIAL RADIOFREQUENCY ABLATION: LOWER RISK OF ARTERIAL EMBOLISM

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Objectives: Pulmonary veins isolation (PVI) has become an established treatment for atrial fibrillation (AF). However, post-procedural complications by cerebroembolic events might occur. In order to evaluate the cause of these complications we compared the number of cerebral microemboli during two approaches of PVI; epicardial microwave ablation and percutaneous endocardial radiofrequency ablation in patients with AF.

Methods: Ten patients underwent a right three port mono-lateral thoracoscopic epicardial microwave ablation on the beating heart of the four pulmonary veins and the posterior left atrium (=EPI group). Twelve patients underwent endocardial RF ablation of the four pulmonary veins (=ENDO group). Transcranial Doppler was used in all patients to detect cerebral MES. **Results:** There was no significant difference in total ablation time between the two groups (EPI=29 min (±7), ENDO=22 min (±10)). Stroke or CVA was not reported in any of the patients. The average of a total of 6 (±9) cerebral MES per patient in the EPI group is significantly lower than the 2703 (±1919) cerebral MES in the ENDO group. During 1 min of ablation there is as well a significant difference between both groups: 54 cerebral MES in the ENDO group and <1 cerebral MES in the EPI group.

Conclusions: Cerebral MES were almost absent during thoracoscopic epicardial microwave ablation for the treatment of AF. This finding is in sharp contrast with the abundant MES detected during percutaneous endocardial RF ablation. Due to a positive association between the number of microembolic signals (MES) and cerebral complications, the striking difference of the amount of MES and the absence of thrombus formation might indicate a comparatively low risk of cerebrovascular complications for the epicardial approach as compared to the percutaneous approach. Since the success rates of both PVI approaches is reported to be around 80%, the absence of cerebral MES render the thoracoscopic epicardial microwave approach a realistic alternative for endocardial RF ablation.

C12-6

A NOVEL DEVICE TO DETECT ATRIAL FIBRILLATION DURING FOLLOW-UP AFTER SUCCESSFUL MAZE PROCEDURE

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Objectives: Maze procedure for atrial fibrillation (AF) is now an accepted mainstream procedure for surgical ablation. The best modality of follow-up after these procedures and the determinants of success remain to be universally established. A novel device 'AF Alarm' was developed recently to detect automatically cardiac arrhythmia.

Methods: AF was surgically ablated in 156 patients from February 2004 through November 2007. AF Alarm device was applied to detect episodes of AF at six months and more after surgery in patients who were in normal sinus rhythm in at least two follow-up visits and according to follow-up Holter data.

Results: Preoperatively 78 patients had persistent atrial fibrillation (50%), 67 suffered from permanent AF (43%) and 11 patients had paroxysmal AF (7%). Left atrial ablation was done in 111 patients and biatrial ablation in 39. Eighty four percent of patients were in sinus rhythm at follow-up. AF Alarm device was used in 12 of these patients with normal sinus rhythm according to Holter monitoring and follow-up visits without any subjective complaints of arrhythmia at six months and more after the procedure. Short episodes of AF were found in half of them.

Conclusions: Claim of success after AF ablation is often controversial. Some patients considered to be in normal sinus rhythm after ablation can still have some silent episodes of AF. AF alarm device can provide more precise estimation of procedural success. These data can influence anticoagulation and antiarrhythmic protocols after ablation.

C12-7

SURGICAL TREATMENT OF STAND-ALONE LONGLASTING PERSISTENT ATRIAL FIBRILLATION USING A MONOLATERAL THOROSCOPIC APPROACH

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Objectives: The cut-and-sew Cox Maze III has established surgical intervention as an effective therapeutic option for the treatment of atrial fibrillation. Recently less invasive off-pump procedures have been proposed as an alternative for patients with stand-alone AF. In this study, we describe outcomes (6-31 months) in patients with symptomatic stand-alone AF after undergoing epicardial microwave ablation using a monolateral right or left-sided thoracoscopic approach.

Methods: Forty-four patients with symptomatic long-lasting AF who underwent a thoracoscopic ablation procedure between January 2005 and July 2007 were studied. Mean AF duration was 101.5±70.6 months, and mean last SR was 21±25 months. Thirty-seven patients underwent a right thoracoscopic procedure. In seven patients with a documented higher risk for thrombo-embolic events, a monolateral left-sided procedure was performed to allow management of the left atrial appendage.

Results: A small left mini-thoracotomy was needed in two patients because of bleeding from the left atrial appendage stapling line. One patient in the right-sided group with sleepapnea treated with CPAP died at night during follow-up. None of the patients needed a pacemaker implantation. At three months follow-up 13 patients had SR, seven patients had paroxysmal AF and 22 patients were cardioverted. All patients had a six day Holter monitoring at six months. Twenty-five patients had SR, nine patients had PAF with a low AF burden, and ten patients remained with persistent AF. All patients who changed to SR or paroxysmal AF had a significant improvement in QOL.

There was no significant difference in conversion rate between the right and left-sided approach.

Conclusions: A monolateral thoracoscopic epicardial microwave isolation of the pulmonary veins in patients with long lasting persistent AF is a feasible technique with encouraging intermediate term results. In patients with an increased risk for thrombo-embolic events, a monolateral left approach can be performed to allow exclusion of the left atrial appendage.

C12-8

MINIMALLY INVASIVE VIDEO-ASSISTED OFF-PUMP PULMONARY VEIN ISOLATION FOR ATRIAL FIBRILLATION USING BIPOLAR RADIOFREQUENCY ABLATION

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Objectives: Atrial fibrillation (AF) is the most common arrhythmia, having a strong impact on long-term stroke and heart failure prevalence and mortality. Nowadays, rapid development in the field of minimising the invasiveness of surgical ablation of AF can be observed. To report on the feasibility and early results of the experience with a novel technique of minimally invasive video-assisted beating heart bilateral surgical ablation for lone paroxysmal AF using irrigated bipolar radiofrequency technique.

Methods: Between February 2006 and January 2008, 22 patients with highly symptomatic paroxysmal AF, resistant to pharmacological treatment, underwent video-assisted beating heart bilateral pulmonary vein isolation using irrigated bipolar radiofrequency combined with vein of Marshall dissection and left atrial appendage closure. Acute conduction block assessment was performed in all patients. In eight patients up to five unsuccessful percutaneous ablations had previously been performed.

Results: There were no intraoperative complications. One TIA and one pneumonia were observed in the early postoperative course. Ablation time was on average 92±14.1 s. At least one recurrence of AF was observed in 15 patients in the early postoperative period; in 12 of them an electrical cardioversion was performed. All patients were discharged home in stable sinus rhythm. Follow-up was performed using echocardiography, 24-h or 7-day Holter monitoring and anamnesis three times a year. Eighteen patients have exceeded six months observation and eight patients 12 months of observation. Persistent AF is observed in one patient and an onset of paroxysmal AF was observed in one patient one year after ablation.

Conclusions: Minimally invasive video-assisted beating heart bilateral surgical ablation for lone paroxysmal AF using irrigated bipolar radiofrequency is effective and safe. These promising results have to be confirmed by larger studies.

C12-9

ATRIAL FIBRILLATION AS AN INDEPENDENT PREDICTOR OF DELIRIUM AND STROKE AFTER CARDIAC SURGERY: A PRELIMINARY RESULT FROM CODACS STUDY

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Objectives: Preoperative atrial fibrillation significantly increases the risk of cardiac surgery and the occurrence of postoperative complications. The aim of our study was to evaluate the direct influence of preoperative atrial fibrillation on postoperative delirium, complications, including stroke, and prognosis of patients subjected to cardiac surgery.

Methods: The presented research is a subanalysis of a preliminary report of CODACS trial (Consciousness Disorders After Cardiac Surgery). A total of 260 patients admitted for open-heart surgery were prospectively included in the study. They were preoperatively examined with the use of the Mini-Mental State Examination Test and the Mini International Neuropsychiatric Interview. Altogether 45 pre-, intra-, and postoperative variables were also analyzed. Preoperative AF was diagnosed on the basis of multiple electrocardiographic examinations and confirmed by 24 h Holter monitoring. Diagnosis of delirium following surgical intervention was based on the DSM-IV criteria.

Results: Delirium was diagnosed in 30 of the 260 patients (11.54%). Preoperative atrial fibrillation was diagnosed in 23 patients (8.8%), in 15 patients in the

non-delirious group (7%) and eight (27.0%) in the delirious group. We showed that preoperative atrial fibrillation was an independent predictor of postoperative delirium ($P<0.001$), increasing the risk of delirium occurrence over sevenfold ($OR=7.2$). AF also increased the risk of postoperative complications such as stroke ($OR=1.99$; 8.7% vs. 1.3%, respectively, $P<0.001$), postoperative supraventricular arrhythmia (AF: 78.3% vs. 22.8%, respectively, $P<0.001$) and low output syndrome (21.7% vs. 17.3%, respectively, $P=0.033$). Preoperative AF significantly prolonged the duration in Intensive Care Unit (4.2 ± 2.9 vs. 2.8 ± 2.1 days, $P<0.001$) and hospitalization stay (15.9 ± 7.2 vs. 11.1 ± 5.5 , $P<0.001$) and worsened the prognosis, significantly increasing the risk of death (8.7% vs. 0.8%; $P<0.001$).

Conclusions: Preoperative AF was an independent risk factor of postoperative delirium, ($OR=7.2$). Preoperative AF was also associated with significantly worse postoperative outcome (supraventricular arrhythmia, stroke, low output syndrome and risk of death). These results, and data from available studies, suggest that preoperative AF should be considered as an important predictor of postoperative outcome. This problem should be the subject of future research to establish beneficial treatment options.

April 26th, 2008 3rd Congress Day

14:30-16:00

13th Cardiac Scientific Session - Mitral Valve

C13-1

RESULTS OF MITRAL VALVE REPAIR VS. MITRAL VALVE REPLACEMENT FOR ISOLATED ACTIVE INFECTIVE MITRAL VALVE ENDOCARDITIS: 20-YEAR SINGLE CENTER EXPERIENCE

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Objectives: We retrospectively compared early and long-term results of mitral valve repair (MVRep) and mitral valve replacement (MVR) in patients with isolated infective mitral valve endocarditis (MVE).

Methods: Between April 1986 and December 2006, 1143 infective endocarditis operations were performed including 470 infected mitral valves. Fifty-nine of these patients (39 men, median 49 years) received MVRep with pericardium and 194 MVR (124 men, median 57 years) due to isolated MVE. Probability of survival, freedom from recurrence and reoperation were calculated using Kaplan-Meier and χ^2 -test to identify predictors. Follow-up (3 months 19.6 years) was completed in all survivors with 306 and 719 patients years in the MVRep and MVR group.

Results: Compared to the MVRep group, MVR patients were significantly older, preoperatively significantly more often intubated, in cardiac decompensation and more often underwent emergency operation. MVRep patients had significantly more preoperative septic cerebral embolism. MVRep was associated with significantly better survival than MVR: 30-day, 1, 5, 10 and 15 year survival rate was $91.4\pm 3.6\%$, $84.0\pm 5.0\%$, $76.6\pm 6.1\%$, $62.4\pm 8.2\%$ and $62.4\pm 8.2\%$ compared to $80.1\pm 2.9\%$, $66.4\pm 3.5\%$, $52.8\pm 3.9\%$, $39.8\pm 4.5\%$ and $36.9\pm 5.0\%$ ($P=0.0050$). Freedom from MV reoperation due to failure of reconstruction at 1, 5 and 10 years was $86.6\pm 5.0\%$, $84.4\pm 5.4\%$, and $79.1\pm 7.2\%$. Early re-endocarditis occurred in 2/59 (3.3%) after MVRep and 5/194 (2.5%) after MVR.

Conclusions: MVRep for MVE shows much better early and long-term survival than MVR. It should be performed when all infected material can be resected and the remaining tissue allows re-shaping of a competent valve. Patients requiring MVR had advanced endocarditis with annular destruction and were more critically ill.

C13-2

SIZING IN MITRAL REPLACEMENT FOR CHRONIC MITRAL REGURGITATION ACCORDING TO INTERTRIGONAL SIZE

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Objectives: In surgery for chronic mitral regurgitation (CMR) the best results are obtained by mitral repair through subvalvular preservation and mitral annulus reduction. Most surgeons prefer to undersize the mitral ring device.

But on the contrary, they choose the biggest prosthesis possible for mitral replacement (MR).

Methods: In the last 5.5 years, 40 MR for CMR were performed, 17 of those had a mitral prosthesis size according to the inter-trigonal size (measured by standard Carpentier ring seizer holders) minus 3 (ex.: for a theoretical Carpentier ring device size 28 we use a prosthesis size 25): GI, operated by 1st author and 23 for standard prosthesis measure, GII, operated by the remaining. An observational non-randomized study comparing GI vs. GII was performed. In all cases posterior leaflet was preserved. Fisher's exact test was applied.

Results: There were one case in GI and three in GII of Hospital mortality ($P=NS$). Regarding the low cardiac output at ICU: non-amines needed: 7 cases in GI and none in GII, $P<0.005$; low dose amines needed: ten cases in GI and 17 in GII, $P=NS$; high dose amines needed: none in GI and 6 in GII, $P<0.05$; IABP needed: none in GI and 3 in GII, $P=NS$. ICU stay: 3.7 days in GI and 9.1 days in GII, $P<0.01$. At the follow-up, a non-stenotic prosthesis were found by echo.

Conclusions: In MR for CMR it might be recommendable to use undersized mitral prosthesis according to inter-trigonal size, due to perform a best ventricular remodelling secondary to reduction of the mitral annulus. A prospective randomised study must be done.

C13-3

OUTCOME OF TRICUSPID VALVE ANNULOPLASTY IN PATIENTS WITH UNEXPECTED INTRAOPERATIVE SEVERE TRICUSPID REGURGITATION

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Objectives: To determine the short-term outcome in patients who undergo tricuspid valve annuloplasty for previously unknown severe tricuspid regurgitation recognized intra-operatively during other cardiac surgical procedures.

Methods: An IRB approved retrospective review of 139 tricuspid valve annuloplasties performed at a single institution from 2005-2007 was conducted. The subjects were split into two groups. Group A ($n=74$), patients who preoperatively were identified as having significant tricuspid regurgitation and were scheduled for annuloplasty, were compared to Group B ($n=65$), patients who unexpectedly were found to have significant tricuspid regurgitation at the time of surgery for other cardiac conditions. The parameters compared included demographic data, pre-op comorbidity, cardiac evaluation, details of operative procedure, length of ICU stay, duration of hospitalization, development of complications and periop mortality. For quantitative variables, the t -test and the Mann-Whitney test were used. For nominal data, the χ^2 -test and the Fisher's Exact test were performed. Significance was assessed at $P<0.05$.

Results: The mean age (\pm S.E.M.) of Group A and Group B patients were 67.1 ± 1.5 and 66.9 ± 1.8 years, respectively. There was no difference in the two groups with regards to pre-op and intraop characteristics (e.g. Age, Sex, Co-morbidity, NYHA risk class, cardiac assessment by ECHO and cardiac catheterization, operation performed). Short-term results demonstrate no difference between the two groups in terms of mortality or other complications, with the exception of reoperation for bleeding (Group A vs. Group B, 0.0% vs. 6.2%). Also, a trend in favor of Group B in comparison to Group A for post-op ICU stay ($P=0.07$) and duration of ventilation ($P=0.06$) is noted.

Conclusions: Although the consequences and progression of tricuspid regurgitation after correcting primary cardiac abnormalities are variable, the finding of unexpected significant tricuspid regurgitation at the time of other cardiac surgical procedures should be aggressively sought out and repaired. Tricuspid valve annuloplasty can be done additionally with no significant increase in risk in those patients undergoing other cardiac surgical procedures.

C13-4

MASKED MITRAL VALVE DISEASE IN HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY: NOTE OF CAUTION DURING SEPTAL MYECTOMY

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Objectives: Systolic anterior motion (SAM) of the mitral valve (MV) is commonly considered causative of left ventricular outflow obstruction and mitral regurgitation in hypertrophic obstructive cardiomyopathy (HOCM). Conventional wisdom warrants that adequate relief of obstruction by trans-

aortic septal myectomy (TSM) will subsequently result in resolution of mitral regurgitation (MR), even if significant.

Methods: Twenty consecutive patients with HOCM and preoperative significant MR underwent TSM between January 2004 and November 2007. In five patients among them MR remained significant despite effective TSM. Intraoperative TEE identified a repairable cause of the residual MR. In all five patients the MR was abolished in a second pump-run for MV repair/replacement.

Results: The additional repairable lesion could have been detected by the preoperative study in three of them. In one patient it became apparent on the preoperative TEE only in hindsight, and in one patient the significance of MR became apparent only after TSM. In two patients mitral valve replacement had to be performed in the absence of a detectable culprit lesion or due to intraoperative evidence of organic mitral valve disease unrelated to HOCM.

Conclusions: In up to 25% of the patients with HOCM and significant MR it may be difficult to predict whether abolishing SAM by TSM may also effectively abolish MR, because of: 1) intrinsic MV abnormalities typical for HOCM particularly leaflet redundancy; 2) changes in MV configuration following TSM and 3) the potential presence of coincidental organic MV disease. Therefore, the HOCM candidates for TSM should be screened for masked MV disease - not only by careful preoperative TEE, but also by off-pump intraoperative TEE following TSM.

C13-5

CLINICAL RESULTS OF MINIMALLY INVASIVE MITRAL VALVE SURGERY: ENDOCLAMP VERSUS EXTERNAL AORTIC CLAMP TECHNIQUES

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Objectives: Different surgical techniques have been proposed to perform video-assisted minimally invasive mitral valve surgery. To assess and compare efficiency and safety of these techniques a retrospective study was undertaken comparing the endoaortic clamp and the external aortic clamp technique.

Methods: Between December 2002 and January 2008, 103 patients (57 males, aged 63 ± 11 years) underwent video-assisted mitral valve surgery (MV) through a 5-8 cm right anterolateral thoracotomy. In 29 patients aortic clamping was achieved using the endoaortic clamp and cardioplegia delivered through the endoaortic clamp lumen (group A: 59% males, aged 63 ± 10 years, 66% MV repair and 34% MV replacement). In 65 patients, aortic cross clamping was achieved with an external transthoracic clamp or with an intrathoracic flexible clamp and cardioplegia delivered directly into the ascending aorta (group B: 51% males, aged 62 ± 12 years, 74% MV repair and 26% MV replacement). In nine patients the operation was achieved in presence of ventricular fibrillation and no aortic clamp was needed.

Results: In group A, three patients needed conversion to sternotomy (two for aortic dissection and one for bad exposure); two patients needed IABP after the procedure. No intraoperative procedure-associated problems or conversion to sternotomy were experienced in group B. Aortic cross-clamp time was not significant different in the two groups (121 ± 53 min in group A vs. 107 ± 23 min in group B; $P=0.11$), while cardiopulmonary bypass time was higher in group A (187 ± 66 min vs. 154 ± 41 min; $P=0.004$). No perioperative deaths were observed in both groups. Postoperative levels of myocardial cytonecrosis enzymes were lower in group B than in group A (troponine I 5.3 ± 4.7 ng/ml vs. 18 ± 32 ng/ml; $P=0.0022$). At a mean follow-up of 24 ± 17 months, 97% of patients were in NYHA class I-II, with satisfactory result at echocardiography (absent or mild residual mitral regurgitation in 92% of cases). Three patients in group A had a not-cardiac related death. Only one patient in group B needed early reoperation for mitral valve repair failure.

Conclusions: Minimally invasive mitral valve surgery seems to be an effective and safe operation. The intraoperative procedure-associated complications with endoclamping in early experience forced us to change our practice to the more simple and economic external aortic clamp technique. The endoclamp technique is still indicated in redo-minimally invasive mitral valve surgery.

C13-6

FATE OF MITRAL INSUFFICIENCY FOLLOWING ISOLATED AORTIC VALVE REPLACEMENT FOR SEVERE STENOSIS

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Objectives: Degenerative aortic stenosis (AS) is often coexistent with moderate mitral regurgitation (MR) and this poses a clinical dilemma in many patients. Our objective was to analyze the changes in mitral regurgitation following isolated aortic valve replacement and identify potential predictors for mitral insufficiency improvement.

Methods: Patients with severe aortic stenosis and significant mitral regurgitation were collected from our surgical database between May 2003-June 2007. Those with significant aortic regurgitation (grade 2+) were excluded. Preoperative and postoperative echo studies were analyzed for mitral regurgitation and morphologic study of the mitral and aortic valves, and the results compared and analyzed. MR was classified as 0-none I-trace II-mild III-moderate IV-severe.

Results: In the time frame of the study 43 patients fulfilled the criteria, and in these patients the morphological analysis of the mitral indicates that etiology was 58.1% degenerative, 6.9% rheumatic, 35% functional. Preoperative MR was grade II in 38 (88.4%) cases and grade III in 5 (11.6%). All grades IV MR were addressed at surgery, and were excluded. After AVR 18 (41.8%) had MR degree improvement and 15 (34.9%) had none or trace MR ($P<0.001$). Univariate analysis demonstrated functional etiology was associated with non-significant postoperative MR (OR 0.9-12.9). There were not any other variable associated with the outcome. In the multivariate analysis a statistically significant association was found between functional MR, low LVEF and smaller end-diastolic left ventricular diameter and the absence of significant postoperative MR as with improvement of persistent MR.

Conclusions: The non-organic grade II+ mitral insufficiency significantly improves after isolated aortic valve replacement. Functional etiology defined in the echo studies, low LVEF and small EDLV diameter could identify MR prone to improve after AVR although prospective studies are required to confirm our initial findings.

C13-7

SURGICAL MITRAL ANNULOPLASTY IN PATIENTS WITH IDIOPATHIC DILATED CARDIOMYOPATHY - ONE YEAR FOLLOW-UP

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Objectives: Surgical mitral valvuloplasty is an increasingly applied method of treatment in symptomatic patients (pts) with significant mitral regurgitation and dilated cardiomyopathy. We investigated the effects of surgical mitral or mitral and tricuspid valve repair on prognosis and quality-of-life in patients with idiopathic dilated cardiomyopathy and severe mitral regurgitation.

Methods: Twenty-seven patients (18 M, mean age 46.9±12.3 years) without coronary artery disease underwent surgical mitral valve repair. They were divided into two groups: group 1 - patients with mitral annuloplasty ($n=17$, full ring Edwards Lifescience 28-32) and group 2 patients with mitral and tricuspid annuloplasty ($n=10$: TV annuloplasty: de Vega 1 patient, full ring Edwards Lifescience 3 patients, Duran 4 patients, Medtronic 2 patients). In all the patients surgical treatment was followed by 3-week rehabilitation programme. Thirty-day and 1-year mortality as well as clinical (New York Heart Association Class, quality-of-life questionnaire) and echocardiographic variables at baseline and at mean follow-up 22.8±9.5 months were assessed.

Results: Thirty-day mortality was 3.7% and 1-year mortality 11.1%. Postoperative assessment showed reduction of NYHA functional class ($2.7±0.5$, $1.7±0.5$, $P=0.001$), pulmonary hypertension ($45±4$ vs. $35±10$ mmHg, $P=0.001$) and left atrial size (left atrial area: $36±7$ vs. $30±9$ cm², $P=0.05$) and quality of life improvement (physical functioning: $32±25$ vs. $61±22$, $P=0.004$; role physical: $27±27$ vs. $52±26$, $P=0.02$; bodily pain: $31±20$ vs. $55±21$, $P=0.001$; general health: $25±12$ vs. $45±18$, $P=0.002$; vitality: $32±21$ vs. $62±17$, $P=0.00009$; physical component summary: $33±7$ vs. $41±7$, $P=0.0001$; social functioning: $51±21$ vs. $78±20$, $P=0.0003$; role emotional: $29±28$ vs. $62±28$, $P=0.003$; mental health: $41±19$ vs. $65±15$, $P=0.003$; mental component summary: $35±9$ vs. $48±8$, $P=0.0003$). There were no significant differences between groups 1 and 2 in regard to clinical, echocardiographic and quality-of-life parameters.

Conclusions: Surgical mitral valvuloplasty alone or combined with tricuspid annuloplasty in patients with idiopathic dilated cardiomyopathy result in improvement of clinical variables and quality of life. Selection criteria for patients who should benefit from this type of procedure are yet to be established.

C13-8

MITRAL ANNULAR LONGITUDINAL FUNCTION PRESERVATION AFTER MITRAL VALVE REPAIR: THE MARTE STUDY

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Objectives: Several parameters have been proposed to value the hemodynamic changes on left ventricular (LV) function in patients after mitral valve repair, but no data exist regarding changes in LV longitudinal function in these subjects. The aim of this study was to evaluate changes in LV longitudinal function three months after mitral valve repair in patients with chronic degenerative mitral regurgitation (MR) and normal EF.

Methods: From December 2006 to February 2008, according to our cardiologists measured M-mode mitral lateral annulus systolic excursion (MAPSE) and Tissue Doppler peak systolic annular velocity in 20 patients (25% women, age 68±10 years) with moderate to severe MR and normal EF (60±6%). Examinations were performed preoperatively and three months after surgery. Thirteen patients had mitral prolapse and seven had myxomatous mitral valve disease. Interventions included repair with posterior leaflet resection and application of flexible ring in 14 cases, Alfieri central stitch and application of flexible ring in 2, Alfieri central stitch in 2, and application of flexible ring in 2.

Results: After repair, and Sm (systolic motion) increased from $7.6±1.3$ to $9.2±2.4$ cm/s ($P=0.0071$). MAPSE also increased from $14.0±3.0$ mm to $15.1±2.6$ mm, but the difference was not significant ($P=0.21$). EF decreased from $59±6$ to $51±7\%$ ($P=0.0002$). Both Em and Am decreased, with no changes in the Em/Am ratio (from $1.0±0.4$ to $1.1±0.4$, $P=0.50$) and in the E/Em ratio (from $11.2±3.9$ to $13.8±8.0$, $P=0.11$).

Conclusions: In subjects with moderate to severe MR undergoing mitral valve repair, a postoperative improvement in LV systolic longitudinal function occurs despite significant reduction in EF. In these patients, indices of LV longitudinal systolic function are more sensitive than EF in revealing the beneficial effect of MR surgery.

April 26th, 2008 3rd Congress Day

14:30-16:00

7th Vascular Scientific Session - Vascular Mini-Presentations

V7-1

COMBINED SURGICAL AND RETROGRADE ENDOVASCULAR TECHNIQUE FOR TREATMENT OF CAROTID ARTERY DISSECTION - CASE REPORT

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Objectives: Spontaneous carotid artery dissection is rare but remains one of the main causes of stroke and increasingly recognized cause of headache or ophthalmologic events in young adults. Surgical management of this condition is related to elevated risk of cerebral ischemia.

Methods: We report a case of spontaneous common carotid artery dissection in a 44-year-old woman who was admitted to Neurology Department with a cortical stroke as primary symptom. Spiral computed tomography revealed a dissection and partial thrombosis of the right common carotid artery located in its initial section. The patient was referred to the vascular surgeon for further management. She underwent combined surgical and endovascular procedure in regional anesthesia. After arteriotomy and thrombectomy of the right common carotid artery, retrograde angiography was performed. It confirmed the diagnosis of the dissection. For the treatment Silver stent 8/40 mm was implanted under DSA guidance. Arteriotomy was sutured without patch.

Results: Postoperative angio-CT demonstrated successful revascularization of carotid arteries and patient was referred to the Neurologic Department for supplementary treatment. Three-month follow-up period was uneventful.

Conclusions: Combined surgical and retrograde endovascular technique is feasible for the treatment of dissection of carotid artery and is valuable alternative for open treatment.

V7-2

ENDOVASCULAR REPAIR OF ASCENDING AORTIC PSEUDOANEURYSM: TECHNICAL CONSIDERATIONS USING THE RELAY BOLTON NON BARE STENT ENDOGRAFT

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Objectives: To present a technique for endovascular treatment using custom-made Relay Bolton Non Bare Stent (NBS) delivered via a left common subclavian artery (LSA) approach in a patient with a large asymptomatic ascending aortic pseudoaneurysm after Bentall surgery

Methods: A 61-year-old man underwent Bentall surgery 18 years before admission for a type A dissection. He developed a pseudo-aneurysm originating from the ascending aorta with growing diameter over the years. Imaging with conventional angiography and computed tomographic angiography demonstrated a leakage at the outer curvature at the level of the distal previous anastomosis. Pseudoaneurysm sizes were 95 mm×90 mm. The treatment strategy was to deliver an endograft to seal the ascending aortic pseudoaneurysm via a left subclavian approach. With the patient under general anaesthesia, the LSA was exposed and a transient conduit (Darcon 10 mm) was applied to introduce the custom-made short nose Transport sheath. The custom-made design, a 40×36×65 mm Relay NBS graft was delivered to the ascending aorta, positioned and deployed under pharmaceutically induced hypotension amplified by vena cava balloon occlusion. The patient tolerated the procedure well and the endograft was collocated in the right position without blocking the coronary arteries or the brachiocephalic trunk.

Results: Ascending aortic pseudoaneurysm is a clinical challenge due in part to the significant operative stress in a conventional surgical repair. With a high morbidity risk and a mortality rate ranging between 7 to 40% for conventional surgery, the question is if endovascular surgery could offer an less invasive option in carefully selected cases.

Conclusions: Ascending thoracic endografting is feasible and can repair secondary cardiac surgery complications.

V7-3

CEAS EVERSION AND ROUTINE USE OF INTRALUMINAL SHUNT. WHY NOT?

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Objectives: Evaluation of a surgical technique in CEAS.

Methods: From January 1995 until December 2007 in our operative unit we have performed 2420 CEAS (65% men 35% women) using the eversion technique and intraluminal Pruitt Inhara shunt (immediate or delayed after eversion) 98% of patients received general anesthesia, before clamping 5000 u.i of heparin were administered, all patients maintained antiplatelet therapy until the day of intervention. Mean surgical time was 53 min (35-90), all surgeons of our group have performed CEAS.

Results: Twelve patients suffered a major stroke, four patients died (2 because myocardial infarction), mean time of discharge from the hospital was usually two days and all patient were controlled with an echo color-Doppler after six months.

Conclusions: we consider this technique a good alternative with low risk for training surgeons, sure and easy to perform for 'expert' surgeons.

V7-4

ABDOMINAL AORTIC ANEURYSM AND COEXISTENT ARTERIAL LESIONS: RESULTS OF STAGED AND SIMULTANEOUS SURGICAL REPAIR

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Objectives: To evaluate the results of surgical treatment of abdominal aortic aneurysm (AAA) and concomitant arterial lesions.

Methods: There were 173 consecutive patients who underwent AAA surgical repair. There were 153 (89%) men and 20 (11%) women with a mean age of 63.4±8.4 years (range 23-87). Ninety-six percent of the cases were elective and 4% - urgent admissions. An extensive preoperative examina-

tion was included ultrasound duplex scanning, angiography, CT and MRI. The location of AAA was infrarenal (87.8%), juxtarenal (9.8%) and supra-renal (2.3%). Aneurysms ranged in size from 37 to 164 mm with a mean diameter of 70.8±26.2 mm. The operative approach in cases of infrarenal AAA was laparotomy, in more proximal aneurysms - extended left flank extraperitoneal exposure. In addition, patients with significant lesions of coronary, carotid and renal arteries underwent myocardial revascularization, carotid endarterectomy and renal artery reconstruction, respectively. The operations on abdominal aorta, coronary and carotid arteries were conducted either separately in two stages (19.0%) or simultaneously as one-stage procedure (10.4%) depending on haemodynamical significance of concurrent arterial lesions and type of the aneurysm. The incidence of concurrent coronary artery disease and carotid artery lesion was 90.1% and 73.9%, respectively. Associated essential hypertension was found in 26.5% of cases and chronic obstructive pulmonary disease in 8.7% of patients. Renal artery stenosis were detected in 42.7% and 21.9% of cases, respectively. Coexisting lesions of three arterial regions (coronary, carotid and renal arteries) were observed in 12.1% and lesions of four arterial regions (coronary, carotid, renal and lower limb arteries) in 6.9% of cases. Occlusive and aneurysmal lesions of iliac arteries were found in 29.4% of patients.

Results: In cases of correctable coronary artery disease AAA repair was added by CABG (26.4%) or PTCA (6.8%). 19.4% of patients with significant carotid stenosis underwent carotid endarterectomy. Simultaneous iliac and renal artery reconstructions were performed in 29.4% and 6.8% of cases, respectively. Staged operations in cases of coexistent coronary and carotid lesions were performed correspondingly five and 2.5 times more frequently than simultaneous repairs. The overall in-hospital morbidity and mortality comprised 16.7% and 3.4%, respectively. Mortality following staged repair was 2%. There was no postoperative death following simultaneous reconstructions.

Conclusions: The management of AAA and coexistent arterial lesions includes either staged or simultaneous repair. The choice of surgical strategy depends on the haemodynamical significance of concomitant arterial lesions. The results of staged and simultaneous repair of AAA and coexistent arterial lesions are satisfactory.

V7-5

OUTCOME AND SURVIVAL OF PATIENTS AGED 75 YEARS AND OLDER COMPARED TO YOUNGER PATIENTS AFTER ABDOMINAL AORTIC ANEURYSM RUPTURE (RAAA). DO THE RESULTS JUSTIFY THE EFFORT?

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Objectives: To report and evaluate the early mortality (<30 days) rates and identified preoperative variables that may be predictive of hospital mortality in the elderly patients after emergency repair of RAAA.

Methods: The survey is a prospective study based on prospectively registered data. Seventy-two patients, who were operated on for RAAA in our department from the 1st of January 2005 to the 30th of December 2005, are included in this study. We defined subjects >75 year old as elderly, because of the increased of surgical risk and hospital mortality in this subset of patients (cut-off choice). Demographic, clinical and operative factors were analyzed together with in-hospital mortality. Univariate analysis was performed with χ^2 -test. Multivariate analyses also were performed with the variables that were found to be significant on the univariate analysis.

Results: Of 72 patients admitted with RAAA, 44 (61%) were under 75 years of age and 28 (39%) were 75 years or older. The average age of the population was 72 years with a range from 53 to 85 years of age. Twenty-six of the patients (36%) died in the hospital with early mortality (<30 days). Of the 28 elderly patients who underwent attempted operative repair, 16 (57%) died in hospital, compared to 9 (20%) of 44 younger patients ($P<0.001$). An age of 75 years or older, and a combination between age ≥ 75 years and serum creatinin of >0.125 mmol/l ($P<0.025$) were identified to be significant risk factors for operative mortality. We did not encounter significant differences in the distribution of other risk factors, in the group of elderly patients as compared to the younger ones. There were no significant differences in the total length of stay, and the length of stay in the intensive care unit, between the two groups.

Conclusions: Our study shows advanced age >75 years and combination of this advanced age and Serum Creatinin of >0.125 mmol/l were the only significant ($P<0.05$) preoperative risk factors in our single centre study.

V7-6

ABDOMINAL AORTIC ANEURYSMECTOMY IN RENAL TRANSPLANT RECIPIENTS

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Objectives: The abdominal aortic aneurysm (AAA) prevalence in patients with renal transplant is 1.01%, with a development in younger subjects and with a faster enlargement, suggesting that hemodialysis length, hypertension and steroid therapy may play a role. The aortic clamp during the AAA repair may cause renal damage if the warm ischemia time of the allograft is >60 min, so diverse procedures have been performed to preservation the renal function: The renal oxygen consumption is reduced to 15% in hypothermia at 20 °C. Perfusion with a 4 °C solution reduces the cortical temperature to 13 °C in 5 min, and allows approximately 2 h of reversible ischemia. Externally, the kidneys are also packed with ice. Temporary shunts are performed from the axillary artery or from the abdominal aorta above the aneurysm to the iliac or femoral vessels. These procedures entails the risk of distal arterial dissection or embolization and may increase the risk of haemorrhagic or infectious complications. The technique of ex vivo renal perfusion has been abandoned. Renal perfusion with a cardiopulmonary bypass by cannulation of femoral artery and vein is also low used. Advantages of the endovascular repair are the avoidance of graft ischemia during the aortic cross-clamping, less systemic complications, and consistent reduction in ICU stay. Disadvantages are the need for a large quantity of contrast media and possible damage at the graft anastomotic site. We report our experience in the management of these patients.

Methods: In the last two years two AAA were detected in renal transplant recipients. The cases are a 47 and a 63-year-old men that had both a right-sided renal transplantation three years earlier. A 5.5-cm and a 5.8-cm AAA were confirmed by CT. Resection of the aneurysms were performed and aorto-aortic grafts were inserted. Cold perfusion with heparinized 4 °C ringer lactate and local hypothermia with sterile ice were used.

Results: Renal function did not change after the operation (preoperative serum creatinine level were 1.56 and 2.18 mg/dl; postoperative 1.74 and 2.19 mg/dl, respectively). The two patients are doing well, with good graft functioning after a follow-up of 1.5 and 2 years, respectively.

Conclusions: Open surgery without adjunctive shunts or bypasses remains a viable treatment for these patients. Renal ischemia during aortic cross-clamping can be reduced by cold graft perfusion and local hypothermia. We thought that the endovascular technique should be reserved for patients who meet the anatomical criteria and are at high risk for a conventional operation.

V7-7

THE EFFECT OF ILOPROST ON RENAL DYSFUNCTION FOLLOWING RENAL ISCHEMIA-REPERFUSION INJURY

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Objectives: The purpose of this study was to (i) investigate the effect of iloprost on renal injury during unilateral renal ischemia-reperfusion (IR) in the rat and (ii) determine whether the level of serum cystatin C and beta-2 microglobuline might denote the this injury as markers of glomerular function.

Methods: Twenty four Wistar-Albino rats were randomized into four groups (n=8) as follows: Control (sham laparotomy), renal IR (60 min left renal ischemia and 120 min reperfusion), renal IR+iloprost (20 ng/kg/min intravenous infusion during renal IR period) and Control+iloprost (same protocol described in the renal IR+iloprost group). Blood and kidney tissue samples were obtained for biochemical and histological analysis from all rats. Serum urea, creatinine, cystatin C and beta-2 microglobuline levels were evaluated for biochemical analysis. Histopathologic changes on renal structure were examined for histologic analysis.

Results: Serum urea, creatinine and cystatin C levels were significantly increased in renal IR group (P<0.05 vs. control). Iloprost treatment decreased these three markers in renal IR+ iloprost group (P<0.05 vs. renal IR). Beta-2 microglobuline levels were not significantly changed in any

group. Histological analyses showed that renal IR significantly increased (P<0.05 vs. control group) while iloprost significantly decreased (P<0.05 vs. renal IR) focal glomerular necrosis, dilatation of Bowmans capsule, degeneration of tubular epithelium, necrosis in tubular epithelium and tubular dilatation in renal tissue samples.

Conclusions: The result of this study showed that iloprost attenuates the renal injury induced by renal IR. Serum cystatin C level is the one of the good indicators of acute renal damage due to renal artery ischemia and reperfusion. We have shown that there is no significant difference in the diagnostic accuracy of serum beta-2 microglobuline level for the detection of acute changes in the renal injury subject to renal IR in rat.

V7-8

ADULT STEM CELL AUTOTRANSPLANTATION IN CHRONIC CRITICAL LIMB ISCHEMIA

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Objectives: Recently the therapeutic potential of adult stem cells in the treatment of peripheral arterial diseases has become increasingly evident, since implantation of bone marrow mononuclear cells (BM-MNC) or peripheral blood mononuclear cells (PB-MNC) into ischemic limbs can improve tissue vascularization.

Methods: Thirty patients with severe unilateral lower limb ischemia, with no option for standard revascularization therapies, were treated. Autologous BM-MNC were implanted into the ischemic limb in 13 cases and 17 received PB-MNC. The patients were monitored during 24 weeks with resting ankle-brachial pressure index (ABI), pain-free walking distance and rest pain scale evaluation.

Results: Twenty-one patients had been specifically advised to undergo major limb amputation that was avoided in 14 (67%). ABI significantly improved in the treated limb in both groups. Rest pain significantly improved in both groups at week 4 and at 24 weeks patients were completely pain-free. Pain free walking distance progressively improved in both groups. No related adverse effects were observed in any patient throughout the therapeutic procedure.

Conclusions: The methods of autologous BM-MNC and PB-MNC implantation in patients with critical lower limb ischemia showed to be effective procedures without related complications. These results encourage to continue clinical studies in this field.

V7-9

HISTOLOGICAL CHANGES IN THE THORACIC AORTA AFTER THE INTRALUMINAL DISTENSION. EXPERIMENTAL STUDY IN THE RABBIT

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¹Faculty of Medicine of Valladolid, Spain; ²Cardiovascular Institute of Canarias, Tenerife, Spain; ³High School of Engineers of Valladolid, Spain

Objectives: Understanding the effects of the transversal elongation o distension in the wall artery is very important to now the different circumstances in various situations of the pathology arterial vessels in diver's situations as the injury of the artery and others circumstances.

Methods: An experimental study is performed for evaluation of the effects of aorta distension in the rabbit. The group with injured artery distension is compared with a control group with sham-operation. Histological and ultrastructural findings in experimental group were compared with those in untreated in the thoracic aorta artery with the evaluation of the images of the arterial wall in the intimal, muscular and adventitial zones. The light microscope study is made with standard methods an a eosin-hematoxilin and Masson trichrome stain was performed in the specimens. The electron microscopy study also is development with standard procedure.

Results: Changes in the wall of the artery are detected in the structure of the wall. The intima and muscular layers are the structures with big alterations in the transversal direction. The adventicia layer, have few alterations and your disposition is same in the experimental and control groups. Collagen structure and degradation of elastin is more important after distension of the wall in the muscular layer.

Conclusions: The repercussion of the transversal distension of the aorta is very important in the intima and muscular layers of the aorta with reconstruction whit collagen tissue of the wall.

V7-10

TRANSMISSION OF PRESSURE EVALUATION THROUGH THE ANEURYSMATIC THROMBUS AFTER ENDOVASCULAR ANEURYSM REPAIR. EXPERIMENTAL STUDY IN THE PIG

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Objectives: This study was undertaken to determinate the relationship of intrathrombus and intrasac pressure after endovascular abdominal repair in vivo porcine model.

Methods: Sixteen male pigs underwent creation of an infrarenal aortic aneurysm, with a Dura patch with preservation of lumbar branches. An indwelling pressure transducer was placed in the aneurysm sac. After four week the animals underwent EVAR with a custom-made Wall-graft endograft and provoked the thrombosis of aneurysm sac for electrocoagulation. Aneurysm sac pressure was measured in awake animals in four weeks an three months for evaluation in acute and chronic situation with fresh and organized thrombus.

Results: All twelve animals underwent successful creation of an aortic aneurysm and EVAR resulting in exclusion of the aneurysm sac. Our results show that an increase in sac with thrombus. The thrombus have a increase in volumen.

Conclusions: The thrombus fresh transmitted the pressure in the aneurysm endovascular treated sac. But the thrombus well-organized have a less increase of the pression.

V7-11

PENETRATING AORTIC ULCER: AN EMERGING PATHOLOGY

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Objectives: Penetrating atherosclerotic ulcer (PAU) generally occurs in elderly patients with systemic atherosclerosis. We reviewed our experience of treatment of PAU in thoracic, thoracoabdominal and abdominal aorta.

Methods: Between May 2005 and November 2007, 11 patients (7 men, mean age 74 years; range 65 to 80) with PAU of the aortic arch (n=2), thoracic aorta (n=3), thoracoabdominal aorta (n=4), and abdominal aorta (n=2) were treated. Five patients were symptomatic: one had aortic rupture. All cases were studied with CT-scan both in preoperative period and follow-up (mean 13 months; range 1-26).

Results: Two cases underwent open-surgical repair: one in emergency. Stent-grafts (SG) (Thoracic=6) were deployed in eight cases via femoral access. PAU exclusion was performed by a hybrid procedure in three cases (stent-graft deployment after aortic arch debranching in one case and visceral aorta in the others). Primary technical success was 100%. The patients were discharged a median of 12 days. Four patients required intensive care unit stay. Follow-up CT-scan revealed no leakage, no graft-migration, no neurological deficit, no pseudoaneurysms, no infection and patency of all revascularized vessels in nine cases. No postoperative mortality in 'open' surgical patients. One patient died after endovascular reintervention to treat aorto-esophageal fistula six months after first SG placement. Average renal function remained unchanged during surveillance.

Conclusions: In our experience, endovascular and 'open' surgical repair of PAU appear both safe and feasible techniques with different indications and initial results could be satisfactory, considering the severity of pathology. More patients and longer follow-up are needed.

V7-12

THE LEVEL OF HEAT SHOCK PROTEIN 70 IN ABDOMINAL AORTIC WALL IN DIABETIC RATS

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Objectives: Heat shock proteins have important roles in protecting cell nature. Heat shock protein 70 (HSP 70) increases in cardiovascular system pathologies. Diabetes is also a leading cause of death in vascular pathologies. In our study we tried to investigate prospectively the role of diabetes mellitus directly on the vascular wall, and the difference of (HSP 70) levels

in the serum and abdominal aortic wall in the of streptozotocin-diabetes rats.

Methods: This study involved 16 male Sprague Dawley rat. The animals were divided into two groups as the control group and the diabetic rats group. We used streptozocin injection intraperitoneally in rats to induce hyperglycemia. Rats were sacrificed after two weeks resulting the side effects of diabetes. The infrarenal abdominal aorta were resected for histopathologic assesment. The level of HSP 70 was detected in serum and the tissue.

Results: There was a substantial increase in blood levels and intracellular levels of HSP 70 in the streptozotocin-diabetes rats. Additionally, the degree of vascular injury caused by diabetes was correlated with the tissue and blood levels of HSP 70.

Conclusions: Heat shock protein 70 is a special protective molecule for cardiovascular system. Serum and tissue levels of this protein increases in atherosclerosis, hypertension and ischemic heart disease. In our study the results indicate that HSP 70 level increases in diabetes which plays a major role for vascular pathologies.

V7-13

EFFECTS OF CARBAMAZEPINE ON SPINAL CORD ISCHEMIA

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Objectives: Prophylactic treatment with carbamazepine (CBZ) has been shown to reduce the cerebral damage and neurological deficit in ischemic conditions. A randomized controlled study based on a rabbit model was designed to study the effect of CBZ on a spinal cord ischemic reperfusion injury.

Methods: Thirty New Zealand rabbits were randomly assigned to one of the two groups (n=15 per group): Group I: control group, Group II: carbamazepine group. Spinal cord ischemia was induced by infra-renal aortic cross-clamp for 25 min in both groups. Functional evaluation with the Tarlov score during a 2-day observation period and histopathologic assessment of the lumbar spinal cord were performed. Changes in spinal cord morphology were observed with hematoxylin and eosin (H&E) staining and electron microscopy (EM). Gray matter damage was assessed on the basis of the number of normal neurons in the ventral horn.

Results: Diffuse destruction of gray matter with moderate to severe vacuolization and essentially no normal ganglion cells was observed in the spinal cord of rabbits in the control group, while specimens of rabbits assigned to the CBZ group were able to show ganglion cells with normal nuclei and cytoplasm (P<0.0001). Neurologic impairment was significantly attenuated in the CBZ group compared with the Tarlov scores of the control group, P<0.0001 at day 2.

Conclusions: Carbamazepine may protect spinal cord from ischemic reperfusion injury which is associated with ameliorated neurological and histopathological results.

V7-14

AT THE ORIGIN OF PERIPHERAL ARTERIAL DISEASE: ROLE OF ENDOTHELIN IN ENDOTHELIAL DYSFUNCTION

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Objectives: Endothelin-1(ET-1) is a powerful vasoconstrictor agent produced by the endothelial cells as response to different stress stimuli. We aimed to define the role of Endothelin-1(ET-1) in Peripheral Arterial Disease (PAD) and to determine the relationship between ET-1 circulating levels and the endothelial function assessed by the flow mediated arterial dilation (FMAD), as well as to find out the association of the ET-1 with the clinical presentation of the disease and the inflammatory processes acting in atherosclerosis.

Methods: We carried out a study with a group of 103 patients with clinical PAD and a control group with 38 healthy people. We estimated the endothelial function measuring the FMAD in the brachial artery in all the enrolled individuals. We analyzed the C-Reactive Protein plasma level, as an inflammatory marker in cardiovascular diseases, and measured the ET-1 serum level using the ELISA method. The sample size was calculated for this study with a statistical power of 0.8 and an Alfa error of 0.5.

Results: We found significant differences in ET-1 plasma levels between the patients and the control group (8.76 pmol/l±7.1 vs. 6.45 pmol/l

± 0.89 ; $P=0.002$). The analysis of the pooled sample by clinical stage showed significantly differences in ET-1 levels regarding the severity of the PAD (10.97 pmol \pm 7.9 in patients with intermittent claudication vs. 4.82 pmol/l \pm 2.57 in critical limb ischemia; $P<0.001$). There were no differences in regard to age, genre, cardiovascular risk factors, FMAD and Nitric Oxide plasma levels between the patient groups according to their clinical presentation. Otherwise, we did find significantly differences in hsPCR levels depending on the clinical severity (4.73 [3.32; 7.37] mg/l in the claudication group vs. 16.94 [5.6; 66.37] mg/l in critical ischemia group; $P=0.001$). In the other hand, the correlation coefficient between the ET-1 plasma levels and FMAD measurements was almost valueless ($r=0.040$; $P=0.68$).

Conclusions: Endothelin-1(ET-1) might play a triggering role in peripheral arterial disease, as its elevated plasma levels in the early stages don't increase with the clinical severity progression of the disease.

V7-15

TREATMENT OPTIONS OF GRAFT INFECTIONS AFTER ABDOMINAL AORTIC SURGERY

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Objectives: Aortic grafts infection is a devastating and often fatal complication, following 1-2% of aortic and aorto-femoral reconstructions. Treatment includes infected graft removal, followed either by extra-anatomical reconstruction or by in situ bypass grafting with synthetic or biological grafts (autologous vein, homograft). In the last decade endovascular treatment was proposed as a bridge-solution. The aim of this study is to report the outcome of patients with aortic graft infection treated at our Institution with different techniques.

Methods: Between January 1993 and December 2007, 69 patients underwent surgery for aortic graft infection, associated with aorto-enteric fistula (AEF) in 48 cases (70%). Previous surgery was performed at another Institution in 31 patients (45%). Mean interval between the first procedure and the reoperation was four years (range 1-16). Emergent surgery was performed in 33 cases. Removal of 59 infected grafts and three endo-grafts was necessary in 63 patients (91%), followed by debridement of the infected site. Extra-anatomical reconstruction was done in 38 cases (64%) and in situ reconstruction in 25 cases (40%, silver-coated prosthetic graft in 15 cases, cryopreserved homograft in 10 cases). In case of AEF, simple duodenal repair was performed in 34 cases (71%) and resection with primary anastomosis in 14 cases (29%). Two patients underwent simple drainage of perigraft collection followed by repeated washings. Endovascular treatment was used in four patients with AEF. Mean follow-up was 56 months (range 3-154).

Results: Thirty-day mortality was 22% (15/69). Graft occlusion occurred in seven patients (10%), treated with thrombectomy. In two cases a major amputation was required. Early mortality and morbidity rates were 36% (9/25) in the in situ reconstruction group and 32% (12/38) in the extra-anatomical group ($P=NS$). Aorto-enteric fistulas and emergency presentation were found to be independent predictors of mortality (29% vs. 5%, $P=0.05$; e 33% vs. 6%, $P=0.01$, respectively). At 36 months, mean survival rate was 39% (27/69). No statistical differences were found between in situ reconstruction with prosthetic graft, with homograft or extra-anatomical reconstruction. Eighth/10 patients treated with implantation of a cryopreserved homograft died at follow-up; of the two surviving, one patient underwent reoperation for graft infection.

Conclusions: Mortality after surgery for aortic graft infection is high and mainly related to the presence of AEF. Based on our experience, there are no differences between in situ and extra-anatomical reconstruction in terms of mortality and morbidity rates. Cryopreserved homografts do not seem to provide significant advantages on long-term survival.

V7-16

TEZOSANTAN REDUCES THE RENAL INJURY INDUCED BY ABDOMINAL AORTIC ISCHEMIA-REPERFUSION IN RATS

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Objectives: The aim of this study was to examine the effect of tezosentan on renal injury induced by abdominal aortic ischemia-reperfusion (IR) in rats.

Methods: Twenty four Wistar-Albino rats were randomized into three groups (eight per group). Control group underwent laparotomy and dissection of the infrarenal abdominal aorta without occlusion. Aortic IR group underwent laparotomy and clamping of the infrarenal abdominal aorta for 120 min followed by 120 min of reperfusion. Aortic IR + tezosentan group underwent same aortic IR periods, and received a bolus intravenous injection of 10 mg/kg tezosentan before ischemia plus continuous intravenous infusion of 1 mg/kg/hr tezosentan during 120 min ischemia and 120 min reperfusion. Blood and kidney tissue samples were obtained for biochemical and histological analysis from all rats, respectively.

Results: Biochemical analysis showed that, aortic IR significantly increased ($P<0.05$ vs. control group) while tezosentan significantly decreased ($P<0.05$ vs. aortic IR) the plasma levels of malondialdehyde, superoxide dismutase, catalase and myeloperoxidase. Histological analyses showed that aortic IR significantly increased ($P<0.05$ vs. control group) while tezosentan significantly decreased ($P<0.05$ vs. aortic IR) focal glomerular necrosis, dilatation of Bowmans capsule, degeneration of tubular epithelium, necrosis in tubular epithelium, tubular dilatation and interstitial inflammatory infiltration in renal tissue samples.

Conclusions: The results of this study indicate that tezosentan reduces renal injury induced by aortic IR in rats. We think that tezosentan exerted this beneficial effect via reducing oxidative stress and lipid peroxidation, inhibition of leukocyte infiltration into renal tissue and acting cytoprotective on renal tubular cells after aortic IR.

V7-17

OPEN STENT-GRAFT PLACEMENT AS AN ALTERNATIVE OF TOTAL AORTIC ARCH REPLACEMENT - FATE OF STENTED ANEURYSMS

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Objectives: Open stent-graft placement for distal arch aneurysm was performed under selective cerebral perfusion instead of prosthetic total arch replacement in 42 cases. This paper investigated early results of open-stent procedure and complication of this procedure. Also, the fate of the excluded lumen of the aneurysms was examined by postoperative serial CT examination during follow-up period.

Methods: Open stent grafting for distal aortic arch aneurysm was performed in 42 cases of atherosclerotic distal aortic arch aneurysm during 1997 to 2007. The Gianturco Z stent was sutured to the distal end of woven Dacron graft and inserted into descending thoracic aorta through a sheath catheter via hemicircular incision on the normal proximal aorta under transesophageal echo guidance. After manual anastomosis of the proximal end of the stent graft, the hemicircular incision of the proximal aorta was closed. Thirty-seven cases were treated with the above mentioned procedure. Five cases required additional total arch replacement with open stent grafting because of proximal extension of aortic arch aneurysm. Operative parameters, such as ECC time, selective cerebral perfusion time, amount of intraoperative and ICU bleeding were compared with cases who received total arch replacement during same period (26 cases) Fate of the excluded region of the aneurysms were serially examined by enhanced CT.

Results: Open-stent procedure reduced extracorporeal circulation (ECC) time (128 vs. 202 min), intraoperative bleeding (420 ml vs. 760 ml) and postoperative bleeding in ICU (670 ml vs. 830 ml) compared with cases required total arch replacement. Open-stent procedure revealed good hospital mortality (2/41, 4.9%) and late mortality (pneumonia 1/39, 2.6%). However, there was one paraplegia (1/41, 4.9%) and two cerebral embolism (2/41, 9.8%), which induced hospital mortality. The excluded aneurysmal space was disappeared or shrunk during follow-up time in 36 of 38 cases (95%). Two cases showed endoleakage from proximal anastomosis and required coil embolization. There was no aneurysmal rupture in these 38 cases during nine years follow-up period.

Conclusions: Although there is a low risk of cerebral embolism and paraplegia, open-stent placement is feasible for treatment of distal aortic arch aneurysm, especially distally extended aortic arch aneurysm instead of total arch replacement.

V7-18

GENETIC ANALYSIS OF CONNECTIVE TISSUE IN PATIENTS WITH CONGENITAL THORACIC ABNORMALITIES

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Objectives: The most common congenital chest wall deformity is pectus excavatum, which is characterized by depression of the sternum, resulting in reduced internal thoracic volume and displacement of the heart and could be combined with congenital cardiac abnormalities such as VSD. Pectus excavatum is also a major component of many connective tissue disorders such as Marfan Syndrome. The main cause of sternal depression is thought to be elongation of the costal cartilages. The goal of our study was to analyze the genetic profile of rib cartilages from patients with pectus excavatum in comparison with normal cartilage.

Methods: Resections of the deformed cartilages were performed in the course of the corrective surgery by modified Ravitch procedure in 11 patients with pectus excavatum (ages 3-27). The control samples were obtained from five healthy donors (ages 6-17). Samples were hybridized onto Affymetrix U133 plus two Gene Chips. Microarrays were normalized and intensities were derived using GC Robust Microarray Analysis. A bayesian *t*-test was used to calculate statistical significance and was modified to a False Discovery Rate (FDR) by the Benjamini and Hochberg method. Genes were considered significant with a FDR <0.05 and an absolute fold change > 1.7. Gene ontology, chromosomal location and pathway analysis were performed using NIH David 2007 and were considered significant with FDR <0.05.

Results: Gene expression analysis revealed 238 statistically significant up-regulated (1.7-51.9 fold) and 52 down-regulated (2.5-8.3 fold) genes. Chromosomes 12, 2 and 6 were found to be most affected globally. Cytoband 19 p13.3-q13.2 was found to be the most significant chromosomal region with a FDR of 0.034. Collagen (including COL2A1, COL9A1, COL27A1, COL9A2, COL4A2 and COL3A1 genes) was found to be significantly represented in cellular component ontologies (FDR=0.039). Four genes ranked the highest by fold change and FDR, four genes associated with cytoband 19 p13.3-q13.2, and six genes related to collagen were further validated by real-time reverse transcriptase-polymerase chain reaction (total 14 genes). Using current databases, no pathway was found to be significant at this time, however, molecular mechanisms of pectus excavatum continue to be defined and documented.

Conclusions: Multiple collagen genes were found to be significantly dysregulated. Gene expression analysis confirmed hyalin cartilage involvement in the development of congenital thorax abnormalities and enables further refinement of the up-stream genetic factors critical in triggering deformity evolution as a significant component of connective tissue disorders.

V7-19

LIMB SALVAGE USING HOMOGRAFT VESSELS

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Objectives: Autologous greater saphenous vein (GSV) is the ideal graft for infrainguinal arterial reconstruction in the cases of threatened limbs. If this vein is not available because of previous operations or the size or quality of vein is not satisfactory, implantation of deep frozen homologous artery or vein may offer a therapeutic option. Graft patency and limb salvage rate were examined in our tertiary academic center in a ten years period (1997-2007).

Methods: In our department we have been operating a homograft bank since 1997 and in ten years we implanted 84 homografts in 72 patients for threatening limb ischemia. The average number of previous operations were 2.6 operations/patient. Single run off vessel was documented in 58, two vessel run off was seen in 14 patients. Fifty-five patients had gangrene, 17 patients had rest pain. Twenty-two patients' saphenous vein was already used at the time of previous surgeries, in the other cases GSV was found to be unsuitable for graft creation by preoperative examination or at the time of surgery. Femoro-popliteal suprageneal bypass was performed in four cases, in 10 cases infrageneal femoro-popliteal bypass and in 58 cases femoro-crural bypass was created.

Results: In-hospital mortality was 1.2%, 30 days mortality was 3.6%. Peripheral pulse returned in 34 cases. Early reocclusion was diagnosed in

seven cases (8.3%), 21 other grafts occluded in the follow-up period (25%). Successful reoperation was performed in seven cases and in two cases thrombolysis saved the graft.

Conclusions: Life table analysis showed a 66% limb salvage rate and a 53% secondary patency rate at three years. No statistical difference was noticed when we analyzed the possible difference between artery and vein and ABO blood group crossmatching. Based on our data homograft blood vessel implantation is a good option to save threatened limbs in Fontaine III-IV stages.

V7-20

NEW VASCULAR PROSTHESIS WITH METALLIC SILVER IN THE TREATMENT OF VASCULAR GRAFT INFECTION - PRELIMINARY REPORT

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Objectives: Synthetic vascular prosthesis are commonly widespread with good reputation in vascular surgery. The only unsolved problem is graft infection. It is always difficult to eradicate and, if not recognized or adequately treated, eventually causes prosthesis failure, hemorrhage, or sepsis. Even in experienced centers and in recent series, mortality and amputation rates associated with infected grafts remain significant. There are some methods of treatment including graft replacement with autologous vein or arterial allograft. Those materials are more resistant to infection but also less mechanically resistant. The alternative can be dacron prosthesis impregnated with silver. There are two kinds of those prosthesis: one with silver acetate and a new one, with metallic silver which are made to relies silver for a long time (SilverGraft BBrown AG Melsungen, Germany). The aim of the study is to present preliminary results of treatment of vascular graft infection by replacement with new vascular prosthesis with metallic silver.

Methods: Between November 2007 and January 2008 three patients we performed prosthesis replacement for one with metallic silver. In all patients the indication was vascular graft infection: one ileo-femoral graft implanted one month ago during endovascular aneurysm repair and two infections in the groin affecting one limb of bifurcated aorto-femoral graft. The ileo-femoral graft was totally replaced and in remaining two cases one limb of bifurcated graft was resected and replaced by silver prosthesis. Debridement of surrounding tissues were performed intraoperatively. Patients received piperacilin/tazobactam, imipenem and itarconazol iv for 14 days.

Results: In all cases operative wounds healed uncomplicated in short observation period (1-2 months). There was no signs of persistent infection and patients were discharged in 12th, 16th, and 19th postoperative day.

Conclusions: Short-time data of using SilverGard prosthesis in case of vascular graft infection seems very promising.

V7-21

CALCIUM DOBESILATE AND OXERUTIN: EFFECTIVENESS OF COMBINATION THERAPY

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Objectives: Calcium dobesilate and oxerutin are well known alternatives in the treatment of venous insufficiency. Both drugs are shown to be effective individually but the effectiveness of a combination of both drugs has not been shown yet.

Methods: One hundred and fifty patients with primary venous insufficiency were randomised into three groups: Group A receiving calcium dobesilate only, Group B receiving oxerutin only and Group C receiving both, calcium dobesilate and oxerutin. Patients were evaluated with a questionnaire before and four weeks after treatment regarding following parameters: itching, fatigue, heaviness, numbness, cramp, swelling and sensitiveness. Patients rated their symptoms from 0 to 4 (0: absent; 1: mild; 2: moderate; 3: severe; 4: very severe). Circumference of legs were measured at two levels (10 cm below the lower margin of the patella and 5 cm above the malleoli). Venous ulcer diameters were measured if present. Age, sex, body mass index, waist-to-hip ratio, smoking habit, history of hemoptysis and/or dispnea, presence of pigmentation were also recorded. Whole blood count as well as renal and hepatic function tests were performed.

Results: There was no difference regarding demographic data, statistically (Table 1). Rated values decreased more in Group A vs. Group B but most in Group C, except itching, which decreased more in Group B when compared to Group A ($P < 0.05$). Furthermore ulcer diameter reduced more in Group C, prominently (Table 2). There was no difference regarding hepatic and renal function tests as well as whole blood count before and after treatment.

Conclusions: Calcium dobesilat and oxerutin are widely used medications for treatment of venous insufficiency. Combination of both drugs revealed better results in reducing subjective symptoms. Combination therapy seems to be safe because none of the groups demonstrated prominent changes in biochemical tests. In conclusion, combination therapy was found to be more effective in the treatment of venous insufficiency. But these results should be confirmed with objective tests.

V7-22

THE USE OF HIGH SENSITIVITY C-REACTIVE PROTEIN AND ADIPONECTIN AS BIOMARKERS FOLLOWING ENDOVASCULAR REVASCLARISATION FOR LOWER LIMB PERIPHERAL VASCULAR DISEASE

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Objectives: Current assessment of the treatment of peripheral vascular disease utilising Ankle Brachial Pressure Index is subject to limitations. Adiponectin is an adipocyte derived peptide that is thought to be involved in the development of atherosclerosis. High sensitivity CRP (hsCRP) are known to be associated with inflammatory conditions such as those responsible for atherosclerosis. This pilot study examines if circulating levels of these two biomarkers correspond to the changes in Ankle Brachial Pressure Index noted after patients have undergone endovascular revascularisation.

Methods: Venous blood samples were obtained and Ankle Brachial Blood Pressure Indices were measured before patients underwent lower limb endovascular procedures. Blood samples were taken and Ankle Brachial Pressure Index were repeated 12 h post procedure. hsCRP and Adiponectin were measured via competitive enzyme-linked immunosorbent assay (ELISA).

Results: Ten patients (6 male: 4 female, Average age 71.2 years) underwent percutaneous angioplasty. All patients had Rutherford category four ischaemia with the target lesions classed as Trans Atlantic interSociety Classification (TASC) grade B lesions. An increase in ABPI was noted after the procedure (Standard deviation=0.067, $P < 0.0001$). Likewise there was a significant increase in post procedure hsCRP (Wilcoxon's signed ranks Two sided $P = 0.027$). In comparison there was no significant change in Adiponectin levels (Wilcoxon's signed ranks test Two sided $P = 0.0537$).

Conclusions: Changes in hsCRP protein correlate with an increase in Ankle Brachial Pressure in individuals who have undergone endovascular angioplasty. In keeping with its proposed role as an atheroprotective molecule, Adiponectin levels did not show an immediate change in circulating levels.

V7-23

ANEURYSM OF THE INFERIOR VENA CAVA: CASE REPORT

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Objectives: Aneurysms of the inferior vena cava (IVC) are extremely rare. According to the current literature, only 29 cases of IVC aneurysms are published. We present one new case of surgically treated symptomatic saccular aneurysm of the infrarenal IVC.

Methods: Diagnosis of IVC aneurysm was made by abdominal CT scan. The operation was performed using the right retroperitoneal approach with extrapleural resection of the 11th rib.

Results: The 27-years-old patient presented with moderate lower limb swelling and mildly tender non-pulsatile mass in the right lower abdominal quadrant. Blood tests and thrombophilia screens revealed normal findings. Duplex ultrasonography showed organized thrombosis of both iliac veins. Abdominal CT scan revealed thrombosis of the infrarenal IVC and large (72x87 mm) saccular aneurysm arising from the right lateral

wall of the IVC. The aneurysm displaced and compressed the right kidney, right renal artery and the right ureter and was adherent to these structures. After the opening and partial resection of the aneurysm, we found that the lumen of the entire infrarenal IVC and both iliac veins was completely obliterated with an old organized thrombus. Renal veins and suprarenal IVC were free of thrombosis, with excellent back-bleeding. After several unsuccessful attempts of iliac vein thrombectomy we concluded that IVC reconstruction was not possible. The aneurysm and the infrarenal part of IVC were completely resected without complications. The remaining IVC was closed just below the right renal vein, preserving the venous drainage from the right kidney, and just above the iliac vein confluence. Histopathologic examination found alterations in all three layers of the aneurysm wall, with destruction of the intima and fragmentation of muscle and elastic fibres in the media. Patient completely recovered, with only mild signs of lower extremity venous hypertension. He was discharged on the eight postoperative day with anticoagulant warfarin therapy and compression stockings. During the six month follow-up no complications developed, and the leg swelling completely resolved.

Conclusions: Thrombosed IVC aneurysm may mimic a retroperitoneal tumour. In some cases, CT and MRI findings may be equivocal. Because of the low incidence of the IVC aneurysms, their natural history is not known and there are no recommendations for their treatment. Surgical treatment is indicated in all symptomatic and low-risk asymptomatic cases.

V7-24

DEBRANCHING OF EPIAORTIC VESSELS FOR THE TREATMENT OF TYPE-B AORTIC DISSECTION INVOLVING THE ARCH

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Objectives: Conventional surgery of type-B aortic dissection (B-AD) involving the arch is still hampered by consistent risk of mortality and neurologic complications. Thoracic endovascular stent-graft repair (TEVAR) required a preventive revascularization of epiaortic vessels to allow the aortic arch coverage. Here we report our experience with two patients in the hybrid treatment for B-AD involving the arch.

Methods: Patient n. 1: a 56-year-old man was admitted for an acute B-AD involving the distal arch, left subclavian artery (LSA), visceral vessels, and the abdominal aorta up to both common iliac arteries, with a small ascending aortic aneurysm. An emergency surgical option was considered because of the substantial risk of impending rupture, highlighted by the persistence of chest pain and unresponsive hypertension. Our strategy consisted of a simultaneous hybrid treatment: to achieve an adequate proximal landing zone, under local anesthesia, a prosthetic bypass graft between the right and left common carotid arteries was accomplished and TEVAR from origin of brachiocephalic artery, with oversteenting of the left carotid and subclavian arteries, to the celiac axis was thereafter performed. Patient 2: a 51-year-old man, previously treated for B-AD with TEVAR, was admitted because of a presence of a proximal type-I endoleak with retrograde dissection of aortic arch. Simultaneous hybrid treatment was planned: under general anesthesia, the preventive revascularization of the epiaortic vessels were performed by a bifurcated prosthetic bypass from the ascending aorta to the both common carotid arteries and to left subclavian artery. TEVAR was thereafter performed from the ascending aorta, distally to origin of the prosthetic graft, to the descending aorta, covering brachiocephalic, left common carotid and subclavian arteries.

Results: No death, steal phenomena, left arm ischemia, or cerebrovascular accident occurred. The patients were discharged on the fifth and seventh postoperative day, respectively. At nine and six months follow-up, respectively, both patients did well and the computed tomographic scan confirmed patency of the prosthetic bypass grafts and complete thromboexclusion of the false lumen.

Conclusions: This less invasive technique, avoiding conventional high risk surgery and cardiopulmonary bypass, allows surgical treatment for greater number of patients with severe thoracic aortic disease. TEVAR major challenges are related to the conformability and durability of the current generation of endografts: short- and mid-term outcomes after endografting B-AD are encouraging. However, this hybrid approach does not preclude the possibility of a secondary TEVAR or of a conventional surgery of the aortic pathologies if and when required.

V7-25

IMPLANTATION OF AUTOLOGOUS BONE MARROW CELLS IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Objectives: Patient with critical ischemia who are not candidate for invasive revascularization have impending limb loss. About 30% of patients with critical limb ischemia cannot be treated by any methods and the only option is amputation. We showed that metabolic intervention with antioxidant and L-arginine can enhance beneficial effects with implantation of bone marrow cells (BMCs). We performed a long-term controlled trial to assess the safety and efficacy of intrarterial autologous implantation of bone marrow cells (BMC) infusion with oral vitamin E and C and L-arginine in patients with Chronic peripheral arterial disease.

Methods: We enrolled 18 patient with critical limb ischemia. All patient had intermittent claudication, rest pain, ischemic ulcers and were not candidates for surgical revascularization. Exclusion criteria were malignant disease, myocardial infarction or brain infarction, severe heart failure. Total mononucleated cells obtained from the patient ranged from 13.3 to 60.3 ×1000000000 µm. The infusomat fmS braun infusion pump was used. Two doses of implantation of bone marrow cells (BMCs) (time 0 and 45 days) were injected in the common femoral artery of the affected leg. After 30 days the patients received 400 UI vitamin E, 1 g of vitamin C and 2 g of L-arginine. The end point were the leg salvage, improvement of ulcers, improvement of pain. After admission (T0) all patient were seen at 3-6-12-18 (T1-2-3-4) months.

Results: Patients treated safely and no serious reaction, were observed during this study: at T1, T2 time point follow-up the ABI value increased in 10 patient and 13 patient at T4. Twelve showed a decreased of the pain score at T3 and T4. The improvement of the pain free walking distance was consistent at T2, T3 and T4. Laser Doppler index, which reflect microcirculation, were also significantly improved between T3 and T4 after treatment. Similarly, an improvement of the venousarteriolar reflex activation was observed with Laser Doppler evaluation which resulted normalized completely in eight cases. More important after one year the number of neocapillaries increased significantly in tibia toe and foot. Finally, angiographic evaluation illustrated collateral vessel formation at six months.

Conclusions: Results showed significant improvements in the ABI, ulcers healing, maximum walking distance, microcirculation blood flow. Metabolic intervention with antioxidants and L-arginine could help the differentiation of BMCs. In the study we show that BMC arterial infusion together with metabolic intervention is a long-term safe and effective therapeutic procedures in improving major clinical indexes and enhancing neovascularization capacity represent a promising therapeutic approach.

V7-26

ARTERIAL SURGERY IS ASSOCIATED WITH TOLL-LIKE RECEPTOR 2 AND 4 DECREASE WHICH IS INFLUENCED BY SMOKING

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Objectives: Toll-Like Receptors (TLR) are major contributors to innate immune signaling, but also capable of inducing an acquired immune response. TLR response can be measured by production of pro-inflammatory cytokine tumor-necrosis factor alpha (TNF-alpha) following stimulation of whole blood leukocytes. In this study we evaluated the hypothesis that surgical arterial trauma is associated with a decrease in TLR response, and investigated the time course of the altered responsiveness. In addition, TLR responsiveness was related with baseline patient characteristics.

Methods: Thirty-five patients undergoing arterial surgery and a control group of nine patients undergoing pacemaker replacement were included in the study. Blood samples were drawn before, during and immediately after vascular surgery and 24 h postoperatively. In all samples TLR2 and TLR4 expression were measured with flow cytometry. The samples were incubated with 5, 50 and 500 ng/ml Pam3Cys and with 1, 10 and 100 ng/ml of lipopolysaccharide (LPS). In the supernatant of these stimulated samples TNF-alpha was measured with an enzyme-linked immune fluorescent assay (ELISA).

Results: We observed a dose dependent response in TNF-alpha following stimulation with both LPS and Pam3Cys ($P < 0.0001$). The TLR response decreased significantly after arterial trauma ($P = 0.022$) and persisted in the 24 h post operative period, whereas this effect was not observed in the control group. The TLR2 expression decreased significantly immediately after surgery ($P = 0.005$) but increased 24 h after surgery ($P < 0.0001$). Furthermore, an inverse relation between the TLR response and smoking was observed ($P = 0.026$).

Conclusions: TLR2 and TLR4 response declines rapidly following arterial trauma in patients undergoing vascular surgery. These results point to a unifying role for TLRs in the induction of post-operative immune tolerance, which might serve as a handle for the prevention of postoperative infections. Furthermore, smoking is negatively related to the baseline TLR response.

V7-27

SIXTEEN YEARS EXPERIENCE WITH AORTO-ENTERIC FISTULAS

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Objectives: Aorto-enteric fistula (AEF) represents a rare complication of reconstructive aortic surgery. Beside the septic complications in particular, solid gastrointestinal bleeding threatens. The prognosis still remains poor due to hemorrhagic shock and septic complications on the basis of the prosthetic infection. Aim: to summarize the results during the last 16 years applying the in situ reconstruction for the treatment of primary and secondary aorto-enteric/prosthetic-enteric fistulas.

Methods: Since 1990, 32 patients (M:F=24:8, mean age 69 years) with either primary ($n=7$) or secondary ($n=25$) aorto-enteric fistulas were operated. There were 28 patients with an aorto-duodenal and four patients with an aorto-colic fistula. The manifestation of the aorto-enteric fistula followed in average 60 months (0-225) after the initial operative procedure. In five cases an extra-anatomical reconstruction (axillo-bifemoral) combined with an aortic ligation was performed. The remaining 27 patients received an anatomical in situ reconstruction with a Dacron graft and coverage with omentum majus.

Results: The total in-hospital mortality was 13% (4/31) with three deaths in the in situ group and one out of five in the Ax-fem group. One amputation became necessary in the in situ group, and additional surgery was necessary in 25% (8/32). During follow-up (22 months in average) a total of 26 secondary interventions were necessary, 15 out of which were carried out in five patients with an extra-anatomical reconstruction. Furthermore, one above-knee amputation became necessary in the in situ group. During follow-up all patients with a primary and 19 of the 27 patients with a secondary aorto-enteric fistula were free of infection. In three patients it came to a recurrent aorto-duodenal fistula, which could be successfully controlled in two cases by orthotopic revascularisation, whereas the third patient succumbed in multi organ failure.

Conclusions: It is possible to achieve acceptable mortality rates in this group of complicated patients with an aorto-enteric fistula, but to the prize of multiple procedures, and a high relapse rate. The numbers do not allow any differentiation between the in situ reconstruction and the axillo bifemoral bypass group, although the ax-fem does not seem to be straight-forward.

V7-28

EFFECTIVENESS OF USING OF A NEW COMBINED DRUG 'CYTOFLAVIN' FOR TREATMENT OF PATIENTS WITH PERIPHERAL ARTERY DISEASE

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Objectives: Effects of intravenous infusions of new developed drug 'Cytoflavin' (combination of succinic acid, inosine, nicotinamide and riboflavin) on painfree walking distance (PWD), maximal walking distance (MWD) and ankle brachial index (ABI) in patients with peripheral arterial disease (PAD) (Fontaine stage II-III), were assessed in this clinical study.

Methods: The patients with previous history of typical intermittent claudication during at least six months (18 persons) were selected to participate in this trial. The following inclusion criteria were used: standardized painfree walking distance 200 m or less; ankle brachial index 0.7 or less with further decrease after exercises. Treatment programme included 10 everyday intravenous infusions of 20 ml of Cytoflavin (added in 200 ml of 0.9% solution of

NaCl). Treadmill tests and measurements of ABI were done before and just after this course of infusions.

Results: Analysis of the results demonstrated the following changes of the studied parameters: - PWD: average increasing 38.5% (from -5% to +89%); - MWD: average increasing 44.8% (from +7% to +122%); - ABI: average increasing 7.3% (from -12% to +18%); All of the patients marked improving of their quality of life. As a result of this treatment. In two patients with diabetes mellitus regressed symptoms of peripheral neuropathy.

Conclusions: This study demonstrates that using of Cytoflavin is effective and leads to positive modifying of the natural course of intermittent claudication and improves blood circulation in the ischemic lower extremities.

V7-29

EXPLANTATION OF AN AORTO-UNILIAC ENDOGRAFT WITH SUPRARENAL BARB FIXATION: A CASE REPORT

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Objectives: The explantation of an endoprosthesis from the abdominal aorta is subject to high morbidity and mortality rates. Below is the description of a case of urgent surgical removal of a thrombosed endoprosthesis.

Methods: The case history: a 67-year-old patient, fitted with an aorto-aortic prosthesis for AAA in 1997, in May 2007 aorto-right uniliac endoprosthesis and cross-over femoro-femoral bypass for an aneurysm of the common right iliac and occlusion of the common counter-lateral iliac; on the 27th day p.o., thrombosis of the endograft was detected, which was treated with locoregional thrombolysis and anticoagulant therapy. After 30 days, thrombosis of the entire endoprosthesis was again detected, with an occlusion immediately below the origin of the renal arteries. It was thus decided to proceed urgently with the surgical explantation of the graft by means of median xifo-pubic laparotomic access. To explant the endoprosthesis, a 20 ml syringe was used which was appropriately cut in the tapering portion.

Results: Having executed a longitudinal incision in the tube and liberated the distal portion of the endoprosthesis, the team proceeded with the removal of the iliac extension. Having anchored the tape of the distal extremity of the endoprosthetic body, the latter was inserted into the syringe, after the insertion of an aortic balloon for celiac clamping. It was decided to proceed with celiac aortic clamping using the balloon due to the presence of a hostile abdomen. Having inflated the aortic balloon and lengthened the section of the tube as far as the proximal anastomosis, the syringe was pushed cranially (keeping the endoprosthesis still) so as to cause the collapse of the suprarenal anchoring hooks. After everything was removed, standard infrarenal clamping was performed; the duration of the manoeuvre was approximately 2 min. The operation was completed with an aortobifemoral graft. The procedure took place, after administration of vitamin K, under blended anaesthesia (thoracic peridural and general) and controlled hypothermia; it required the infusion of 2800 ml of blood and 600 ml of plasma, and 20 h stay in Intensive Care. The patient was discharged on the 9th day in good overall condition.

Conclusions: Surgical conversion after EVAR is a technically demanding operation which is potentially lethal for the patient, especially in cases involving grafts with suprarenal anchoring.

Using easily-obtained materials, the technique used in this case permitted the removal of the endoprosthesis while conserving the renal vessels and the aortic walls.

V7-30

ANATOMICAL BRANCHED VASCULAR PROSTHESIS IN THE SURGICAL TREATMENT OF THE THORACOABDOMINAL AORTA: OUR INITIAL EXPERIENCE

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Objectives: The thoracoabdominal extension of the surgical aortic pathology (including both primary atherosclerotic aneurysms and pseudoaneurysms based on previous dissections) represents the major challenge for vascular surgeon. During reconstructive vascular procedure and aortic crossclamp-

ing, adequate perfusion of the spinal cord, liver, kidneys, gut etc. should be maintained. The till recently most widely used Crawford's inclusion technique consists in the vascular prosthesis inlay within the aneurysmal sac. Oxygenated blood supply to the feeding branches below the aortic crossclamp is usually provided by atri-femoral bypass and intraluminally placed perfusing catheters. The original arterial ostia are, some in shape of common patches, connected with the corresponding holes excised from the graft's sides. However, at the longer term follow-up, the visceral patch aneurysms can develop due to the incomplete radicality during the original aortic aneurysmal replacement.

Methods: During 2007, the anatomical branched Coselli Thoracoabdominal Graft (Vascutek, Inchinnan, Scotland, UK) was used in four patients at our institution. These were three men and one woman, of the average age of 52 years (34-62). The two true thoracoabdominal aneurysms (TAAA) and two postdissection TAAA were diagnosed. In two patients, previous ascending aorta and arch procedures including the elephant trunk technique were used, both for the previous A dissection and distal extension in Marfan syndrome and a true aneurysm. In other two, either progressive dilatation of the previously untreated B dissection or the diaphragmatic aortic segment aneurysm following the previous TAAA IV resection were present. In all, TAAA resection and replacement with the Coselli graft was performed, with the use of atri-femoral bypass, selective visceral perfusion and the common techniques preventing the spinal cord ischaemia.

Results: Three patients survived the procedure and were discharged from the hospital, one patient was lost shortly after the operation due to the visceral malperfusion. The mean surgery duration was 7 h (4, 30-9), m.blood loss 18.3 l (m. 13.5 l recuperated), mean ICU stay in survivors 28 days (10-53), mean hospital stay 42 days (21-76). No paraplegia occurred in survivors. In one, tracheotomy and prolonged artificial ventilation were inevitable and certain degree of pulmonary dysfunction occurred in all patients surviving operation.

Conclusions: The concept and introduction of the Coselli Thoracoabdominal Graft with prewoven integral side branches eliminates the risk of aneurysmal patch formation and offers more radical approach for the surgical treatment of the thoracoabdominal aortic aneurysms including the complex and most challenging postdissection cases. The authors' initial experience is herewith introduced.

April 26th, 2008 3rd Congress Day

14:30-16:00

7th bis Vascular Scientific Session - Abdominal and Thoracic Aorta

V7bis-1

HYBRID PROCEDURES FOR COMPLEX AORTIC PATHOLOGY: AN INITIAL SINGLE CENTRE EXPERIENCE

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Objectives: Review the experience of a single center in the treatment of the complex aneurysms of the thoracic aorta with branch involvement.

Methods: Prospective records of 47 patients with complex aortic aneurysms undergone to hybrid procedures, between 1998 and 2007, were retrospectively reviewed. Forty six patients were men. They were divided in two groups. Group A patients with aortic arch repairs (3 ascending replacement, 6 frozen elephant trunk, 13 carotid-carotid bypass, 12 carotid-subclavian revascularizations, 4 total arch debranching) Group B patients with thoracoabdominal aneurysms and visceral transpositions (4 partial and 5 total debranching). Mean age was 69.3±1.3 years (range 62-73) and 71.5 5.0 years (range 68-74) for group A and B, respectively.

Results: The mean hospital length of stay was 18±7.1 days (range, 5-35) and 12±8.2 days (range 2-15), for group A and B, respectively. The overall mortality was of 12.7% (5.1% and 44% for A y B groups, respectively), and the neurological morbidity was 4.2% (2.6% y 11% for A and B groups, respectively).

Conclusions: Even though the endovascular correction is more safe than the open traditional surgery, until follow-up of long term results are disponible, the hybrid techniques should be reserved for high-risk patients. These procedures have better results in the supraortic trunks.

V7bis-2**FIFTEEN YEAR EXPERIMENT OF ENDOVASCULAR AORTIC REPAIR FOR DESCENDING THORACIC AORTIC PATHOLOGIES**

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Objectives: Recently, the endovascular repair for diseases of descending thoracic aorta has become a viable alternative to open repair and is often the approach of choice for high-risk patients. Our group has started EVAR (endovascular aortic aneurysm repair) using homemade stent-grafts from 1993 for 752 cases. Stent-graft was composed of Gianturco Z stent and a thin wall polyester woven graft. The aim of this study is to elucidate efficacy and long-term results of our stent graft treatment for descending thoracic aortic pathologies.

Methods: From January 1993 to December 2007, 274 patients (172 male and 102 female, mean age 74±14 years) were enrolled. TEVAR were done for 113 degenerative aneurysms (41.2%) and type B dissection 161 (58.7%) including 30 acute type B dissection. Mean follow-up was 66.4 months (range, 0-156 months).

Results: An optimal deployment with exclusion of the aneurysm and/or closure of the entry tear in dissection was achieved in 96.7% (265/274). No spinal cord injuries were observed. Strokes were observed in only 0.7% (2/274). Perioperative mortality was 0.7% (2/274). The mean lengths of post-operative hospital stay were 6.1 days. At 1, 3, and 5 years follow-up, freedom from aortic event rate was 96.5%, 90.2%, and 78.6%. Change of aneurysm size was shrinkage in 191 cases (69.7%), no change in 80 cases (29.2%).

Conclusions: Our fifteen year experience of TEVAR for descending thoracic aortic pathologies using our homemade stent-graft confirms that this alternative is a safe, less invasive and low risk approach. Long-term follow-up results suggest that it is effective and durable therapy with low associated mortality and morbidity rates even if with our homemade stent-graft. Growing technical experience and improving stent-graft devices have resulted in better patient outcome and expanded clinical indications.

V7bis-3**CELIAC COVERING IN ENDOVASCULAR THORACIC AORTIC ANEURYSM REPAIR**

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Objectives: Endovascular repair of thoracic and thoraco-abdominal aortic aneurysms has become apparent as an alternative to open repair. To lengthen the proximal landing zone the intended coverage of the left subclavian artery is established and tolerated by most patients. We report our experience with the intended coverage of the celiac trunk.

Methods: All endovascularly treated patients with aortic pathologies were prospectively entered into a computerized database. The patients with intended coverage of the celiac artery were identified and retrospectively analyzed. The evaluation included indication for the coverage of the celiac axis, the visceral arterial collateralization, and the presence of clinical ischemic symptoms after the procedure.

Results: Within a cohort of 111 thoracic aortic stent-grafts between 1998 and January 2008, 8 of the patients (age in median 59 years, min-max 48-68) with thoracic (n=3) or thoracoabdominal aneurysms (n=5), were treated endovascularly with an intended stent-graft coverage of the celiac artery. The electively performed preoperative angiogram with simultaneously balloon occlusion of the celiac trunk demonstrated collateral circulation through the gastroduodenal artery between the celiac and superior mesenteric artery. Three women with a perforated TAA were treated endovascularly with coverage of the celiac artery to lengthen the distal sealing zone. Five patients with TAAA were treated by a combined endovascular and open surgical approach (hybrid procedure) without revascularisation of the celiac axis, but with revascularization of the renals, and the superior mesenteric artery via transperitoneal bypass grafting using the infrarenal aorta or the iliacs as donor vessel. No patient showed type II endoleak at the intraoperative completion angiogram. There were no postoperative deaths, no ischemic abdominal complications, and no clinical spinal cord ischemia. During the follow-up (25 months in median) spiral-CT scanning

revealed sufficient collateral circulation through the superior mesenteric artery.

Conclusions: This limited series supports the suitability of covering the celiac artery, in selected patients. Covering the celiac axis might lengthen the distal sealing zone when poor distal anatomy is present. More over, in thoracoabdominal hybrid procedures the collateral circulation through the superior mesenteric artery might be sufficient. In electively performed procedures we recommend the angiographic evaluation of the visceral collateral circulation.

V7bis-4**ENDOVASCULAR REPAIR OF TRAUMATIC AORTIC RUPTURE: SINGLE CENTER EXPERIENCE WITH ENDOFIT STENTGRAFT**

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Objectives: Traumatic rupture of the thoracic aorta secondary to blunt chest trauma is a life-threatening emergency, usually following violent collisions. The endovascular treatment of such pathologies is a good alternative to open surgery, which is typically associated with high rates of morbidity and mortality. The objective of this study was to evaluate the efficacy of thoracic aortic disruptions treated with the Endofit (Le Maitre, Vascular) stent-graft.

Methods: Twelve male patients (mean age 29.5 years) were admitted to our institution between 2003 and 2007 due to blunt aortic trauma following violent motor vehicle collisions. Plain chest X-ray, spiral computed tomography and aortography were used for diagnosis in all cases. In three cases, transesophageal echocardiography was also available. No preexisting aortic pathology was present. All subjects were poor surgical candidates, due to major concomitant injuries. Eleven repairs were performed using the Endofit stentgraft and one with TAG (GORE).

Results: Technical success was 100%. In one case the deployment of a second cuff at the level of the origin of the left subclavian artery was necessary for exclusion of an endoleak. There were no procedure related deaths. No cardiac, neurological or peripheral vascular complications were noted within the 30 day post operative follow-up period except in one patient who presented Horner syndrome due to subclavian artery transposition. During follow-up (18 months) the patient with TAG stentgraft was converted to hybrid E-vita repair due to stentgraft collapse and pseudoaneurysm formation. All patients are alive with no documented complication

Conclusions: This is the very first time the Endofit graft has been utilized in the treatment of thoracic aortic disruptions secondary to chest trauma. The repair of the disruption is technically feasible and early follow-up results are promising.

V7bis-5**ACUTE BLUNT THORACIC AORTIC INJURY: EXPERIENCE WITH A NEW COMMERCIALLY AVAILABLE STENT-GRAFT**

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Objectives: Open surgery for the treatment of thoracic aortic pathology is still associated with significant morbidity and mortality rates, particularly in emergency pattern. Endovascular repair of the descending thoracic aorta (TEVAR) has been under development for over a decade and only recently has been considered an attractive alternative for the elective treatment of a wide range of pathology along this vascular territory. The use of this technique in emergency is often limited by hemodynamic instability and unavailability of adequate facilities. In this report, we review our experience in treating blunt traumas to the thoracic aorta using the Bolton Relay stent-graft.

Methods: Between November 2006 and December 2007, 7 patients (6 males, mean age 38.7 years, range 21-67 years) underwent emergent TEVAR for traumatic isthmus rupture at our Institution using the Relay Thoracic stent-graft (Bolton Medical Inc., Sunrise, FL). This device is composed of self-expanding sinusoidal nitinol stents that are sutured to a polyester fabric graft. The cause of the injury was a car-crash in four cases, motorcycle accident in two cases and one suicidal fall. All patients were hemodynamically stable at presentation and diagnosis of aortic rupture was confirmed by CT-scan. All the procedures were performed in the operating room, and a portable digital C-arm image intensifier was used.

Results: In all cases one-piece stent-graft was successfully deployed with a primary technical success rate of 100%. No patients required conversion to open thoracic surgical repair. No paraplegia or stroke were observed. Procedure-related complications included an external iliac artery avulsion during removal of a 24-Fr introducer sheath that required emergent laparotomy and ilio-femoral bypass. The left subclavian artery was intentionally covered in three cases, and a left carotid-to-subclavian bypass was performed in two patients prior to stent-graft deployment. Associated abdominal surgical procedures were necessary in three patients; in two of these, the abdominal aorta was used as conduit for thoracic endograft insertion. In the other five patients arterial access was the common femoral artery. One patient died 38 days after the procedure due to multi-organ failure, for a total in-hospital mortality of 14%. At a mean follow-up of 7.2 months, all remaining patients are well with intact device.

Conclusions: In our experience, endovascular treatment of acute traumatic thoracic aortic injury is feasible and appears to be effective in selected cases. The Bolton Relay stent-graft showed to be safe and allowed satisfactory short-term results in this specific group of patients.

V7bis-6

ENDOLEAKS AFTER THORACIC ENDOGRAFTING

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Objectives: This retrospective investigation was performed to review and analyse the incidence and determinants of endoleaks, as well as the outcomes of secondary interventions in patients with endoleaks after thoracic endografting.

Methods: Over a 6-year period, 66 patients (56 males, mean age 62±19 years) underwent thoracic endografting; thoracic aortic diseases included atherosclerotic or dissecting thoracic/thoracoabdominal aneurysms ($n=36$), penetrating ulcers ($n=14$), traumatic injuries ($n=8$), dissection ($n=7$), and mobile thrombus ($n=1$). Twenty-one procedures (31.8%) were carried out in urgent setting. The patients were evaluated for the presence and type of endoleak, aortic expansion, and endoleak intervention.

Results: The mean follow-up in this patient cohort was 31.8±25 months (range 1-72 months). Endoleaks were detected in 12.1% (8/66) of patients, of which 75% (6/8) were type I (4 type B, 2 type A), and 25% were type II. None of the patients had more than one type of endoleak. All but two endoleaks were detected on the initial postoperative computed-tomography angiography at 30 days. Six endoleaks (75%) developed late. Extensive disease or larger aneurysms or aorta at the time of intervention were not statistically different than those without endoleak ($P=NS$). The number of endografts used and proximal landing zones were the only predictive factors for endoleak ($P<0.001$). One patient died for rupture of an undetected proximal type I endoleak. The remainder endoleaks were treated; treatment included total debranching ($n=3$), additional endograft ($n=2$), and coils/plug embolization ($n=2$). All these latter endoleaks were successfully sealed.

Conclusions: Endoleaks are not uncommon after thoracic endografting and mandated careful follow-up program, although most of them may be treated successfully by additional endovascular procedures.

V7bis-7

ENDOVASCULAR REPAIR OF LESIONS INVOLVING THE DESCENDING THORACIC AORTA; MORPHOLOGICAL CHANGES

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Objectives: The thoracic aortic lesions are often life-threatening conditions that carry significant morbidity and mortality with traditional open surgical repair. Preliminary results suggest that endovascular therapy is an effective and advantageous treatment. Long-term effectiveness of this technique remains to be proven.

Methods: Between June 2001 and March 2007, 75 patients underwent endovascular stent-grafting of lesions involving the descending thoracic aorta. Attempted stent-graft deployment was performed emergently in 32 patients. The pathology of electively treated aortic lesions included aneurysms ($n=31$), aortic dissections ($n=8$), and penetrating ulcers ($n=4$). Emergently treated aortic lesions were for acute rupture due to infectious (mycotic) aneurysm ($n=2$), atherosclerotic aneurysms ($n=6$), acute type B

dissections ($n=6$), and acute transactions ($n=18$). Follow-up was performed using magnetic resonance angiography at 1 month, 6 months, 1 year, and annually thereafter.

Results: In three patients, the procedure was terminated due to inadequate vascular calibre. In early outcome, the hospital mortality and morbidity were 8% and 12%, respectively. All mortality was in the acute group of patients. One patient of the chronic group presented a type I endoleak was treated by embolisation. The mean follow-up was 37.5 months. The mortality and the morbidity rates were 10.6% and 10.6%, respectively. The secondary endoleak rate was 16%. One patient died of aortic rupture 24 months after the procedure. The regression of the aneurismal sac was significant in 23 and stable in 28 patients.

Conclusions: Despite encouraging early outcomes, midterm results suggest a trend toward increased re-intervention and late complication rates in these high surgical risk patients. Therefore, continued surveillance of patients treated with stent-grafts is necessary.

V7bis-8

INTENTIONAL COVERAGE OF THE LEFT SUBCLAVIAN ARTERY DURING ENDOVASCULAR STENT-GRAFT REPAIR FOR THORACIC AORTIC DISEASE: LONG-TERM OUTCOMES

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Objectives: Recent EUROSTAR data suggested a high incidence of procedure related strokes in patients having the left subclavian artery (LSA) covered during thoracic aortic stent-graft repair. The aim of this study was to examine outcomes following coverage of the LSA origin during stent graft repair in a single centre.

Methods: From May 2001 to January 2008, 47 patients (27 emergencies, 20 elective) underwent endovascular repair for thoracic aortic disease. Pathology included 15 traumatic aortic injuries, 15 type B dissections, 13 thoracic aortic aneurysms, 2 aortic coarctations, 1 aorto-oesophageal fistula and 1 tracheo-aortic fistula. Thirty-two were male and mean age was 59.2 years (range 16-84). Mean follow-up was 642 days (range 10-2356).

Results: 27/47 (57%) patients had LSA coverage including one who required pre-procedural left carotid-subclavian bypass due to the presence of a left internal mammary bypass graft in situ. Of these, one patient with left hand dominance developed steal symptoms on exertion requiring post-procedural LSA to carotid transposition. A further 5/27 patients reported occasional left arm discoloration and paraesthesia but without significant claudication. No strokes were reported in this group. Total 30-day mortality was 4/47 (8.5%), 1 secondary to a myocardial infarct, 1 carotid territory stroke, 1 brainstem infarct and 1 multi-organ failure. There was 1 late (72 days) death secondary to patient co-morbidities.

Conclusions: In our experience LSA coverage can be performed safely without pre-emptive carotid-subclavian bypass during thoracic aortic stenting.

V7bis-9

EMERGENCY ENDOVASCULAR REPAIR IN ACUTE THORACIC AORTIC PATHOLOGY

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Objectives: Preliminary results suggest that stent-grafting is an attractive alternative to conventional open surgery for treatment of acute thoracic aortic pathology. The aim of this study was to report single-center prospective results of emergency endovascular treatment of acute thoracic aortic disease ruling out degenerative/atherosclerotic aneurysms.

Methods: From April 2005 to June 2007 data from patients with acute thoracic aortic pathology treated in our department with an endovascular procedure were prospectively collected. Diagnosis and localization of the aortic lesions were confirmed by contrast-enhanced CT scan. Stent-grafts (Talent, Valiant, Medtronic) were placed via a femoral or iliac access route. The procedure was considered to have succeeded in case of complete aortic wall tear occlusion. CT scan follow-up was obtained before discharge and every six months after the procedure.

Results: During the 2-year study period 24 patients (male 15, female 9, mean age 42 years) were treated. Pathology of aortic lesions included traumatic aortic transactions ($n=10$), symptomatic penetrating ulcers ($n=10$),

traumatic intramural hematomas ($n=2$) and acute Type B dissections ($n=2$). Two patients died before treatment could be initiated. In four patients a combined prior bypass of the left supra-aortic arteries was performed. The stent-graft was successfully delivered in all 22 patients. There were no procedure related deaths. One patient (4.5%) admitted for aortic transection died of other co-existing injuries. One patient presented deterioration of a preexisting renal failure. There were no cases of paresis or paraplegia. Mean follow-up was 12.4 months (6-30). CT scan follow-up did not reveal evidence of endoleak, stent migration, collapse or pseudoaneurysm formation.

Conclusions: Stent-grafting with commercially available devices for the treatment of acute thoracic aortic pathology (ruling out degenerative/atherosclerotic aneurysms) is technically feasible and can be performed in emergency with low rates of morbidity and mortality.

V7bis-10

PEARLS AND PITFALLS OF STENT-GRAFTING OF THE THORACIC AORTA IN A CARDIOVASCULAR SURGERY DEPARTMENT

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Objectives: To report the lessons learned in stent-grafting of the thoracic aorta (SGTA) during the last ten years of experience.

Methods: Since 1997, 51 patients (7 women, age 69-year-old, range 17-88) required SGTA. Nineteen acute aortic syndrome, 10 transections, 22 chronic type B/atherosclerotic aneurysms. Cerebrospinal fluid drainage was performed in patients requiring a long graft or associated abdominal aneurysm. Patients were followed yearly by multislice CT.

Results: Ten patients required overlapping of two or more SGs. Early mortality was 1.9% ($n=1$, acute type B dissection with malperfusion syndrome). Transient paraparesis occurred in one patient. Stroke rate was 0%. Seven patients (13.72%) required iliac or abdominal aortic insertion, four suffered vascular complications. Groin infections occurred in three patients. Six (11.76%) patients required left subclavian artery occlusion (without symptoms), three required humeral traction and four required visceral or renal stenting. Two early endoleaks (1 resolved) and two late endoleaks (2 reinterventions, 1 resolved) are reported. Overall, false lumen flow at abdominal level persisted in 56% of patients with aortic dissection.

Conclusions: SGTA may be performed with a very low neurologic complication rate, but vascular complications and reinterventions are not uncommon. Complete obliteration of the false lumen at the abdominal level is often not achieved with thoracic stenting alone.

April 26th, 2008 3rd Congress Day

14:30-16:00

8th Vascular Scientific Session - Vascular Research

V8-1

IN VIVO REGENERATION OF SMALL-DIAMETER (2 MM) ARTERIES USING A POLYMER SCAFFOLD

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Objectives: The difficulty of obtaining significant long-term patency and good wall mechanical strength in vivo has been a significant obstacle in achieving small-diameter vascular prostheses. To reproduce and positively guide the formation of a new artery in vivo, we searched a biomaterial functioning only as temporary absorbable guide to promote the sequential and complete regeneration of vascular structures at the implantation site. The aim of the present study was to develop a prosthetic graft that could perform as a small-diameter vascular conduit.

Methods: Tubular structures of hyaluronan (HYAFF-11 tubules, 2 mm diameter, 2 cm length) were grafted in the abdominal aorta of 30 rats as temporary absorbable guides to promote regeneration of vascular structures.

Histological, immunohistochemical and electron microscopic analysis were used to evaluate the results at 5, 15, 30, 60 and 120 days.

Results: At day 5, a new tissue is observed on the graft coming from both proximal and distal end of the aorta. The luminal surface of the regenerating tissue is covered by endothelial cells (CD34+, VEGFR-2+, vWF+). At day 15, regenerating tissues from distal and proximal ends joint at the centre of the tube. Beside the endothelial layer, the neo-vessel is formed by smooth muscle cells as well as elastic, and collagen fibres. At day 120, the regeneration and remodelling processes is complete, ending in a stable neo-artery segment. The biomaterial is totally degraded and an adventitia-like tissue surrounds the new vessel. Infiltration of neutrophils and lymphocytes was never observed at the different time points. The survival and patency rate was 100% and signs of insufficient vascular perfusion were never observed in the hindlimbs.

Conclusions: These experiments resulted in three novel findings: 1) complete endothelialization of the tube's luminal surface occurred; 2) sequential regeneration of vascular components led to vascular wall regeneration 15 days after surgery; and 3) the biomaterial used created the ideal environment for the delicate regeneration process during the critical initial phases, yet its biodegradability allowed for complete degradation of the construct four months after implantation, at which time, a new artery remained to connect the artery stumps. This study assesses the feasibility to create a completely biodegradable vascular regeneration guide in vivo, able to sequentially orchestrate vascular regeneration events needed for very small artery reconstruction.

V8-2

SERUM PROTEINS ASSOCIATED WITH EXPANSION OF ABDOMINAL AORTIC ANEURYSMS IDENTIFIED BY PROTEOMIC ANALYSIS

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Objectives: Aneurysms of abdominal aorta (AAA) are usually asymptomatic until they reach a large size where they may rupture. Identification of new predictors of the expansion of small AAA might give us further morphological insight and a more nuanced indication for surgery.

Methods: We have applied two-dimensional gel electrophoresis (2D PAGE) followed by mass spectrometry (MS) and database search to identify proteins in patients with different AAA expansion rate. We hypothesized that these proteins might be involved in AAA development, progression and rupture. Sera from 15 cases of asymptomatic AAA were used. These cases had undergone surveillance in the Viborg Aneurysm Screening Study, and referred to surgery because of expansion to above 5 cm in maximal diameter. Mean annual expansion rate was calculated. Samples were analyzed for protein composition by 2D PAGE. Analysis of protein spots was performed using Melanie II analysis software. Spot intensities were expressed as relative volumes in percentage (%VOL) by integrating the optical density in the spot area (VOL) and dividing with the sum of volumes of all spots detected in the gel. These data were exported to Excel for further statistical analysis. Correlation was calculated using SPSS 10.0 statistical package for Windows and non-parametric Spearman correlation coefficient was used. Comparisons were made, $P<0.05$ was considered statistically significant. Only well focused spots were considered. Protein spots that showed significant correlation were excised from the gel and subjected to in-gel tryptic digestion for identification by tandem MS.

Results: Fifteen protein spots in AAA showed strong positive or negative correlation with AAA expansion rate. Twelve proteins spots were identified. A significant positive and negative correlation were found concerning Albumin; in two spots ($r=0.82$, $P=0.004$) and in four spots ($r=-0.8$, $P=0.005$). Six proteins in nine spots were identified; significant negative correlations were found concerning Antithrombin III ($r=-0.77$, $P=0.009$), Ig alpha-2 chain C region ($r=-0.76$, $P=0.01$), Fibrinogen gamma ($r=-0.65$, $P=0.042$), Hemoglobin B ($r=-0.606$, $P=0.042$), Alfa 2-HS glycoprotein ($r=-0.73$, $P=0.004$) and in two spots Haptoglobin 1 ($r=-0.648$, $P=0.043$ and $r=-0.640$, $P=0.046$).

Conclusions: AAA expansion rate was significantly correlated to changes in amounts of a set of proteins in the sera which may be related to relationships between blood coagulation and the fibrinolysis system and morphology of AAA.

V8-3

TRANSVENOUS TREHALOSE ADMINISTRATION REDUCES PARAPLEGIA DUE TO SPINAL CORD INJURY DURING AORTIC SURGERY IN RABBIT

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Objectives: Trehalose, a nonreducing disaccharide, has been shown to be effective in protecting cells various stress, and used for lung preservation during ischemia in transplantation clinically. We examined the protective effect of trehalose against ischemic spinal cord injury.

Methods: Fourteen rabbits were divided into two groups ($n=7$ each group). The infrarenal aorta was isolated proximally and distally by vascular clamps for 20 min. In group I, lactated Ringers solution was administered intravenously for two hours at 2.0 ml/min from 30 min before clamping, and infused into isolated aortic segment at 2.5 ml/min during clamping. In group II, 5% trehalose with lactated Ringers solution was administered intravenously like group I. Eight, 24 and 48 h after reperfusion, the hind limb function was estimated with the Tarlov score. Then, histopathological study was also done by the light and transmission electron microscopy.

Results: At 48 h after reperfusion, the Tarlov scores in group I and II were 0.7 ± 0.8 and 2.6 ± 1.0 (mean \pm S.D.), respectively. In the light microscopy, the number of normal motor neurons in the anterior horn of the spinal cord was 5.8 ± 2.6 and 16.0 ± 3.0 at 48 h after reperfusion, respectively, for groups I and II. The number of normal neurons in group II was significantly greater than that in group I ($P=0.0009$). The rabbits in group II were protected from acute and delayed paraplegia. Transmission electron microscopic showed that a part of cell membranes of neuronal cells was broken and mitochondria were swelling and disruption in group I. On the other hand, cell membranes and cytoplasmic components were protected within small damage in group II. These findings support the cytoprotective effect of trehalose.

Conclusions: Intravenous trehalose administration before and during aortic segmental clamping can reduce ischemic spinal cord injury. It is one of the mechanism of trehalose against spinal cord injury to protect cell membrane. This method will be performed safely as an adjunct to thoracoabdominal aortic surgery.

V8-4

CONCENTRATION AND ACTIVITY OF MATRIX METALLOPROTEINASES AND TISSUE INHIBITORS OF MATRIX METALLOPROTEINASES IN THE WALL OF ABDOMINAL AORTIC ANEURYSM AT DIFFERENT WALL STRESS

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Objectives: AAA formation and development occur due to excessive extracellular matrix degradation which is closely regulated by matrix metalloproteinases (MMPs) and their inhibitors (TIMPs). It is suggested that variation in wall stresses may be influential in this regulation. We aimed to assess the impact of high and low wall stress on MMPs and TIMPs and to compare this with controls.

Methods: We recruited 22 patients undergoing elective AAA repair and eight patients undergoing (CABG) as controls. A 3D CT reconstruction of AAA was performed and analysed using FEA for wall stress calculation, where samples were taken. Ascending thoracic aorta samples obtained during CABG were used as controls. All samples were snap frozen and analysed for MMP 2, 8 and 9 and TIMP 1 and 2 using ELISA. Statistical analysis was performed using SPSS v14.

Results: All results are in median and IQ range. High wall stress Low wall stress. Control MMP 8 active 5.8 (2.6-9.9) 6.3 (3.8-10.8) 3.5 (2.6-5.0). MMP 8 total 14.2 (8.9-43.6)* 13.3 (9.2-31.0)* 6.3 (3.2-13.4). MMP 8 active/total 0.38 (0.20-0.54) 0.35 (0.28-0.56) 0.71 (0.50-0.93). MMP 9 active 0.4 (0.29-1.39)* 0.6 (0.29-0.86)* 14.8 (7.2-18.1). MMP 9 total 8.1 (3.6-16.1)* 8.3 (5.0-11.6)* 25 (19.0-61.0). MMP 9 active/total 0.05 (0.04-0.12)* 0.06 (0.04-0.14)* 0.41 (0.16-0.65). TIMP 1 296 (164-522)* 176 (82-321) 130 (83-221). TIMP 2 25 (11-45)* 18 (10-33)* 174 (134-232). * $P<0.05$ compare to control.

Conclusions: Concentrations and activities of MMPs and TIMPs in the wall of AAA may be influence by variation in wall stress.

V8-5

POPULAR CEREBROPROTECTORS LIMIT NO-DEPENDANT DAMAGE OF BRAIN NEURONS WITH ISCHEMIA-REPERFUSION TO DIFFERENT DEGREE DURING CAROTID ARTERIES OPERATION

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Objectives: The present study was designed to compare efficiency of four the most used medicines for protection of brain in vascular surgery against of NO-dependant damage of neurons caused by experimental ischemia-reperfusion to outline the possibility of broadening of therapeutic period in ischemic stroke.

Methods: The experiments were carried out on rats weighed. The experimental animals were divided into four groups, we used preparations (Cytoflavin, Actovegin, Mexidol, Enoxifol) thirty min before occlusion of common carotid arteries for 24 h. In traditional neurohistological study we dyed brain tissues by hematoxiline-eosine, Nissl for each tenth histologic section. Morphometrical study was carried out using image autoanalyzer Videotest-Morpho (Saint-Petersburg, Russia). To evaluate the condition of neurons we used semiquantitative analysis of damage degree (%). Immunohistochemical study was carried out using monoclonal antibodies (DakoCytomation, Denmark): against neuronal Nitric Oxide Synthase (NOS-1); endothelial Nitric Oxide Synthase (NOS-3); ligand TNF-dependant apoptosis (TRAIL) and caspase-3. Visualization was carried out using indirect immunoperoxidase method. NOS-1 content was evaluated by means of division of neurons into subclasses depending on the degree of expression of immunopositive material according to transmission density of masks: negative, slightly positive, positive and hyperexpressive. The ratio of expressions of NOS-1/NOS-3 was identified through specific brightness of comparable sections processed on the same object-plate.

Results: Brain ischemia-reperfusion was accompanied by reduction of volumetric part of neurons and considerable degree of their injury, moderate glial reaction. Maximal changes were typical of front zones of cerebral cortex and medulla oblongata. Considerable increase of cytoprotective effect is evident amongst Actovegin < Mexidol < Enoxifol < Cytoflavin. Coefficient glia/neuron indicated apparent protective properties of Mexidol further decreasing from Actovegin to Cytoflavin and Enoxifol. According to restriction of expression of ligand TNF-dependant apoptosis and expression of caspase-3 the leaders were Cytoflavin and Actovegin further in decreasing order of the effect there were Enoxifol and Mexidol. The least expression of NOS-1 in cells was observed in protection with Enoxifol, then Actovegin and Cytoflavin. NOS-1 content in tissues of Mexidol group animals is practically the same as in control group. NOS-3 content can be shown by the following row Cytoflavin < Mexidol < Enoxifol < Actovegin < control group.

Conclusions: Cerebroprotectors (Cytoflavin, Actovegin, Mexidol, Enoxifol) have different capacity for restriction of ischemic/reperfusion brain neuron damage. It is concerned with their various power of blocking of TNF-dependant apoptosis activation. According to it the most efficient neuroprotectors in cerebrovascular operations are Enoxifol and Cytoflavin.

V8-6

THE EFFECT OF N-NITRO-L-ARGININE METHYL ESTER AND L-ARGININE ON LUNG INJURY INDUCED BY ABDOMINAL AORTIC OCCLUSION-REPERFUSION

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Objectives: N-nitro-L-arginine methyl ester (L-NAME) is a nitric oxide (NO) synthase inhibitor whereas L-arginine is a NO precursor. The aim of the study was to examine the effects of L-NAME and L-arginine on lung injury after aortic ischemia-reperfusion (IR).

Methods: Twenty-four Wistar-Albino rats were randomized into four groups ($n=6$) as follows; Control (sham laparotomy), Aortic IR (30 min ischemia and 120 min reperfusion), L-arginine (intraperitoneal 100 mg kg⁻¹ live weight) +aortic IR, and L-NAME (intraperitoneal 10 mg kg⁻¹ live weight)+aortic IR. In lung specimens, tissue levels of malondialdehyde (MDA), Vascular Endothelial Growth Factor (VEGF) and nitric oxide (NO) were measured and histological examination was done.

Results: MDA and VEGF levels ($P<0.05$ vs. control group), and NO level ($P>0.05$ vs. control group) increased after aortic IR. L-arginine further significantly increased MDA and NO levels, and decreased VEGF level ($P<0.05$ vs. aortic IR group). L-NAME significantly decreased the MDA and NO levels ($P<0.05$ vs. L-arginine+aortic IR group) and increased VEGF level ($P<0.05$ vs. other groups). Histological examination ($n=6$ each group) showed that the aortic IR significantly increased pulmonary leukocyte infiltration ($P<0.05$

vs. control group). Pretreatment with L-arginine caused a further increase ($P < 0.05$ vs. aortic IR group) whereas pretreatment with L-NAME caused a significant decrease in pulmonary leukocyte infiltration ($P < 0.05$ vs. aortic IR group).

Conclusions: Our results indicate that L-arginine aggravates the lung injury induced by aortic IR while L-NAME attenuates it.

V8-7

THE ROLE OF ADHESION MOLECULES IN THE PROTECTIVE EFFECT OF ILOPROST AGAINST THE RENAL INJURY INDUCED BY ABDOMINAL AORTIC-ISCHEMIA-REPERFUSION IN RATS

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Objectives: The aim of this study was to examine the role of adhesion molecules in the effect of iloprost on renal injury induced by abdominal aortic ischemia-reperfusion (IR).

Methods: Twenty-four Wistar-Albino rats were randomized into three groups ($n=8$). The control group underwent laparotomy and dissection of the infrarenal abdominal aorta without occlusion. The aortic IR group underwent clamping of the infrarenal abdominal aorta for 120 min followed by 120 min of reperfusion. The aortic IR + iloprost group underwent the same aortic IR periods and was pretreated with 0.45 $\mu\text{g}/\text{kg}/\text{h}$ of intravenous infusion of iloprost during 120 min reperfusion. At the end of experiment, the blood and renal tissue samples were obtained for biochemical analysis. A histological evaluation was done with both Hematoxylin-Eosin staining and immunostaining.

Results: The biochemical analysis showed that, aortic AIR significantly increased ($P < 0.05$ vs. control), whereas iloprost significantly decreased ($P < 0.05$ vs. AIR) the plasma levels of malondialdehyde (MDA), P-selectin, intercellular adhesion molecule-1 (ICAM-1) and the tissue levels of MDA and catalase. The histological evaluation with Hematoxylin-Eosin staining showed that, in the aortic IR group, the dilatation of Bowmans capsule, degeneration of tubular epithelium, necrosis in tubular epithelium, tubular dilatation, interstitial inflammatory infiltration and congestion of blood vessels were significantly higher than those in the control group ($P < 0.05$). Iloprost significantly decreased the degeneration of tubular epithelium, necrosis in tubular epithelium, interstitial inflammatory infiltration and congestion of blood vessels ($P < 0.05$ vs. aortic IR). The histological evaluation with immunostaining showed that, aortic IR significantly increased ($P < 0.05$ vs. control), whereas iloprost significantly decreased ($P < 0.05$ vs. AIR) the immunoreactivity of P-selectin, tumor necrosis factor, CD11b, CD18 and ICAM-1 both in the glomerulus and interstitium.

Conclusions: These results show that, iloprost attenuates renal injury induced by aortic IR. We think that decrement of aortic IR-induced local and systemic expression of adhesion molecules may be the key mechanism in this beneficial effect of iloprost.

V8-8

INTERMITTANT INFRARENAL ENDOCLAMPING IMPROVES RENAL BLOOD FLOW. AN EXPERIMENTAL PIG STUDY

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Objectives: Circulatory instability often requires drug therapy at the expense of reduced perfusion of the arterial vessels especially of the abdominal organs. We tested if temporary balloon occlusion of the infrarenal aorta allows instant and reversible increase of blood pressure and/or perfusion in the renal and suprarenal arterial system.

Methods: In seven German landrace pigs (73 ± 6 kg) flow probes were fitted around the left renal artery and at the descending aorta. A balloon sheath was placed via the femoral artery into the infrarenal aorta. A period of 20 min of infrarenal endoclamping was followed by 10 min of unclamped reperfusion. This cycle was repeated four times. The renal and aortic flow as well as the suprarenal arterial pressure were monitored online. Parameters were compared with starting measurements.

Results: The flow in the left renal artery increased cascade like (1. clamping 129% 1. reperfusion 108%; 2. 144 to 128%; 3. 151 to 138%; 4. 156 to 152%). The suprarenal mean arterial pressure rose after clamping and dropped after

declamping to the initial level (1. clamping 130% 1. reperfusion 100%; 2. 137 to 100%; 3. 139 to 109%; 4. 146 to 109%). The flow in the descending aorta slightly increased (1. clamping 81% first reperfusion 114% 4. 93 to 115%).

Conclusions: This study could demonstrate a cascade like increase of the renal blood flow and reproducible increase of blood pressure after a cycle of clamping and declamping of the infrarenal aorta. This balloon sheath could be a tool in therapy of patients with circulatory instability and might reduce renal insufficiency in these patients.

V8-9

ADHESION MOLECULES AND THE ATTENUATING EFFECT OF ILOPROST IN AORTIC ISCHEMIA-REPERFUSION-INDUCED FEMORAL ARTERY ENDOTHELIUM INJURY IN RATS

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Objectives: We aimed to examine the effect of iloprost on aortic-ischemia-reperfusion (AIR) induced femoral artery endothelium injury in rats.

Methods: Twenty four Wistar-Albino rats were randomized into three groups (eight per group). Control group underwent laparotomy and dissection of the infrarenal abdominal aorta (IAA) without occlusion. AIR group underwent laparotomy and clamping of the IAA for 120 min followed by 120 min of reperfusion. AIR+iloprost group received 0.45 $\mu\text{g}/\text{kg}/\text{h}$ iloprost by constant intravenous infusion via tail vein during 120 min of reperfusion. Blood and femoral artery tissue samples were obtained for biochemical and histopathological analysis from all rats, respectively.

Results: Biochemical analysis showed that, in the AIR group, plasma levels of malondialdehyde, P-selectin, vascular cell adhesion molecule (VCAM-1) and intercellular adhesion molecule-1 (ICAM-1) were significantly higher than in the control group ($P < 0.05$). In the AIR+iloprost group, plasma levels of malondialdehyde, P-selectin and ICAM-1 were significantly lower than in the AIR group ($P < 0.05$). Histopathological examination showed that, in the AIR group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor-alpha, CD11b, CD18, ICAM-1 and cyclooxygenase-2 were significantly higher than in the control group ($P < 0.05$). In the AIR+iloprost group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor-, alpha, CD11b, ICAM-1 and cyclooxygenase-2 were significantly lower than in the AIR group ($P < 0.05$).

Conclusions: The results show that, iloprost attenuates AIR induced femoral artery endothelium injury in rats. We think that this beneficial effect of iloprost may be primarily due to down-regulation of expression of adhesion molecules after AIR.

April 26th, 2008 3rd Congress Day

16:30-18:00

14th Cardiac Scientific Session - Cardiac General

C14-1

MITRAL VALVULAR DISEASE IN OCTOGENARIANS: CAN SURGERY IMPROVE THE QUALITY OF LIFE?

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Objectives: Increasing numbers of octogenarians are now referred for mitral valve operations. It has been unclear whether the results offset the risk of intervention and which is the impact of surgery on quality of life in this population.

Methods: Fifty-five consecutive octogenarians (median age 81 years, range 80-87 years) undergoing mitral valve surgery between January 1998 and December 2006 was retrospectively reviewed. Clinical follow-up was integrated with a modified Seattle Angina Questionnaire to assess the quality of life.

Results: Seventeen patients (30.9%) were male. Mitral valve disease aetiology was degenerative disease in 21 (38.1%) cases, ischemic mitral regurgita-

tion in 13 (23.6%), functional mitral regurgitation in 10 (18.2%), rheumatic mitral disease in 4 (7.3%), mitral annular and/or leaflet calcification in 4 (7.3%), and other in 3 (5.5%). Twenty-five (45.5%) patients were in New York Heart Association functional class III-IV, and 9 (16.4%) had a left ventricular ejection fraction <50%. Isolated mitral valve repair and replacement were performed in 14 (25.5%) and 7 (12.7%) patients, respectively. Concomitant procedures were performed in 34 (61.8%) cases. In-hospital mortality occurred in 3 patients (5.5%), with previous cardiac surgery ($P=0.025$) and preoperative diagnosis of unstable angina ($P=0.044$) as independent risk factors on multivariate analysis. Follow-up was complete in all the 42 survivors (mean length 36.9 ± 27 months, range 0.4-112.7 months). Kaplan-Meier survival rates at 2-year and 6-year were $78.7 \pm 5.7\%$ and $71.3 \pm 7.4\%$, respectively. Late death occurred in 10 patients with a cardiac cause in two cases. Reparative techniques did not result in a survival advantage compared with replacement. Freedom from cardiac events (reoperation, cardiac-related re-hospitalization, and percutaneous cardiologic procedure) at 5-year was $80.2 \pm 6.5\%$. Quality of life was remarkable in all the patients. Thirty-six patients (85.7%) were not or little disabled in their daily activity. Thirty-nine patients (93%) were free or considerably less symptomatic with a New York Heart Association functional class I-II. Forty-one patients (97.6%) reported to be satisfied or very satisfied about the treatment of their heart disease, as well as 36 (85.7%) patients declared to be satisfied or very satisfied about their current quality of life.

Conclusions: Mitral valve surgery in octogenarians can be performed with tolerable operative risk. The possibility to improve the functional status and to obtain a full treatment satisfaction of the patients, together with a satisfactory long-term survival give good reasons to perform surgery in this high-risk subset of patients.

C14-2

BLOOD BANK REQUIREMENTS IN CARDIAC SURGERY: 15 YEARS EXPERIENCE OF A SINGLE CARDIAC SURGERY CENTER

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Objective: The quantity of blood products used perioperatively during cardiac surgery seems to vary widely between institutions and this is based on individual preferences and blood product availability. There is little previously published work identifying blood transfusion requirements in patients undergoing cardiac operations. This study looked at the amount of blood products used perioperatively in all elective cardiac operations during 15 years in Onassis Cardiac Surgery Center.

Methods: From July 1993 to August 2007, 23496 consecutive patients underwent cardiac surgical procedures in Onassis Cardiac Surgery Center. Twenty thousand two hundred and seventy-three were adults (15793 males, 4480 females, M/F: 3.5/1) and 3223 were children (<14-years-old). We recorded the number of units of concentrated Red Blood Cells (RBCs), fresh frozen plasmas (FFPs), platelets from multiple donors (PLTs) and platelets from single donors (SDPs), transfused during hospitalization. Besides, we defined as Group A all patients that underwent single cardiac operation procedures (e.g. CABG, AVR, MVR, etc) and Group B those who underwent complex operation (>1 procedures/operation).

Results: In total, our patients were transfused with: 92197 units of RBCs; 81745 units of FFPs; 26611 units of PLTs; 2226 units of SDPs. Adults were totally transfused with 79485 RBCs (3.9/patient), 70277 FFPs (3.5/patient), 23027 PLTs (1.1/patient) and 2160 SDPs (0.1/patient), while children received 12712 RBCs (3.9/patient), 11468 FFPs (3.6/patient), 3584 PLTs (1.1/patient) 66 SDPs (0.02/patient). There were no significant differences in transfusion requirements between adults and children and also between males and females. The average RBC transfusion requirements seemed to differ between Group A and B (A: 3.3RBCs/patient vs. B: 4.6RBCs/patient). Finally, the average RBC requirements in patients <75-year-old were less than in patients >75-year-old and this remark was statistically significant.

Conclusions: The Blood Bank Transfusion Department of Onassis Cardiac Surgery Center supports the transfusion of cardiac surgery patients in a level of a Blood Bank Center. Understanding risk factors for transfusion requirements of those patients should optimize present resources. Reduction of homologous blood transfusions results in a decreased risk of transfusion-transmitted infections, takes best advantage of manpower within the blood bank and minimizes unnecessary and avoidable blood wastage and expenditure. In our Center-as in all developed countries- the transfusion requirements has drastically declined in recent years. The continuous improvement of surgical and anaesthesiological handlings, the use of SDPs,

the strict criteria of transfusion, as well as the hemostatic vigilance that our Blood Bank-Hematology-Hemostasis Department ensures, all contribute to the decline of blood product use.

C14-3

LONG-TERM IMPACT OF METABOLIC SYNDROME ON PATIENTS UNDERGOING ISOLATED CORONARY ARTERY BYPASS GRAFTING

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Objectives: Metabolic syndrome (MS) increases the risk of coronary artery disease and is thought to affect the operative outcome of coronary artery bypass grafting (CABG). We evaluated the impact of MS on early and late clinical outcomes after CABG.

Methods: The subjects of this study were 439 patients who underwent isolated CABG between 1985 and 2005. The diagnosis of MS was based on the Japanese criteria in 2005 as follows: central obesity (essential criterion), with at least two of fasting hyperglycemia, hypertension, or dyslipidemia. We regarded a body mass index 25 kg/cm^2 as central obesity in this study. Patients were divided into an MS group and a non-MS group, preoperatively, and the early and long-term clinical outcomes after CABG were compared. Results: MS was diagnosed preoperatively in 96 (21.9%) patients. The incidence of hypertension and dyslipidemia was significantly higher in the MS group ($P<0.0001$), and the patients were younger. There was one (1.0%) early postoperative death in the MS group and eight (2.3%) in the non-MS group ($P=0.69$; 2 test.) The 5- and 10-year cumulative survival rates were 89.8% and 85.3% vs. 84.9% and 69.6% in the MS and non-MS groups, respectively ($P=0.14$; log rank test), without significance. Older age ($P=0.0006$), lower BMI ($P=0.026$), and preoperative renal dysfunction ($P=0.0002$) were independent risk factors of mortality. The 5- and 10-year cardiac event-free rates were 96.0% and 96.0% vs. 95.8% and 90.2% in the MS and non-MS groups ($P=0.60$), respectively. Multivariate analysis revealed diabetes mellitus as the only independent risk factor of a cardiac event.

Conclusions: MS did not affect the risk of early and late mortality in patients undergoing CABG. Preoperative renal dysfunction and older age were associated with late mortality after CABG. Diabetes mellitus was an independent predictor of postoperative cardiac events after CABG.

C14-4

A PRELIMINARY STUDY OF INTEGUSEAL USE IN PATIENTS UNDERGOING CARDIAC SURGERY TO PREVENT SURGICAL SITE INFECTIONS

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Objectives: Surgical site infection is a serious complication after cardiac surgery with high mortality. This study was performed to evaluate InteguSeal in preventing surgical site infection in patients undergoing cardiac surgery.

Methods: Between March and November 2007, 910 patients underwent cardiac surgery at our institute. Standard institutional preoperative preparation was performed in 721 patients (control group) whether 189 patients received additionally a microbial sealant (InteguSeal group). Both groups were compared after evaluating pre-operative and combined risk scores. A higher risk score predicts a higher risk to develop a surgical site infection. End-point of this study was freedom of surgical site infection at 60 days follow-up.

Results: Follow-up was 100% completed. The values of the pre-operative risk factor was $8.0 \pm 3.8\%$ and $10.0 \pm 1.5\%$ ($P<0.001$) for, respectively, the control group and the InteguSeal group. The values of the combined risk factor were $7.1 \pm 3.2\%$ and $9.1 \pm 1.0\%$ ($P<0.001$) for respectively, the control group and the InteguSeal group. The clinical end-point, however, showed 1.1% ($n=2$) of surgical site infection in the InteguSeal group whether 4.6% ($n=33$) in the control group, which was significant ($P<0.025$). Two patients of the control group died due to surgical site infection.

Conclusions: Early results show a significant reduction of surgical site infections by the use of a microbial sealant.

C14-5

IS THERE A REAL CLINICAL ADVANTAGE IN THE MECC SYSTEM OR JUST LESS INFLAMMATORY RESPONSE MARKERS?

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Objectives: The aim of this prospective study was to compare the perioperative clinical parameters between minimal extracorporeal circulation (MECC) and conventional extracorporeal circulation.

Methods: In 69 patients, ($n=49$ (randomised), mean age 69 years (43-81 years)) (group I) coronary revascularisation utilizing the MECC system was performed. These patients were matched with the conventional perfusion method (group II, $n=20$), (mean age 70 (50-82 years)). In both groups patients with single CAD as well as emergency patients were excluded.

Results: There were no statistical differences in mean aortic clamping time (62+18.2 min vs. 64.2+12.5 min), mean extracorporeal perfusion time (106+29 min vs. 115+29.44 min) and in the mean number of distal anastomoses, as well as in levels of creatinine, CK, CK-MB, thrombocytes, leukocytes, haemoglobine, hematocrite measured after 6, 24, 48 h postoperatively. There was no 30-day mortality in both groups and no differences in ICU stay. There were statistically significant differences in amounts of donor blood units during the first 10 days postoperatively (0.58 vs. 1.00), amount of cell saver blood (254 vs. 323.40), ACT (136.07 vs. 129.80), lactate (intraoperative 0.9 vs. 1.42, 24 h postoperative 1.19 vs. 1.49, 48 h postoperative 1.38 vs. 1.43).

Conclusions: Some laboratory parameters and optimized perfusion show the benefit of the MECC system correlating with less inflammatory response markers known from the literature. The subjective visual benefit of MECC patients is evident, however, a conclusive parameter is absent.

C14-6

TEMPORARY CAVAL STENTING IMPROVES VENOUS DRAINAGE DURING CARDIOPULMONARY BYPASS

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Objectives: Assess the benefit of temporary caval stenting for remote venous drainage during cardiopulmonary bypass (CPB)

Methods: Temporary caval stenting was realized in bovine experiments (65±6 kg) by the means of self-expanding (18F for insertion, 36F in situ) venous cannulas (Smartcannula LLC, Lausanne, Switzerland) with various lengths: 43 cm, 53 cm, 63 cm vs. a standard 28F wire armed cannula in trans-jugular fashion. Maximal blood flows were assessed for 20, 25 and 30 mmHg of driving pressure with a motorized table height adjustment system. In addition, the inferior caval diameters (just above its bifurcation) were measured in real time with intra-vascular ultrasound: IVUS.

Results: Venous drainage (flow in l/min) at 20 mmHg, 25 mmHg, and 30 mmHg drainage load was 3.5±0.5, 3.7±0.7, and 4.0±0.6 for the 28F standard vs. 4.1±0.7, 4.0±1.3, and 3.9±1.1 for the 36F smart 43 cm, vs. 5.0±0.7, 5.3±1.3, and 5.4±1.4 for the 36F smart 53 cm, vs. 5.2±0.5*, 5.6±1.1*, and 5.8±1.0* for the 36F smart 63 cm. The inferior vena caval diameters at 30 mmHg were 13.5±4.8 mm for 28F standard, 11.1±3.6 36F smart 43 cm, 11.3±3.2 for 36F 53 cm, and 17.0±0.1* for 36F 63 cm (* $P<0.05$ for 28F standard vs. 36F smart 63 cm long)

Conclusions: The 43 cm self-expanding 36F smartcannula® outperforms the 28F standard wire armed cannula at low drainage pressures and without augmentation. Temporary caval stenting with long self-expanding venous cannulas provides even better drainage (+51%).

C14-7

DEEP SURGICAL SITE INFECTION DUE TO METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS: IMPACT OF DAPTOMYCIN

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Objectives: The incidence of antibiotic resistance of common bacteria is attributed in part to the widespread use of various antibiotic agents. A major cause of surgical site infection in cardiac surgery became methicillin-resistant Staphylococcus aureus. We report about our experience using Daptomycin in patients suffering from methicillin-resistant Staphylococcus aureus mediastinitis.

Methods: Between September 2006 and June 2007, four patients (0.3%) suffered from deep surgical site infection due to methicillin-resistant staphylococcus aureus. The median age was 73.5 years (range 71-77 years) and median logistic EuroSCORE was 26.7% (range 5.3-56.9%). The pre-operative and combined risk scores for surgical site infection were respectively, 14.5% and 12.8% in these patients. Patients were followed for wound healing, wound closure, freedom of methicillin-resistant Staphylococcus aureus and survival.

Results: Follow up was 100% completed. Early extensive wound debridement was performed. Additionally, the patients wounds were treated with vacuum assisted closure therapy until the wounds showed good granulation. Antibiotic supported was provide by Daptomycin (6 mg/kg) intravenously submission. At the time of secondary sternum closure, wound swaps showed freedom of methicillin-resistant staphylococcus aureus. No mortality was seen.

Conclusions: Although the mortality of methicillin-resistant staphylococcus aureus surgical site infection is high, we were able to show excellent results due to accurate and aggressive surgical debridement in combination with Daptomycin application.

C14-8

RE-INSERTION PREDICTORS OF INTRAAORTIC BALLOON PUMPS

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Objectives: The reinsertion rate of intraaortic balloon pumps (IABP) has not been clearly reported. We evaluated the use of left-ventricular ejection fraction (LVEF), fractional shortening (FS), and cardiac index (CI) values to assess cardiac performance as weaning criteria for IABP in a prospective study.

Methods: tHS prospective study performed in 100 patients who required IABP. Patients were randomly divided into 2 groups of 50 patients. In group 1, classical hemodynamic criteria were considered as weaning criteria of IABP. In this group, IABPs were removed when measurements of general hemodynamic criteria were established to be in normal ranges. In group 2, LVEF, FS, and CI values reflecting cardiac performance were used to monitor patients under IABP support, and IABPs were removed when LVEF, FS, and CI values reached >30%, >20%, and >2.4 l/min per m², respectively.

Results: Reinsertion of IABP was necessary in 13 patients in group 1 and in 9 patients in group 2 ($P=0.48$). Vascular complications were the main cause of reinsertion of IABP in 7 and 9 patients in group 1 and group 2, respectively ($P=0.59$). Nine patients died in group 1 and 2 in group 2 ($P=0.025$). In group 1, death due to myocardial dysfunction occurred in 8 of 13 patients (62%) who had required reinsertion of IABP; 6 of these patients required reinsertion of IABP because of hemodynamic deterioration, whereas no patients in group 2 required reinsertion of IABP because of hemodynamic deterioration ($P=0.027$). LVEF, FS, and CI values higher than 30% ($P=0.008$), 20% ($P=0.005$), and 2.4 l/min per m² ($P=0.013$), respectively.

Conclusions: LVEF, FS, and CI values higher than 30%, 20%, and 2.4 l/min per m² respectively, showed good outcomes in regard to avoiding reinsertion of IABP, indicating that these measurements were significant predictors for reinsertion of IABP.

C14-9

INHIBITION OF PLATELET GPIIb-IIIa AND P-SELECTIN EXPRESSIONS BY ASPIRIN IS IMPAIRED BY STRESS HYPERGLYCEMIA

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Objectives: Increased aspirin resistance has been described in patients with type two diabetes contributing to an increase in thrombotic events. In this study we examined if acute exposure to increased plasma glucose impaired the inhibitory effects of ASA on platelet activation.

Methods: Eleven healthy volunteers (mean age of 32-years-old) were recruited after informed consent was obtained. No subjects had taken aspirin or any drugs interfering with platelet function within the past 10 days. Whole blood samples were incubated with three different glucose concentrations (200, 300 and 600 mg/dl) followed by incubation with aspirin (325 mg/d or 1000 mg/d). Using flow cytometry, GPIIb-IIIa and P-selectin were analyzed in arachidonic acid (AA)-stimulated platelets.

Results: At physiological glucose concentration, AA-stimulated platelets expression significantly increased GPIIb-IIIa (TFI 319.6±42.7 vs. 59.5±8.2, $P=0.002$) and P-selectin (TFI 179.5±38.5 vs. 4.4±0.7, $P<0.001$) compared to unstimulated cells. Both doses of aspirin caused a significant inhibition of expression of GPIIb-IIIa (36.5%, $P<0.005$) and P-selectin (81%, $P<0.005$), although no significant difference was observed between the two doses. Glucose at 200 mg/dl impaired the inhibitory effect of low dose aspirin (84% for GPIIb-IIIa, $P<0.005$ and 48% for P-selectin, $P=NS$). Glucose at 600 mg/dl completely overwhelmed the inhibitory effect of aspirin. Increasing the dose

of aspirin partially reversed the effect of hyperglycemia on GPIIb-IIIa expression but not on P-selectin expression. A statistically significant interaction between glucose concentrations and aspirin doses was found ($P < 0.001$ for GPIIb-IIIa and $P = 0.004$ for P-selectin).

Conclusions: In conclusion, in vitro concentration-dependent stress hyperglycemia significantly impaired the inhibitory effects of two doses of aspirin on human platelet GPIIb-IIIa and P-selectin expressions. In hyperglycemia, inhibition of the AA-activation pathway with aspirin may not be sufficient to prevent platelet activation.

April 26th, 2008 3rd Congress Day
16:30-18:00
15th Cardiac Scientific Session - Assist
Devices-Heart Failure

C15-1

MECHANICAL CIRCULATORY SUPPORT SYSTEMS AND HEART TRANSPLANT

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Objectives: The number of patients with cardiovascular diseases and end-stage heart failure (HF) is dramatically increasing world wide. Prevention of HF does not give expected results. The World Heart Federation says that cardiac diseases in the 21st century will increase: up to 137% with male patients and 120% with female patients starting from today to 2020 worldwide. Development of pharmacotherapy, mechanical circulatory support systems (MCSS) and heart transplant (HTx) can help HF patients. Unfortunately nor pharmacotherapy neither MCSS today are efficient help to HF patients. Only HTx can be an effective method to patients with end stage heart diseases. However, its application is extremely limited due to the storage of donor hearts. MCSS treatment in our Heart Surgery Center was started in 1999.

Methods: Forty-one patients - 33 males and eight females - were connected to MCSS, 27 of them as a bridge to HTx. The age of patients was from 14 to 63 years. All patients were with low cardio output index. It was < 1.8 l/min./m². Small left ventricle ejection fraction from 10% to 22% and large left ventricle diastolic diameter from 6.3 to 7.9 mm. All patients were on maximal doses of inotropic drugs, diuretics and intraaortic balloon pump support. The diagnoses of patients were: dilatation cardiomyopathy - 17, ischemic cardiomyopathy - 7, toxic cardiomyopathy post antimalignancy treatment - 1, other - 2. Operative technique: extracorporeal blood pump inflow cannula was implanted in the apex of native heart left ventricle, using single Prolene 2/0 sutures with Bard® PTFE felt. The power and controller cable was connected with systems out of the body. Outflow cannula was connected with ascending aorta using continuous Prolene 4/0 suture. Inflow and outflow cannulae were connected with intracorporeal blood pump. The cannulae of paracorporeal heart ventricles were placed out of skin and connected with ventricles. After air embolization prophylaxis pump was turned on.

Results: Duration on MCSS was from 12 to 1097 days. Eighteen recipients were successfully transplanted (67%). Four recipients (14%) died on MCSS because of septicemia - 1, stroke - 2 and 1 patient died because of multi-organic damage. Five patients (19%) are on the waiting list. All of them are at home and have normal social live.

Conclusions: The MCSS is important for patients whom other medical measures cannot help.

C15-2

PERITRANSPLANT ANTICOAGULATION MANAGEMENT IN PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICES

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Objectives: Most left ventricular assist devices (LVADs) need extensive anticoagulation to prevent thromboembolism, which bears an increased risk of bleeding complications during heart transplantation.

Methods: Thirty LVAD patients supported with three different anticoagulation regimes were analyzed for outcome, thromboembolism and bleeding

complications. Ten patients were transplanted under full anticoagulation with phenprocumon (PHN) acetylsalicylic acid (ASS) and clopidogrel (CLO) (group A), in eight patients anticoagulation was switched to a combination of heparin i.v. and ASS (group B), 12 patients received just i.v. heparin (group C).

Results: In group A one patient died from extensive bleeding (mortality rate 10%), in group B all patients survived and in Group C three patients died from perioperative fatal stroke (mortality rate 24.9%). Patients with triple anticoagulation were at highest risk of reoperation for continuous bleeding or implantations of chest drainage for hemorrhagic pleural effusion (group A 80%; group B 37%, group C 25%). Thromboembolic complications increased with the decline of anticoagulation intensity (group A 80%; group B 37%, group C 25%). Patients with non-pulsatile devices seemed to be more susceptible to thromboembolism with platelet inhibition being most important as thromboembolic complications increased up to 160% with the withdrawal of ASS. Within the pulsatile supported patients these rates remained similar (group A 25%; group B 25%, group C 29%).

Conclusions: Limiting anticoagulation to heparin dramatically increases the risk of preoperative thromboembolic complications whereas full anticoagulation bears a significant risk of bleeding. The combination of heparin and ASS prior to heart transplantation seems to be the favorable compromise.

C15-3

ACUTE CARDIAC SUPPORT FOR CARDIOGENIC SHOCK: A SINGLE NON-TRANSPLANT CENTER EXPERIENCE

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Objectives: Acute cardiac failure and/or cardiogenic shock is a mostly lethal condition. The availability of a simple, quick to implant, easy to manage cardiac support device is mandatory to efficacy addressing this problem. In this abstract we report our experience with Levitronix-CentriMag® in a non-transplant center.

Methods: CentriMag® is available at our institution since February 2004. In the 48 months period was used in eight different patients. In six cases were young patients (<65-year-old) postcardiotomy failure (1 bivalve replacement, 2 CABG and 1 MV Replacement+CABG, 1 congenital Recidivate Surgery) and two cases a young ladies (28 and 37-year-old) with acute cardiorespiratory failure due to in one case to LES pneumonia and another to severe obesity with Myocardial Infarction. In five cases the first stage of assistance was an ECMO (MEDOS-LT-oxygenator applied), two of which were subsequently converted to RVAD assistance that allowed transfer to a transplant center. In two cases Levitronix® was primary implanted as LVAD, and one case as RVAD (congenital RVOT atrophy). The cannulation-sites were both central (RA/LA to Ascending-aorta) or peripheral (Femor-femoral). In one patient the assistance was initiated during CPR in the cath-lab and survived uninjured.

Results: Four patients were successfully weaned from support, one died immediately after. In one case acute RV failure developed soon after weaning from the ECMO, thus CentriMag® RVAD support was promptly initiated. The support-devices constantly allowed flows above the 4 l/min. Heparin infusion was used only when no bleeding was present from the drainages (<20 cc/h), and ACT was kept between 180-200 s. for ECMO, and around 150 s. in VAD support. In one ECMO patient we used Lepirudine at a PTT_r 2-2.5 range due to previous history of Heparine-Induced Thrombocytopenia. Standard ICU bed and protocols were applied. Weaning from the devices were initiated when cardiac function was estimated acceptable by TEE-monitoring, usually 24h before assistance removal.

Conclusions: in our experience the Levitronix CentriMag® was an easy and prompt, off the-shelf, cardiac-support-device. In our center with no transplant and very limited cardiac support experience the device allowed cardiovascular resuscitation in extremely diseased patients. Its implant and ICU management was extreme.

C15-4

CENTRIFUGAL PUMP AS MECHANICAL CIRCULATORY SUPPORT IN ADULTS

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Objectives: A mix of cardiac assist options is necessary to meet the diverse indications for cardiac support in a comprehensive heart failure program. At our institution a centrifugal pump (Rota Flow Jostra or Levitronix Centrimag) associated with an hollow-fiber 68 membrane, polymethyl-pentene oxy-

generator (Quadrox), in a paracorporeal fashion, is used for short-term and temporary adult cardiac assist.

Methods: Between January 2001 and November 2007, 46 adult cardiac patients were supported on centrifugal pump. Thirty-two were male. Mean age was 47.5 ± 17.4 years (range 18-78 years). Indications for primary support at implantation were: postcardiotomy cardiogenic shock ($n=31$) and bridge to decision regarding transplantation or long-term ventricular support ($n=15$) (10 dilated cardiomyopathy, four acute myocardial infarction, one fulminant myocarditis).

Results: Mean support time was 10.8 ± 8.4 days for all patients (range 1-30 days). Central cannulation was performed using both atria for venous drainage and the ascending aorta for arterial return (Group A=18 patients, Group B=14 patients), according to a numerical computer model with mathematical processing for the different physio-pathological conditions. The peripheral femoro-femoral implantations were performed using the Seldinger technique. Operative (30-day) mortality was 28.2% (13 patients). Eight patients were in Group A and 5 patients were in Group B. Overall, 20 patients (43.4%) were weaned from support (Group A=19 patients, Group B=1 patients), 13 patients (28.2%) were transplanted (Group A=4 patients, Group B=9 patients) and 22 patients (47.8%) were successfully discharged home (Group A=15 patients, Group B=7 patients). Bleeding requiring re-operation occurred in 17 (36.9%) cases and cerebral thromboembolism in 5 (10.8%). There were no device failures.

Conclusions: Centrifugal pump associated with an oxygenator proves to be useful in patients with extremely poor prognosis previously considered non-suitable for a long-term assist device or transplantation. The system, easy to manage on the basis of computer mathematical models analysis, provides correctly full cardio-pulmonary and end-organ support thus remaining our first choice of treatment.

C15-5

SIROLIMUS PROLONGS SURVIVAL IN HEART TRANSPLANT RECIPIENTS

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Objectives: Aim of the study was to assess an impact of sirolimus used as a part of immunosuppressive therapy on survival of orthotopic heart transplantation (OHT) recipients.

Methods: We performed a retrospective case-control study involving all 60 OHT recipients receiving sirolimus (study group), and 60 matched individuals treated without sirolimus (control group). In almost a half of patients, sirolimus was used for a short period of time early after transplant, or introduced late after procedure. However, we identify 31 patients in whom sirolimus was introduced before the 3rd year post-transplant, and continued for at least three years, or till the end of observation (28M/3F, 45±11-years-old, ischemic c-pathy in 15 patients). Majority of them received a combination of sirolimus and low-dose cyclosporine-A, which was replaced with mycophenolate mofetil three years post transplant (at the end of the observation 21 patients were without calcineurin inhibitor). They were confronted with their matches from control group (28M/3F, 44±11-year-old, ischemic c-pathy in 17 patients). We compared survival time and time free from death from particular causes. Significance was assessed using log-rank test and χ^2 -test, when applicable.

Results: Average follow-up was 2138 ± 1192 days in study group and 1949 ± 1221 days in control group (2169 ± 650 vs. 1872 ± 987 days, respectively, in substudy). Fourteen (33%) deaths occurred in study group and 25 (42%) in control group ($P=0.032$) 5 (16%) deaths in study subgroup vs. 14 (45%) deaths in control subgroup ($P=0.028$). Survival time was significantly longer both in the whole study group and subgroup when compared with matched controls ($P=0.044$ and $P=0.019$, respectively). The same trend was observed when a time free from non-cardiac death was compared ($P=0.036$ and $P=0.022$, respectively).

Conclusions: Long-term therapy with sirolimus prolongs survival in heart transplant recipients. This effect is related to the decreased probability of non-cardiac death in this group of patients.

C15-6

NEGATIVE IMPACT OF GENDER MISMATCH IN ORTHOTOPIC HEART TRANSPLANTATIONS ON LONG-TERM SURVIVAL IS CONCOMITANT WITH INCREASED NUMBER AND SEVERITY OF REJECTIONS

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Objectives: Heart transplantation has remained the gold standard in the treatment of end stage heart failure since the first heart transplantation procedure in 1967. Regarding survival, an advantage of male sex, both of the donor organ and of the transplant recipient, is well known, which may be due to hemodynamic as well as immunological reasons. However, the impact of gender mismatch in the long-term survival in male Htx recipients is much less known.

Methods: In the present retrospective single center study, we reviewed and compared the follow-up data of 57 gender mismatched with 179 gender matched male patients who underwent orthotopic heart transplantation between 1990 and 2002.

Results: Median survival was significantly shorter in the gender mismatched group compared to the gender matched equivalents (8.1 vs. 12.9 years, $P<0.04$). Subgroup analyses revealed that this is even more pronounced for male heart recipients with coronary artery disease (2.4 vs. 12.9 years, $P<0.001$) compared to those with dilative cardiomyopathy receiving a female heart (n.s). The female donor organs were significantly smaller (LVEDD 49 vs. 51 mm, $P<0.05$) and suffered more often from clinically relevant episodes of cellular rejections during the first three months (ISHLT Grade III 3.1 vs. 5.6%, $P<0.001$). No significant functional differences between female and male donor organs were observed with regard with respect to left ventricular systolic and diastolic function. Immunosuppressive regimes did not differ significantly. Analyses of inflammatory parameters including leukocyte count and CRP revealed no significant differences between both groups.

Conclusions: In male orthotopic heart transplant recipients our results give emphasis to the hypothesis that gender mismatch is associated with an adverse outcome caused by increased number and severity of rejections by underlying immunological factors.

C15-7

PARTIAL LOADING OF THE LEFT VENTRICLE DURING MECHANICAL ASSIST DEVICE SUPPORT IS ASSOCIATED WITH IMPROVED METABOLISM OF NEUROENDOCRINE HORMONES AND INCREASED EXERCISE CAPACITY

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Objectives: Myocardial recovery has been observed after placement of left ventricular assist devices (LVAD) in some patients awaiting cardiac transplantation. LVADs provide profound volume and pressure unloading while restoring systemic blood flow. However, the optimal degree of left ventricular unloading during LVAD support is unknown.

Methods: Sixteen patients with an LVAD underwent cardiopulmonary exercise testing employing spirometry. Every week, the level of support (measured as LVAD output) was reduced by 25% and exercise testing repeated the day afterwards. Left ventricular unloading was assessed by echocardiographic measurement of LVEDD. Blood samples for plasma epinephrine, plasma norepinephrine, plasma renin and vasopressin were taken before and immediately after the exercise test. Plasma lactate was assessed every two minutes during the test.

Results: Reduction of ventricular support to 75%, 50% and 25% lead to a significant increase in LVEDD compared to baseline. The increment of support from 50% to 75% lead to an increase in peak oxygen consumption and maximum exercise capacity. Exercise lead to a significant increase of norepinephrine and epinephrine levels at each level of support. Plasma norepinephrine and epinephrine levels were not significantly different at the four levels of support before and after exercise testing. Plasma renin activity at rest was significantly higher at 25%, 50% and 100% of support than it was at 75%. After exercise testing, plasma renin activity was significantly higher as being at rest in all groups. However, the difference was significantly lower when support was at 75% as compared to 25%, 50% and 100%. The time interval for lactate to reach normal levels was significantly shorter at 75% of support compared to 25%, 50% and 100%.

Conclusions: These results suggest that partial loading of the left ventricle does not result in a linear neuroendocrine response and exercise capacity. There is a physiologic optimum during which the left ventricular assist device support is most beneficial, also indicating that partial unloading is superior to complete unloading.

C15-8

LEFT VENTRICULAR RESTORATION - IMPORTANCE OF THE SURGICAL DETAILS

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Objectives: In patients with coronary disease and poor LV function, ventricular reconstruction (SVR) is viable surgical option. Criteria for optimal surgical technique are still debated.

Methods: Data were analyzed for 115 consecutive SVR patients from March 2003 to July 2007. Reconstruction was accomplished using a template for creating an elliptical ventricle with a precalculated volume (mannequin, CHASE Med. USA) according to Menicanti Maximum oxygen consumption and 6 min walk test identified patients functional status. Cox regression analysis was performed to determine predictors of functional status.

Results: Mean age was 57±9 years with a male: female ratio of 92: 23. Operative mortality was 4.3% (5 of 115). Forty three percent (50 of 115) had concomitant mitral valve procedures. Cox regression analysis identified the following to be significant predictors of worse postoperative functional status: pre-operative presence of mitral regurgitation, pre-operative restrictive type of LV filling, intra-operative usage of rigid (no pericardial) patches.

Conclusions: LV reconstruction according to Menicanti proves to be safe method. It provides good control of symptoms and improves functional status more in patients who had soft pericardial patch implanted.

C15-9

EARLY EXPERIENCE WITH SURGICAL VENTRICULAR RESTORATION AS ADJUNCT THERAPY FOR DILATED ISCHEMIC CARDIOMYOPATHY

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Objectives: To report on the early experience with surgical ventricular repair (SVR) of dilated ischemic cardiomyopathy as adjunct heart failure treatment.

Methods: Since April 2005, 19 patients underwent SVR with concomitant CABG and mitral valve repair or replacement. The indication for SVR was primarily based on LV volume determination. Retrospective analysis was focused on clinical outcome and short-term echocardiographic assessment of systolic and diastolic left ventricular (LV) performance.

Results: All patients (mean age 68.5 years) were preoperatively in NYHA class III-IV (mean 3.4), presenting an absolute EuroSCORE of 11.2, which corresponded to a predicted operative mortality of 25.8%. In-hospital mortality was 17%. Within a mean follow-up of 16±7 months, all survivors improved to NYHA class I-II (mean 1.8), including 3 re-hospitalizations and 1 late death. Echocardiographic evaluation revealed a significant increase of LVEF (27%→33%; $P<0.001$), and fractional shortening (16%→22%; $P<0.001$) and lower wall motion score index ($2.26>1.92$; $P<0.001$) within one month, correlating with the significant reduction of LV volumes. Diastolic LV dysfunction worsened progressively during the first year as indicated by increased E/A ratio ($1.31>1.97$; $P=0.03$) and shortened deceleration time ($169>149$ m/s). Deterioration of diastolic function correlated with secondary increase of LV volumes, recurrent mitral regurgitation and withdrawal of diuretic therapy.

Conclusions: Surgical ventricular restoration results in a significant improvement of the systolic LV function, and subsequently to an improved clinical status. However, it entails a time-dependent impairment of the diastolic LV function related to secondary remodeling within the first year. Further study is required to define whether the gradual diastolic dysfunction is reversible or is a subtle precursor of subsequent systolic dysfunction.

C15-10

HEALING HEART FAILURE BY ELECTRICAL MICROCURRENT APPLICATION. SCIENCE OR FICTION?

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Objectives: It has been shown that unloading of hearts by cardiac assist devices leads to improvement of the hearts function to variable extent. Improvement fails if the extracellular matrix (ECM) shows pronounced remodelling. Electrical microcurrent (MC) modifies and reverses the remodelled myocardium (collagen I and III, MMPs, TIMPs, cytokines) of spontaneously hypertensive rats (SHR) under in-vitro conditions. The goal of these experiments is to investigate the effect of MC on the myocardium with particular focus on the ECM and healing of heart failure in-vivo.

Methods: Two patch electrodes were surgically placed around the hearts of five spontaneously hypertensive rats (SHR). MC was applied over a period of

up to 31 days. Thereafter, parameters of the ECM of the myocardium were analysed and compared to the myocardium from wild type rats (WKY) and SHR without previous MC application. Gene expression (quantitative PCR) was measured for MMP 2, 3, 8, 9, 13, 14, 16; TIMP 1, 2, 3, 4; connexin 40, 43, 45 and collagen I and III and eventually the level of IL-6.

Results: 1: Compared to the myocardium of WKY, the myocardium of SHR without MC application showed a significantly higher level of MMP 3, significant lower level of MMP 8, 14, 16 and an unchanged level of MMP 2 and 13. The TIMPs and connexins were only marginally altered. Collagen I showed an upregulation of 40%. 2: A comparison of the myocardium of the SHR with and without MC application showed significant changes of MMP 2, 3, 9, 13, 14 and 16 which were significantly up-regulated. MMP eight remained unchanged, and most importantly, collagen I was up-regulated by a factor of 2.5. All other analysed parameters were not altered by MC application except the gene expression level of IL-6 which was significantly down regulated.

Conclusions: MC application regulates MMPs and collagen I on the gene level and normalizes the ECM of hearts in failure. IL-6 was significantly down regulated. MC application initializes a process towards healing of the diseased myocardium.

April 26th, 2008 3rd Congress Day

16:30-18:00

16th Cardiac Scientific Session - Cardiac
Minipresentation I

C16-1

CARDIAC RESYNCHRONIZATION THERAPY IMPROVES RESULTS OF SURGICAL TREATMENT FOR HEART FAILURE

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Objectives: The aim of this study was the evaluation of the benefits of cardiac resynchronization therapy (CRT) as an adjunct to conventional surgical procedures for heart failure.

Methods: Twenty-five patients (14 men and 6 women, with a mean age of 71±8 years) in NYHA FC III-IV, Left ventricular ejection fraction (EF) 30%, left ventricular end diastolic diameter (LVEDD) 55 mm, QRS duration 130 ms and/or mechanical dyssynchrony demonstrated at Tissue Doppler Imaging, were enrolled in the study. In ten patients the etiology was ischemic and fifteen had idiopathic cardiomyopathy. Three patients underwent isolated CABG, fifteen had mitral valve overreduction with an annuloplasty ring. In seven patients both procedures were performed. In all patients a single bipolar epicardial lead was secured to the left ventricular wall and its extremity brought into a subclavian pocket. Right atrial and ventricular endocardial leads were implanted in a standard fashion. In five patients the resynchronization device was implanted at the time of surgery; in nine 3 months, in two six months and in, another two, one year after surgery. In three patients a defibrillator-resynchronization device was utilized. Six patients have are still awaiting implantation.

Results: One patient died post-operatively of low output syndrome. Twenty-four patients were discharged from the hospital and were alive at a mean follow-up of 12.8 months (3-40 months). All presented a significant improvement of NYHA FC (average 1.7). Mean EF increased from 24.4% to 34.3% at three months in patients who underwent surgery alone and from 25.7% to 44.6% in patients who underwent both surgery and CRT ($P<0.01$). The electrical performances of the epicardial leads were satisfactory at the time of implant as well as at follow-up.

Conclusions: With the limitations inherent to the small number of patients and the relative short duration of the follow-up, this study shows that patients with dilated cardiomyopathy and left ventricular dyssynchrony in whom surgical correction is indicated, may benefit from CRT using a resynchronization device connected to an epicardial lead secured to the left ventricle at the time of surgery. Implantation of left ventricular epicardial leads during surgery is an easy, fast and safe procedure. Electrical parameters of the implanted leads are stable over time, allowing for easy subsequent implantation of a CRT should the need arise. Further experience in a larger number of patients and extended follow-up is warranted in order to validate the results of this limited but encouraging experience.

C16-2**THE EFFECTIVENESS OF STATINS IN DECREASING THE INCIDENCE OF SYSTEMIC INFLAMMATORY RESPONSE SYNDROME AFTER CORONARY ARTERY BYPASS SURGERY**Y. Dereli¹, E. Ege¹, S. Kurban², C. Narin¹, A. Sarigul¹, M. Yeniterzi¹¹Department of Cardiovascular Surgery, Selcuk University Meram Medical School, Konya, Turkey; ²Department of Biochemistry, Selcuk University Meram Medical School, Konya, Turkey

Objectives: Systemic inflammatory response syndrome is frequently seen after coronary artery bypass graft surgery. Recent studies show that, preoperative use of statin treatment is associated with a decrease in inflammatory mediators such as C-reactive protein, cytokines and adhesion molecules. We have evaluated the effect of preoperative atorvastatin treatment on systemic inflammatory response after coronary artery bypass surgery.

Methods: Forty patients, who had elective coronary artery bypass surgery operation, were divided into two groups. Patients were randomized preoperatively as atorvastatin (20 mg/day, group I, n=20) and placebo (group II, n=20) groups. All of the patients were operated via cardiopulmonary bypass technique and blood samples were taken at preoperatively and postoperative 24th h.

Results: No significant changes were detected in case of preoperative demographic data. Post-operative 24th h median (interquartile range) hsCRP was 88.0 (18) in study group and 113 (22) in the control group, whereas mean interleukin-6 was 43.4±18.5 in study group and 69.6±19.2 in the control group and both of the parameters were significantly lower in the study group (P<0.05).

Conclusions: Preoperative atorvastatin treatment in patients who had elective coronary artery bypass surgery decreases inflammation parameters and may be effective in preventing systemic inflammatory response syndrome.

C16-3**POSTOPERATIVE ATRIAL FIBRILLATION AND HELICOBACTER PYLORI: IS A POSSIBLE PATHOGENIC LINK?**

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Objectives: New scientific studies have demonstrated the possible correlation between Helicobacter Pylori (HP), responsible of chronic gastric diseases, and atrial fibrillation. The goal of our study is of relieving the presence of HP in stools of patients who have to undergo to cardiac revascularization, and of evaluating the developing of atrial fibrillation in the early postoperative time.

Methods: From April to December 2007, seventy consecutive patients undergoing cardiac revascularization were included in this study. Before surgery, they have been studied with physical examination, ECG, echocardiography and coronary angiography: structural cardiac defects, as valvular diseases and atriomegaly were exclusion criteria. The cardiac predictor risk factors as diabetes, arterial hypertension and routine laboratory tests, in particular potassium and inflammatory index as CPR and leukocytosis, were evaluated. We have used a specific rapid test for researching of HP antigens in a little pattern of stool, supply from patient before surgery. In the postoperative time, all patients underwent daily routine laboratory tests and they were monitored for AF.

Results: There were no significant differences between the groups regarding the presence of traditional risk factors, cholesterol, low density lipoprotein cholesterol and triglycerides. There were no significant difference in the mean ages of the two groups. Atrial fibrillation developed in 21 patients, 28% of them had a positive HP test. At univariate analyses, factors associated with postoperative onset of atrial fibrillation were high inflammatory index and atrial dimension. At multivariate analyses, factors associated with postoperative onset of atrial fibrillation were high inflammatory index and positive HP test.

Conclusions: We report high concentrations of CRP, which confirm the presence of systemic inflammation in patients with AF, which leads us to hypothesize that HP infection may be substrate of this systemic inflammation manifesting in AF. We have shown the significant link between AF and HP in our relatively small sample and confirm that CRP is a good marker for the inflammatory process. More data will be necessary from controlled studies to further identify how HP can influence the pathogenesis of AF.

C16-4**THE RELATION BETWEEN LEFT VENTRICULAR FUNCTIONS, PROINFLAMMATORY CYTOKINES AND LOCALIZATION OF MYOCARDIAL INFARCTION IN PATIENTS UNDERGOING CORONARY ARTERY SURGERY**I. Kiris¹, S. Kapan¹, C. Narin², M. Ozaydin³, M.C. Cure⁴, R. Sutcu⁴, H. Okutan¹¹Department of Cardiovascular Surgery, Suleyman Demirel University Medical School, Isparta, Turkey; ²Department of Cardiovascular Surgery, Selcuk University Medical School, Konya, Turkey; ³Department of Cardiology, Suleyman Demirel University Medical School, Isparta, Turkey; ⁴Department of Biochemistry, Suleyman Demirel University Medical School, Isparta, Turkey

Objectives: The purpose of this study was to examine the relation between left ventricular (LV) functions, the levels of proinflammatory cytokines and the localization of myocardial infarction (MI) in patients undergoing coronary artery bypass grafting (CABG).

Methods: Sixty patients undergoing CABG were included into the study. The patients were divided into three groups according to their history of myocardial infarction (MI) localization as follows; no MI history (n=20), anterior MI (n=20) and posterior/inferior MI (n=20). In the preoperative period, the parameters of a detailed analysis of LV functions with transthoracic echocardiography included left ventricular enddiastolic volume (LVEDV), left ventricular enddiastolic diameter (LVEDD), left ventricular enddiastolic volume index (LVEDVI), left ventricular endsystolic volume (LVESV), left ventricular endsystolic diameter (LVESD), left ventricular endsystolic volume index (LVESVI), fractional shortening (FS), left ventricular ejection fraction (LVEF), basal lateral systolic flow and septal systolic flow. The levels of adrenomedullin, interleukin-1-beta, interleukin-6, tumor necrosis factor-alpha (TNF-alpha) and angiotensin-2 both in peripheral blood samples and pericardial fluid were also measured.

Results: Patients with anterior MI had significantly worse LV functions than patients with no MI history had as shown by LVESD, FS, LVEDD, LVESV, LVESVI, LVEF, basal lateral systolic flow and septal systolic flow (P<0.05). Patients with anterior MI also had significantly worse LV functions than patients with posterior/inferior MI had as shown by LVESD, FS, LVESV, LVESVI and LVEF (P<0.05). Patients with posterior/inferior MI had worse LV functions than patients with no MI history had as shown by LVEF (P<0.05). In plasma samples, the levels of adrenomedullin and angiotensin-2 in anterior MI group were significantly higher than that in no MI history group (P<0.05). In pericardial samples, the levels of adrenomedullin, angiotensin-2, interleukin-6 and interleukin-1-beta in anterior MI group were significantly higher than that in no MI history group (P<0.05) and the levels of adrenomedullin, interleukin-6 and interleukin-1-beta in anterior MI group were significantly higher than that in posterior/inferior MI group (P<0.05).

Conclusions: The results of this study indicate that (i) patients with anterior MI have worse LV functions than both patients with no MI history and patients with posterior/inferior MI have and (ii) the levels of proinflammatory cytokines in plasma and pericardial fluid in patients with MI are increased compared to patients with no MI.

C16-5**LONG-TERM RESULTS OF VENTRICULAR RESTORATION SURGERY: IMPACT OF TRICUSPIDAL REGURGITATION**

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Objectives: The presence of pulmonary hypertension among patients with systolic heart failure identifies a distinctly higher risk population. The Doppler evaluation of pulmonary hypertension has been validated by some investigations, but there are very little data about prognostic value of tricuspidal regurgitation (TR) in patients with ischemic LV dysfunction. The goal of present study was to identify impact of TR on late functional results and survival after surgical ventricular restoration in patients with severe LV dysfunction.

Methods: We retrospectively analyzed the data of 139 consecutive patients with LV aneurysm and/or ischemic cardiomyopathy with mean LVEF 32.8±7.2%, who underwent surgical ventricular restoration plus CABG. MV surgery was performed in 20 (14.4%) and tricuspid valve annuloplasty in 6 (4.4%). Mean NYHA class was 3.5±0.6. Preoperatively mild TR was presented in 53 (38.1%) of patients, moderate in 17 (12.2%) and severe - in 4 (2.9%) of patients. Statistical analysis was performed with SPSS 15.0 for Windows.

Results: Mean NYHA class improved to 2.3±0.4 at 1 year and 2.4±0.5 at 5 years postoperatively (P<0.001). Mean LVEF improved to 37.5±7.9% at 1 year and 36.2±6.9% at 5 years postoperatively (P<0.001). Perioperative mortality

was 7.2%. Actuarial survival rates at 1, 3, 5 and 6 years were 91.6±2.5, 86.8±2.9, 81.4±3.5, 69.8±4.5 and 62.6±5%, respectively. Degree of TR had no correlation with NYHA class 1 year after surgery (χ^2 1.99, $P=0.16$). Logistic regression model demonstrated that TR had impact on late survival (0.83 (0.32), $P=0.008$), but not on 30 days postoperative mortality (N.S.) χ^2 and Fisher exact test also demonstrated, that TR had impact on late survival ($P=0.015$), but not on early survival ($P=0.58$).

Conclusions: Degree of TR had no correlation with 30 days mortality and NYHA class 1 year after CABG plus LV reconstruction surgery in patients with severe LV dysfunction, but had negative impact on late survival.

C16-6

MULTIVALVULAR SURGERY FOR CARCINOID HEART DISEASE

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Objectives: Carcinoid tumors with hepatic metastases may cause CHD by releasing biogenic amines. Valvular lesions involve predominantly right-sided valves and are a main cause of morbidity and mortality. Scarce data are available with respect to the outcome of cardiac surgery in these patients. We sought to study the clinical impact of carcinoid heart disease (CHD) and to analyze the outcome of valvular surgery in this particular setting.

Methods: From January 2001 through December 2007, 11 patients (5 females, age 59±9 years) with CHD underwent multivalvular surgery (right-sided valves, $n=8$; right and left-sided valves, $n=3$).

Results: All valvular lesions consisted of leaflet thickening and retraction. Valvular dysfunctions involved tricuspid regurgitation ($n=11$), pulmonic regurgitation/stenosis ($n=10$), mitral regurgitation ($n=3$), and aortic regurgitation ($n=1$). Severe right ventricular dysfunction was present in six patients. Surgical procedures included tricuspid replacement in 1 patient, tricuspid and pulmonic replacement in 7, triple valve surgery in 2 and quadruple valve surgery in 1 patient. There were 2 operative deaths secondary to right ventricular dysfunction. No major morbidities occurred in the remaining 7 patients. After a mean follow-up of 37 months (range 2-75), all patients are alive. One patient presented with early bioprosthetic structural valve deterioration secondary to carcinoid plaque deposition.

Conclusions: Carcinoid Heart Disease is rare and may affect both right and left-sided valves. Cardiac surgery should be strongly considered in patients with severe valvular dysfunction. Right ventricular dysfunction is the main factor impacting negatively the outcome of surgery in these patients. In patients with left-sided valvular disease, reconstructive surgery can be performed safely in selected patients.

C16-7

DOES THE ROUTINE USE OF TRANEXAMIC ACID IN ADDITION TO PROTAMINE REDUCE POST OPERATIVE BLOOD LOSS, RESTERNOTOMY RATE AND BLOOD TRANSFUSION IN CABG PATIENTS?

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Objectives: To audit the success of new blood saving protocols at the Cardiothoracic Centre, Liverpool in reducing postoperative blood loss, re-sternotomy rate and rate of blood transfusion in patients undergoing coronary artery bypass surgery. The main variable to be evaluated was the routine administration of tranexamic acid in addition to protamine at the time of surgery.

Methods: A retrospective audit of data on the cardiac database based on patients undergoing elective coronary artery bypass grafting. The data of 128 patients undergoing surgery prior to the introduction of tranexamic acid and 100 patients after the introduction of the new protocol was reviewed. All records were verified by the audit department. Consultants were anonymised and no consultants were excluded from the study. All members of each group were given a EuroSCORE to prove that there was no significant difference in the pre-morbid condition of each group. The total blood loss, number of units of blood transfused and need for re-sternotomy was recorded for each patient. Note was also made regarding the use of cell-savers.

Results: Results showed that there was significantly less blood loss in the tranexamic acid group when compared to the group of patients who did not receive tranexamic acid ($P<0.01$). Results were also favourable in this group for the rate of re-sternotomy with less patients in the tranexamic acid group requiring reoperation (P -value 0.04). Patients who received

tranexamic acid also required less blood transfusion than those not receiving tranexamic acid (0.37 units per patient compared with 0.679 units per patient, respectively).

Conclusions: This audit proved that the introduction of blood saving protocols at this centre has significantly reduced the total postoperative blood loss, re-sternotomy rate and blood transfusion requirement in patients undergoing elective coronary artery bypass surgery. Further evaluation with larger numbers of patients ought to be carried out in order to support this audit data. This work also highlights that there ought to be a review of the current crossmatching protocol at this centre in order to reduce waste and the costs involved with the crossmatching process as only 124 of the 598 units of blood crossmatched were required.

C16-8

EVALUATION OF HEMODYNAMIC FLUCTUATIONS BY INVASIVE AND SEMI-INVASIVE MONITORING DURING OFF-PUMP MYOCARDIAL REVASCULARIZATION SURGERY

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Objectives: The off-pump myocardial revascularization surgery still requests for thorough monitoring of a range of cardiac function and circulation parameters. We evaluated and compared continuous cardiac output alterations during revascularization of different myocardial zones by both invasive and semi-invasive monitoring of cardiac function and studied fluctuations of specific pressures, myocardial circulation and cardiac output.

Methods: The study was being performed from year 2003 till 2006. One hundred and fifty-eight patients undergoing OPCAB were monitored for cardiac function and circulation alterations. Measurements of relevant values by both TD and ED were taken at the following timepoints: t1 - after pericardiotomy; t2 (LAD) - during LV anterior wall revascularization; t3 (Cx) - during LV lateral and inferior wall revascularization; t4 (RCA) - during LV posterior wall revascularization; t5 - after grafting, before the chest is closed

Results: The most distinct changes were found during LV posterior/inferior wall revascularization (t3), with such most variable parameters as systemic pressure (SAP=87.2±12.0 mmHg; DAP=52.9±14.0 mmHg), myocardial circulation alterations (ST1=-0.09; ST2=-0.05) and mild mean HR increase (HR t3=71.9±14.7 and HR t4=73.6±11). Alterations of pulmonary artery mean and diastolic pressures were observed during the whole surgery, especially during revascularization of LV inferior (t3) and posterior walls (t4). Statistically reliable difference in mean CI values, measured by two different methods, was seen only during LV lateral/inferior wall revascularization: t3 $r=0.34$; $P=0.032$ and t4 $r=0.185$; $P=0.477$. Lowest CI values were shown by ED method, demonstrating even dangerously low values - ED CI=1.73 l/min/m². At the beginning and at the end of surgery for other LV walls revascularization both methods demonstrated close correlation between CI mean values with high reliability.

Conclusions: Cardiac output values, monitored by invasive and semi-invasive methods, do not considerably differ in stable hemodynamic status, but are reliably different in altered hemodynamic (LV posterior and lateral wall revascularization). Esophageal echo-Doppler ultrasonography is a satisfactory, but not the best alternative for cardiac output measurement, as it correlates well with CCO measurement, but it does not provide information about oxygen availability. However, it is a useful tool to screen patients for identifying those who may benefit from invasive monitoring.

C16-9

IS VARIABLE FLOW OF SUCCESSFUL LITA GRAFT FOR LAD LESION CORRELATED WITH MYOCARDIAL OXYGEN CONSUMPTION OR NOT?

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Objectives: Intraoperative graft flow measurement during coronary artery bypass grafting (CABG) is useful for the verification of anastomosis patency. Limited to the successful grafting cases with anastomosis of good quality, however, graft flow may be quite variable indicating other determinants of flow. Knowing flow determinants would enhance the evaluation of patency. To extend our report showing increase in graft flow of left internal thoracic artery (LITA) with extrinsic sympathetic stimulation to match the increased

metabolic demand in dogs, we investigated in CABG patients the major determinant(s) of LITA graft flow.

Methods: We have selected 39 patients who had received CABG with LITA to left anterior descending artery (LAD) anastomosis between December 2006 and November 2007. Patients with multiple LAD lesions, left main trunk lesion, and acute myocardial infarction were excluded. These 39 patients were divided into two groups. Group A consisted of 19 patients performing LITA grafting for proximal LAD lesions (#6). Group B consisted of 20 patients performing LITA grafting for distal LAD lesions (#7). All LITA was harvested by skeletonized technique using ultrasonic scalpel. Intraoperative LITA graft flow (Q) was measured by ultrasound transit time method. We selected double product (DP=heart rate X systolic blood pressure, an index of myocardial oxygen consumption), hemoglobin (Hb, an index of hemodilution) and preoperative interventricular septal thickness (IVST, an index of ventricular mass) for potential determinants of Q (independent variables).

Results: In group A, Q varied from 11 to 97 ml/min. By stepwise multiple regression analysis after logarithmic transformation, only DP [$Q=4.9 \cdot 10^{(-7)} \cdot (DP)^{1.98}$, $R^2=0.353$, $P<0.01$] was selected as determinants of Q. Hb and IVST did not correlate with Q. In group B, Q varied from 7.8 to 70 ml/min. Only Hb [$Q=6.53 \cdot 10^{(-4)} \cdot (Hb)^{(-3.53)}$, $R^2=0.290$, $P<0.05$] was selected as determinants of Q. DP and IVST did not correlate with Q.

Conclusions: Double product affected LITA graft flow for proximal LAD lesions. This indicates that graft flow is correlated with myocardial oxygen consumption predicted by double product. Graft flow for distal LAD lesions was, however, chiefly influenced by hemoglobin and was not correlated with double product. When perfusion area becomes smaller, oxygen transfer capability or viscosity rather than myocardial oxygen consumption of the whole heart is crucial in flow change.

C16-10 ANEMIA AND NEEDS OF POSTOPERATIVE BLOOD TRANSFUSION DEPENDING ON RENAL FUNCTION IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Objectives: Chronic kidney disease is a risk factor for anemia, which consequently may result in increased needs of blood transfusion after cardiac surgery. The study aimed to evaluate whether the impaired renal function correlates with higher postoperative transfusion rate.

Methods: We examined 441 consecutive patients undergoing isolated coronary artery surgery. Dialysis-dependent patients and patients undergoing emergency operation were excluded from the study. Renal function was expressed as estimated glomerular filtration rate (GFR) using Cockcroft-Gault formula. Twenty clinical and demographic variables were taken into consideration in the course of the study.

Results: At least moderately decreased preoperative GFR (lower than 60 ml/min) was detected in 102 patients (23%) out of them 18 were anemic (17.5% compared to 11.5% anemic patients in the group with GFR \geq 60 ml/min, $P=0.1$; anemia was defined as Hb<13g/dl in men and Hb<12 g/dl in women). Preoperative hemoglobin level was positively correlated with GRF value ($R=0.21$, $P<0.001$) and significantly lower in patients with GFR<60 ml/min ($P<0.01$). After operation 182 patients needed any blood transfusions. One hundred and forty-eight patients got red cell transfusion (274 red blood cell unit). Patients with GRF<60 ml/min needed blood transfusions (56% vs. 37%. $P=0.003$) and red cell transfusions (45% vs. 30%, $P=0.031$) more often than patients with normal or mild decreased GFR (60 ml/min). Preoperative higher GFR reduced the risk of any blood transfusion after operation (odds ratio 0.87 for every 10 ml/min, $P=0.004$). The other independent risk factors for any blood transfusion were: lower preoperative hemoglobin (OR: 0.82 for every g/dl), postoperative chest tube drainage volume (OR: 1.4/100 ml) and duration of extracorporeal circulation (OR: 1.1/10 min). The logistic regression analysis did not show that lower GFR is an independent risk factor for red blood cell transfusion. However, the number of transfused red blood cell units was inversely correlated with preoperative GFR (R Spearman=-0.18, $P<0.01$). Hemoglobin level at patients' discharge was comparable in patients with GFR <60/ml/min and in patients with GFR \geq 60/ml/min ($P=0.38$).

Conclusions: Patients with impaired renal function are the group at higher risk for blood transfusion after cardiac surgery and possibly they could benefit from the therapy which helps to reduce the rate of allogenic transfusion (for example autotransfusion).

C16-11 OUTCOME AFTER REDO CORONARY ARTERY BYPASS GRAFTING WITH AND WITHOUT CARDIOPULMONARY BYPASS

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Objectives: Redo coronary artery bypass grafting (CABG) is still associated with increased morbidity and mortality compared to primary operation off pump redo CABG seems to be an attractive alternative as native coronary blood flow remains and cross clamping of the aorta is avoided. The aims of this retrospective study were to compare the outcome of redo CABG with and without CPB.

Methods: Data was collected from 174 patients who underwent redo CABG between January 1, 2000 to November 30, 2007. All patients included in the study have direct coronary artery bypass grafting at their first cardiac operation and also have repeated coronary grafting on cardiopulmonary bypass or without it at their second duration. Patients with other combined cardiac procedures were excluded.

Results: During the study period 26 patients (3 females, 23 males) underwent CABG without CPB and 148 with (21 females, 127 males). The mean EuroSCORE in off-pump group was 5.1 \pm 2.0 and in on-pump group 5.7 \pm 2.1. Mean graft per patient in off-pump group 1.7 \pm 0.8 in on-pump 2.8 \pm 1.0. Hospital mortality in off-pump group 4.7% in on-pump group 7.5% and late outcomes were comparable between groups.

Conclusions: In our limited experience, redo CABG was performed with acceptable risks and its long-term results were satisfactory.

C16-12 THE EFFECT OF THE OFF-PUMP CORONARY BYPASS SURGERY. COMPARISON OF THE ON-PUMP CABG ON THE CLINICAL AND ANGIOGRAPHIC OUTCOMES

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Objectives: To compare the clinical and angiographic outcomes of the off-pump coronary artery bypass surgery, with the conventional CABG, using cardiopulmonary bypass.

Methods: Between January, 2005, and December, 2007, 383 consecutive, unselected patients, referred for the elective primary CABG, were randomly assigned to undergo the multiple off-pump ($n=178$, 37/20.8% women, aged 59.9 \pm 9.55) or on-pump CABG ($n=205$, 41/18.1% women, aged 59.2 \pm 8.83). The clinical outcomes were compared, and the early graft patency examination was carried out at 11.4 \pm 4.6 days after the operation.

Results: The number of grafts per patient (3.1 \pm 0.9 for off-pump CABG and 3.5 \pm 0.8 for on-pump CABG) were similar, as the number of patients with multiple arterial revascularization 26 (14.6%) the on-pump CABG and 31 (15.1%) off-pump CABG, and the completeness of revascularization -95.3% for the off-pump CABG and 92.2% for on-pump CABG. There was 1/0.6% hospital death in the off-pump group and 3/1.5% in the on-pump group. The operation time was shorter in the off-pump group -264 \pm 42 vs. 288 \pm 48 min, as well as the time of intensive unit stay 2.41 \pm 1.2 vs. 3.13 \pm 2.5 days ($P<0.05$). The incidence of perioperative complications was similar. The frequency of perioperative myocardial infarction was 6/3.4% for the off-pump CABG, and for the on-pump CABG 11/5.4% (NS). The frequency of cardiac failure (dopmin more than 5 mkg/kg/min) was 5/2.8% for the off-pump CABG vs. 18/8.8% for the on-pump CABG ($P<0.05$). Perioperative bloodless was higher in the on-pump group (731.17 \pm 289 vs. 864.4 \pm 234.7 ml) ($P<0.05$). 25/4.0% patients of the off-pump group vs. 60/29.3% patients of the on-pump group needed blood transfusions ($P<0.05$). The amount of colloids solutions required was 1067.7 \pm 355.5 of the off-pump group vs. 1593.8 \pm 432.1 ml of the on-pump group and the amount of crystalloids solutions required was 1331.9 \pm 464.9 of the off-pump group vs. 2237.5 \pm 361.3 ml of the on-pump group ($P<0.05$). Creatine kinase-MB level was lower in the off-pump group (2.82 \pm 2.5% vs. 3.45 \pm 2.1%) ($P<0.05$). Graft patency was evaluated by CT coronary angiography in 86/48.3% patients of the off-pump group and in 93/45.4% patients of the on-pump group. The overall early graft patency rate was 93.8% of the off-pump group and 94.5% of the on-pump group. The IMA graft patency rate was 99.2% of the off-pump group and 99.3% of the on-pump group (NS).

Conclusions: Off-pump CABG is as safe as the on-pump CABG with similar completeness of revascularization and the early graft patency. The clinical

outcome and time of intensive unit stay is better for the patients after off-pump CABG.

C16-13

QUALITY OF LIFE IN PATIENTS TWO YEARS AFTER CORONARY ARTERY BY-PASS SURGERY

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Objectives: Examination of the postoperative quality of life, two years after coronary artery by-pass surgery (CABG).

Methods: We administered the Nottingham Health Profile Questionnaire part 1 in a consecutive series of patients (243 patients, 195 men) who underwent elective CABG. It contains 38 subjective statements divided into six sections: physical mobility, social isolation, emotional reaction, energy, pain and sleep. The questionnaire was distributed before and two years after CABG, to all patients. One hundred and eighty-three patients filled in the postoperative questionnaire.

Results: The comparison between mean preoperative and postoperative scores two years after operation showed an improvement in all section of quality of life ($P<0.01$). Before CABG, quality of life in all sections was significantly worse in patients with higher NYHA class ($P<0.01$). CCS class of angina pectoris and NYHA functional class was significantly improved after CABG. The NYHA class were 2.29 ± 0.62 at baseline and improved to 1.61 ± 0.68 ($P<0.001$) two years after CABG.

Conclusions: In comparison with preoperative period, two years after CABG quality of life was significantly better in most patients, in the all examined sections.

C16-14

EVIDENCE THAT NEUTROPHIL ACTIVATION IS ATTENUATED DURING CARDIOPULMONARY BYPASS IN THE NEW MILLENNIUM

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Objectives: A systemic inflammatory response (SIR) is associated with on-pump cardiac surgery. Blood neutrophil (PMN) activation is a key participant and a sensitive marker in SIR. Medical management of coronary artery disease (use of statins, ACE inhibitors) and improved biocompatible extracorporeal circuits are known to attenuate SIR. With these medical improvements does healthcare delivery in the new millennium affect CPB-induced inflammation. To address this question, we compared cardiopulmonary bypass (CPB) induced PMN activation in two elective CABG studies, one performed in the 1990's and the other performed in the first decade of the new millennium.

Methods: A pilot study (1996-1997, 13 patients) was compared to a prospective, randomized study (2002-2004, 41 patients). The earlier study aimed to determine the temporal response of PMN activation during CPB surgery at our institution. The recent study aimed to determine if CPB-induced PMN activation is reduced using Poly (2-methoxyethylacrylate) (PMEA)-coated circuits, described as better biocompatible circuits, rather than non-coated circuits. To assess neutrophil activation, PMN CD11b expression and PMN Reactive Oxygen Species (ROS) production were measured in whole blood before, during and after elective on-pump CABG surgery.

Results: Preoperative and intra-operative data were similar in both studies with the exception that a much larger proportion of patients used statins and ACE inhibitors in the contemporary study (respectively 76% and 61% vs. 33% for both drugs in the pilot study). A significant acute PMN activation was observed during surgery in the pilot study (intra-op PMN CD11b expression 2.5 times greater, $P<0.001$ and PMN ROS eight times greater than pre-op, $P<0.001$). Also, the hyperleukocytosis ($\times 10^3/\text{mm}^3$) and neutrophilia ($\times 10^3/\text{mm}^3$) continued to increase post CPB (respectively 17.0 ± 2.2 vs. 6.7 ± 0.6 , $P<0.001$ and 11.7 ± 1.4 vs. 4.2 ± 0.4 , $P<0.001$). In contrast, neither PMN CD11b, PMN ROS nor the hyperleukocytosis increased in the contemporary study in either coated or uncoated groups.

Conclusions: A significant CPB-induced PMN activation occurred in the earlier pilot study, but not in the contemporary study. We speculate that

improvement in patient management, particularly with regard to pre-op medications, may blunt the inflammatory response induced by CPB.

C16-15

CORONARY ENDARTERECTOMY FOR DIFFUSE CORONARY ARTERY DISEASE - WHAT HAVE WE LEARNED AFTER 25 YEARS?

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Objectives: During the last decades the application of percutaneous coronary intervention methods has contributed to select patients with less attractive anatomical substrate for surgery. Thus, there are an increasing number of patients with advanced and diffuse coronary artery disease (CAD) requiring coronary artery bypass grafting (CABG) surgery. Coronary artery endarterectomy (CAE) still remains one of the most controversial methods in cardiac surgery. We have evaluated our institutional experience of more than 25 years, to redefine the role of CAE for treatment of diffuse CAD.

Methods: During the 26-year period (1981-2006), 21302 patients (patients) had CABG procedures, including 1458 cases of CAE (6.84%). The mean age of the patients was 64.7 ± 7.5 years, and 1047 patients (71.8%) were men. Eight hundred and forty-two patients (57.6%) had sustained previous myocardial infarction, and ejection fraction of $<30\%$ was registered in 30.4% of patients (431/1458). Triple vessel disease was detected in 1211 patients (83.1%), left main stenosis in 191 (13.1%), and unstable angina in 526 (36.1%) patients, while 931 (63.9%) patients were in NYHA class III or IV. For the left coronary artery system we have used extensive open CAE, with long arteriotomies. Coronary artery bed of endarterectomized coronary arteries has been reconstructed with an autologous vein patch completed by ITA grafting onto the patch or with an on-lay ITA patch. For the right coronary artery we preferred closed CAE (converted to the open one, if necessary). Single vessel CAE was performed in 1109 (76.1%) patients, double in 272 (18.6%) and triple in 77 (5.3%) patients. Myocardial protection was achieved by repeated doses of cold, crystalloid or blood cardioplegic solution combined with topical cooling (ice slush) of the heart.

Results: Hospital mortality was 5.8% (84/1458) and the postoperative infarction rate was 9.8% (143/1458). Inotropic support was necessary in 17.5% of patients (255/1458) and 6 patients (0.4%) required mechanical circulatory support beyond the intraaortic balloon pump. After a mean follow-up of 123.6 months (8-253), the actuarial survival rates were 82%, 70.5% and 61.5% at 5, 10 and 12 years, respectively. Freedom from recurrent angina was 83.5%, 73.3% and 63% at 5, 10 and 12 years, respectively. There were 53 redo procedures during the follow-up period, with a mortality of 7.5% (4/53).

Conclusions: The results have supported CAE to be a worthwhile procedure in patients with diffuse CAD, despite somewhat higher hospital mortality and postoperative morbidity.

C16-16

ATRIAL ARRHYTHMIAS IN PATIENTS WITH UNCLOSED ASD

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Objectives: Atrial arrhythmias have been reported to occur at a rate of 14-22% in patients with unclosed ASD.

Methods: Fifty-two adult patients with secundum type ASD were operated in our clinic between January 2001 and December 2007. Mean age was 35.63 ± 12.4 (range 18-60 years) where 37 were female (71.2%) and 15 were male (33.3%). Group I included 37 patients (71.2%) between the age of 18-40 and Group II included 15 patients (28.8%) between the age of 40-60, where the mean age was 29.30 ± 7.3 years in the former and 51.27 ± 7.45 years in the latter. In the preoperative period 41 (78.9%) patients had sinus rhythm and 11 (21.1%) had AF. Preoperative AF was observed in 2 patients in Group I (5.4%) and in 9 (60%) patients in Group II and it was statistically significant incidence of the AF between Group I and Group II ($P=0.001$).

Results: All operations were performed by means of standard cardiopulmonary bypass with the use bicaval venous and ascending aortic cannulation. For myocardial protection moderate systemic hypothermia was used with antegrade potassium enriched isothermic blood cardioplegia. Three of 11 patients who had preoperative atrial arrhythmia were receiving amiodarone, three were receiving digoxin and one was receiving calcium channel blocker as the antiarrhythmic drug therapy. The remaining four patients weren't receiving any antiarrhythmic drug. As the antiarrhythmic treatment in those with AF, amiodarone was administered to patients following cardiopulmonary

bypass (CABP) at a loading dose of 5 mg/kg (at 20-30 min), at a maintenance dose of 10 mg/kg (at 24 h), at an oral dose of 200-400 mg/day for the first three months and at an oral dose of 200-400 mg/day during follow-up in patients with continued AF. Four (36.3%) of 11 patients with preoperative AF converted to sinus rhythm in the postoperative period. AF continued in the other seven patients (63.7%) in the postoperative period despite the antiarrhythmic therapy. Two of seven patients with postoperative AF converted to sinus rhythm in the follow-up.

Conclusions: It is possible that atrial arrhythmias may continue or reoccur following the ASD closure and atrial arrhythmias may result in significant rates of morbidity and mortality. Since surgical closure of ASD in adult patients with secundum type ASD result in regression of clinical symptoms and decrease in morbidity and mortality rates ASD must be closed as soon as possible, hence it appears to be an effective method in decreasing morbidity and mortality rates.

C16-17

A SIMPLE AND SAFE TECHNIQUE TO MANAGE THE INTERNAL MAMMARY ARTERY IN REDO CARDIAC SURGERY

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Objectives: The presence of patent Internal mammary artery (IMA) represents a well known technical challenge in redo cardiac surgery. Dissecting the IMA and controlling its flow during Cardioplegic delivery is an essential and standard step. This kind of manoeuvre in addition to its difficulties is associated with the risk of damaging the IMA. A new technique in which the IMA clamping is avoided was developed and used in 32 consecutive redo cases.

Methods: The following surgical technique was used in 32 consecutive redo cardiac procedures. Nineteen patients: coronary bypass grafting (CABG), 7 patients aortic valve replacement, 3 patients mitral valve replacement, 3 patients combined CABG and valve replacements. All patients were operated on electively except 4 patients 'emergency' in the CABG group. Technique: 1) No attempts to dissect or clamp the IMA. 2) Retrograde and or antegrade Cold blood cardioplegia was used continuously or in frequent intermittent doses '5-10 min'. 3) The body systemic temperature was kept at 25 °C while the aorta is clamped. Clamp time range (34-126 min).

Results: No evidence of regional ventricular wall motion changes was seen in 21 patients (clamp time 34-98 min). Eleven patients (clamp time 73-126 min) developed various degrees of global hypokinesia and required inotropic support. One patient required intra aortic balloon pump. Two Patients required reoperation for bleeding, one patient developed sternal dehiscence. One patient died seven days post operatively of sudden stroke. These results are comparable with the reported ones in the standard approved cardiac surgery literature.

Conclusions: These results showed the technique of avoiding the IMA clamping during redo cardiac surgery is: 1) safe; 2) not only simplify the surgery but also reduces the chance of injuring the IMA.

C16-18

CONGENITAL MITRAL VALVE INSUFFICIENCY REPAIR AND LONG-TERM RESULTS

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Objectives: The aim of this study was to describe the congenital mitral valve insufficiency repair and long-term results.

Methods: Between 1997-2007, 51 patients with congenital MV insufficiency underwent valve repair. The mean age was 17 years (range from 4 months to 62 years). All patients had isolated MV malformation. The morphologic pathological findings were divided by Carpentier (1983) classification. I type - normal leaflet motion. There were 32 (62.7%) patients with annular dilation, 30 (58.8%) - with cleft leaflet. II type - prolapsed leaflets - there were 24 (47.0%) patients. III type - restricted leaflet motion, abnormal papillary muscles - there were 3 (5.9%) patients. MV regurgitation was grade III-IV in 34 (66.7%) patients, II - 17 (33.3%) patients. Four (7.8%) patients were in NYHA class IV, 27 (52.9%) - in class III, 20 (39.2%) - in class II. Associated cardiac anomalies were presented in 20 (39.2%) patients. Mitral valve anuloplasty underwent 32 (62.7%) patients, 20 (39.2%) of them by Frater, 4 (7.8%) - by Reed and 8 (15.7%) patients using prosthetic ring. It was performed 59 valvuloplastic procedures: 30 (50.8%) - cleft leaflet was corrected by a direct

suture, 29 (49.2%) other valvuloplastic procedures. One patient had chordal transposition procedure. Three patients had chordal shortening and two - papillary muscle splitting procedures.

Results: Postoperative mortality was 3.8% (n=2) from acute cardiac failure. Follow-up was from 8 months till 23 years (the mean -6.9 years). 37 (72.5%) patients were in NYHA I-II. At the latest echocardiography follow-up, trivial or less mitral regurgitation was observed in 39 (76.4%) patients, severe regurgitation - in 8 (15.6%) patients. Late operation was required in 6 (11.7%) patients, 4 (7.8%) of them - mitral valve replacement, 2 (3.9%) of them - mitral valve re-repair because of residual mitral insufficiency. During the follow-up, 1 (1.96%) patient died from left ventricular failure. Actuarial survival at five years was 90%. In the repair group, actuarial freedom from re-operation was 83% at five years period.

Conclusions: In the most cases, one patient has more than one morphological mitral valve malformations. It should be performed several MV repair procedures to have full MV reconstruction. As the malformation usually implies several anomalies, several techniques are used in the same patient with satisfactory clinical and echographic long-term results.

C16-19

INTRAOPERATIVE ABLATION WITH THE USE OF MEDTRONIC CARDIOABLATE RF AND ESTECH COBRA RF SYSTEMS IN PATIENTS WITH PERMANENT ATRIAL FIBRILLATION TREATED FOR MITRAL VALVE DEFECT. PRELIMINARY REPORT

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Objectives: The aim of the study was the comparison of the results of intraoperative ablation with the use of Medtronic Cardioablate RF and Estech Cobra RF systems in patients with permanent atrial fibrillation and concomitant mitral valve defect (MVD).

Methods: Between 2004-2005 the intraoperative ablation was performed in 26 patients with permanent AF subjected for cardiac surgery due to MVD (group 1). The mean age of patients was 60.1±10.4 (range 43-73). There were 18 (69%) women and 8 (31%) men. The isolated mitral stenosis was diagnosed in 12 patients (46%), mitral regurgitation (III/IV degree) in 4 (15%), mitral stenosis and regurgitation in 10 (39%), tricuspid regurgitation (III/IV degree) in 8 (31%) and tricuspid regurgitation of IIIrd degree in 6 patients (23%). The ablation was performed using the intraoperative Medtronic Cardioablate Surgical Ablation System. Between 2005-2007, the intraoperative ablation was performed in 28 patients with permanent AF subjected for cardiac surgery due to MVD (group 2). The mean age of patients was 65.1±12.2 (range 42-79). There were 17 (61%) women and 11 (39%) men. The isolated mitral stenosis was diagnosed in 18 patients (64%), mitral stenosis and regurgitation in 10 (36%), tricuspid regurgitation (III/IV degree) in 8 (28%) and tricuspid regurgitation of IIIrd degree in 12 patients (43%). The ablation was performed using the intraoperative ESTECH COBRA RF System.

Results: The main inclusion criterion was permanent AF lasting for at least six months. The ablations were performed by the same team of cardiac surgeons. In the group 1 sinus rhythm (SR) was observed in 16 patients (62%) early postoperatively, in 17 (69%) at the time of hospital discharge and in 18 patients (73%) after mean 18 months (12-24 months). One patient (3.8%) required the implantation of pacemaker due to temporary nodal rhythm with the slow action of ventricles. In 3 patients (11.5%) we observed intermittent and in 4 (15%) permanent AF. In the group 2 SR was observed in 22 patients (78%) early postoperatively, in 21 (75%) at the time of hospital discharge and in 22 (78%) after mean 12 months (6-18 months). In 5 patients (18%) we observed slow intermittent and in one (4%) permanent atrial fibrillation.

Conclusions: The intraoperative ablation in patients with permanent AF with concomitant mitral valve defect is a safe method allowing in most cases to effectively restore the SR, The comparison of obtained results suggests that ESTECH COBRA RF System is more effective in this group of patients.

C16-20

CLINICAL IMPACT OF INEVITABLY APPLIED EXTRACORPOREAL LIFE SUPPORT SYSTEM AFTER THE ADULT CARDIAC SURGERY

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Objectives: There have been some clinical analysis about inevitably applied Extracorporeal life support system after congenital heart surgery but there

has been few data of that after adult cardiac surgery. We tried to analyze the clinical effect, especially survivor rate, morbidity, hospital course, risk factor etc. of inevitably applied ECLS after the adult cardiac surgery.

Methods: From March 2002 to June 2007, a total of 25 patients (mean age 58.4±14.7 (20-73 years) male:female=15:11) that underwent inevitably installed ECLS after adult cardiac surgery (persistent intraoperative weaning failure 15, post operative refractory arrest against CPR 4, or malignant arrhythmia 4, or bleeding 1) were enrolled the present study. Patients who had ever temporarily succeeded the CPB weaning ($n=6$) or returned vital sign after CPR ($n=2$) or adult congenital heart disease ($n=2$) were all excluded. After the approving of Institutional review board and Ethic Committee, retrospective medical record review was performed.

Results: There were 15 cases (57%) of Valve surgery, 6 cases (23%) of CABG and 4 cases (15%) of combined surgery. Preoperatively, among the 25 patients, 10 patients have A fib, 4 patients have AMI, 7 patients have pulmonary edema, 5 patients have hepatic failure. Emergency operations were performed on 12 patients and 1 case was arrested state. Ten patients had been undergoing ICU care preoperatively. Fifteen cases (57%) of ECMO and 15 cases of VAD (7, LVAD and 8, RVAD) were applied for the study group. Mean install duration was 5.4±3.1 (1-11) days and in four patients, ECLS were applied more than 2 times during same period. Of the 25 patients, initially 14 patients weaned the ECLS. But of these 14 patients four patients eventually expired because of pneumonia and acute renal failure, ARDS. Ten patients (38.5%) were survived. Mean hospital stay time for the survivors were 91.7±29.5 (46-143) days. Univariate analysis showed VAD applied patients and none of coronary surgery. ($P<0.05$) were factors for survival.

Conclusions: The survivor rate of inevitably applied ECLS after adult cardiac surgery was near 40% so aggressive use of ECLS should be warranted. Choice of modality was somewhat important in our study population so, a larger clinical study is required. Even though 40% of patients were survived, their hospital stay time was extremely long and quite a number of patients were dead even if they weaned from ECLS because of other morbidity, so delicate and thorough care should be warranted.

C16-21A

DEXMETETOMIDINE PRODUCES DUAL ALPHA2-ADRENERGIC AGONIST AND ALPHA1-ADRENERGIC ANTAGONIST ACTIONS ON HUMAN ISOLATED INTERNAL MAMMARY ARTERY

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Objectives: To investigate the direct effects of dexmedetomidine (DEX) on isolated human internal mammary artery (IMA).

Methods: DESIGN: In vitro experimental study. SETTING: Cardiovascular Pharmacology Laboratory, Department of Pharmacology, Gulhane School of Medicine, Ankara, Turkey. PARTICIPANTS: IMA segments were obtained from 18 patients undergoing coronary artery bypass surgery. INTERVENTIONS: The response in IMA was recorded isometrically by a force displacement transducer in isolated organ baths. DEX-induced contractions were tested in the presence of the alpha2-adrenoceptor antagonist yohimbine (10 (-7) mol/l) and the alpha1-adrenoceptor antagonist prazosin (10 (-8) M). The effect of DEX (10 (-7), 10 (-6), and 10 (-5) mol/l) on phenylephrine (10 (-9)-3x10 (-4) mol/l)-induced contractions was also tested.

Results: DEX (10 (-9) mol/l-3x10 (-5) mol/l) caused contraction in IMA segments. The contraction at lower concentrations of DEX (10 (-9) mol/l-3x10 (-7) mol/l) was attenuated by yohimbine (10 (-7) mol/l), whereas prazosin (10 (-8) mol/l) attenuated the contractions at higher concentrations of DEX (10 (-6) mol/l-3x10 (-5) mol/l). Incubation of IMA segments with high concentrations of DEX (10 (-6) mol/l and 10 (-5) mol/l) caused an inhibition of phenylephrine (10 (-9) mol/l-3x10 (-4) mol/l)-induced contraction.

Conclusions: These data suggest that DEX causes contraction by activating alpha2-adrenoceptors at lower concentrations, but it may also activate alpha1-adrenoceptors at higher concentrations in IMA. The action of DEX on phenylephrine-induced contraction may be related to an alpha1-adrenoceptor antagonistic effect produced via partial alpha1-adrenoceptor agonistic action.

C16-21B

LONG-MEDIUM TERM FOLLOW-UP OF ST. JUDE SILZONE VALVE PROSTHESIS

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Objectives: Many authors had related many problems (dehiscence, thromboembolism, etc.) on the St. Jude Silzone prosthesis follow-up due to the silver compound covering its ring. Our goal was to study if elective prosthetic replacement as a real alternative.

Methods: From January 1998 to December 2000, sixty-one patients received 70 prosthesis in 62 procedures. Twenty-six patients received 27 mitral prosthesis (one patient was operated twice), 29 received an aortic prosthesis and seven patients suffered a double valve replacement. Thirty-five patients were male and 26 were female. The mean age of the patients was 53.2±6.1 years. Sixty-eight percent of the patients were in sinus rhythm. Five of them died within the 30 first days of operation (4.8% mortality). The 58 discharged patients were followed for a minimum of seven years and a maximum of 10.3 years (504.3 patients/year). The follow-up was completed in 98.6% of the patients.

Results: Six patients died in this follow-up period, four of them within the first 18 months after discharge. In five patients, (four aortic and one mitral) severe paravalvular leakage was detected. Three of the four aortic leakages should be reoperated and two of them had an initial diagnosis of endocarditis. Five patients had thromboembolic episodes and another patient presented mitral thrombosis and suffered emergent prosthesis replacement. All the six thrombosis episodes happened within the first 18 months of follow-up. In our series, the St. Jude Silzone prosthesis presented an elevated rate of leakage (8.6%) and thromboembolism (10.3%) and most of these complications happened in the early follow-up period. The prosthetic replacement rate due to leakage or thrombosis is also elevated (6.8%).

Conclusions: Silzone does not protect against endocarditis. It has a high complications rate. However, as the majority of the patients have overcome the most dangerous period, the first 18 months of follow-up, we do not consider elective prosthetic replacement as a real alternative after this time.

C16-22

THE INCIDENCE OF SPASM IN PROXIMAL VS. DISTAL COMPOSITE RADIAL ARTERY GRAFTS

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Objectives: Despite the variance of the histological architecture of the radial artery along its course, no clinical data are available concerning the usage of proximal versus distal parts of radial artery. This study aims at comparing the incidence of spasm in proximal and distal segments of the radial artery.

Methods: A total of 56 patients who had isolated coronary artery bypass grafting (CABG) between January 2004 and December 2006 were evaluated. They were divided into two groups; group A (27 patients) where proximal radial artery was used and group B (29 patients) where distal radial was used. Preoperative patient characteristics, operative and postoperative data were evaluated. Patients were followed-up at six months intervals. Assessment of the symptoms, ECG, thallium scintigraphy and coronary angiography were done.

Results: The incidence of radial artery Spasm was significantly lower in group (A) ' $P=0.0431$ '. There was no statistically significant difference between the two groups as regards the incidence of wound complications, low cardiac output, arrhythmias and systemic complications. The perfect patency rate of distal radial artery grafts was lower than that of the proximal RA (24/25 vs. 23/26).

Conclusions: The use of proximal Radial artery in CABG is preferable to its distal segments.

C16-23

DIABETIC PATIENTS SHOULD HAVE INTERNAL THORACIC ARTERY HARVESTED SKELETONIZED

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Objectives: To analyse the impact in the sternal perfusion by cintilography, when bilateral internal thoracic arteries (ITA) were used by two different techniques.

Method: Thirty-five patients submitted to coronary artery bypass grafting (CABG) were divided into two groups: Group A (18) had both ITA harvested as skeletonized and group B (17) as pedicled. On the 7th post-operative day patients were submitted to bone cintilography of the sternum. A quantitative and qualitative analysis of the images were performed. Statistical analysis was calculated using student *t*-test.

Results: Group A (skeletonized) showed higher perfusion (11.5%) of the sternum as a mean, than Group B (pedicled) patients, however, this was not statistically significant ($P=0.127$). On the other hand comparing the diabetic population, seven in each group, there was a marked 47.4% higher perfusion of the sternum in Group A patients comparing to Group B and this difference reached statistical significance ($P=0.004$).

Conclusions: 1 - Sternal perfusion is not affected significantly independent of the technique used to harvested both internal thoracic arteries in the general population. 2 - In the diabetic population a significant preservation of the perfusion of the sternum is observed whether both internal thoracic arteries are harvested skeletonized.

C16-24

BILATERAL SKELETONIZED INTERNAL MAMMARY ARTERIES: IN SITU GRAFTS FOR MYOCARDIAL REVASCLARIZATION

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Objectives: Bilateral internal mammary artery (BIMA) has been proposed to improve long-term results in coronary artery bypass grafting (CABG). However, there are specific conditions (low ejection fraction, diabetes, chronic obstructive pulmonary disease (COPD) et cet.) traditionally accepted as a limiting factors for usage of BIMA in CABG. This study presents our initial results with in situ skeletonized BIMA in CABG.

Methods: There were 94 patients with skeletonized BIMA in CABG procedures operated on between August 15, 2003 and November 1, 2007. Skeletonized IMA was harvested with blunt dissection and gentle operative technique. Right IMAs were used for right coronary artery, and left IMAs for left coronary system. There were 78 (83.0%) male and 16 (17.0%) female patients, with an average age of 55.2 years. All IMAs were used as in situ grafts. Fourteen patients (14.9%) were diabetics, 25 patients (26.6%) had COPD, and 9 patients (9.6%) had ejection fraction <30%. In 20 patients (21.3%) radial artery was used in addition to BIMA to achieve total arterial revascularization.

Results: There were no postoperative morbidity and mortality (30 days after surgery). The average length of stay was eight days.

Conclusions: Bilateral skeletonized IMA could be successfully used as an in situ conduit for CABG, especially if total arterial revascularization is preferred. IMA harvesting with skeletonized technique provides better IMA length, detailed graft visualization, and minimal trauma to the chest wall. This operative technique makes previously described limitations for usage of BIMA in CABG irrelevant.

C16-25

AAI PACING IS SUPERIOR TO A.V SEQUENTIAL PACING POST CORONARY ARTERY BYPASS GRAFTING

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Objectives: A.V sequential pacing is considered the gold standard to date. We investigated if AAI pacing is superior to dual chamber pacing in patients with normal A.V Conduction.

Methods: Twenty consecutive post coronary artery bypass grafting patients with a heart rate <70/min were selected. Comparative analyses of their cardiac output and graft flows were performed using the following pacing modalities-AAI, DDD, Bi VENTRICULAR, VVI. In all pacing modes the rate was kept at 85 beats/min. Data acquired was statistically analyzed using the non-parametric analysis, Wilcoxon Sign-Rank test.

Results: AAI was superior to patients own rate and VVI pacing mode both in the graft flows ($P<0.001$, $P<0.008$) and cardiac output ($P<0.001$, $P<0.005$) respectively. The cardiac output of patients who were paced AAI mode was significantly higher than on DDD mode ($P<0.02$), however, the graft flows were not statistically significant.

Conclusions: This study highlights that AAI pacing is the ideal mode of pacing in patients who have preserved A.V Conduction to optimize their cardiac output.

C16-26

COMPARISON OF THE EFFICACY OF POLISH RISK SCORE (PSR) WITH THE COMMON USED SCORES IN THE GROUP OF POLISH PATIENTS OF HIGHEST RISK UNDERWENT SURGICAL REVASCLARIZATION

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Objectives: Commonly used scores of surgical risk in cardiac surgery were founded as a result of wide multicenter researches, however, in none of them Polish patients were included. Thereby the aim of our study was to select the most important risk factors in Polish population patients, and to compare the created SCORE with the international scores (EuroSCORE and Cleveland Clinic Foundation) commonly used in Polish departments of cardiac surgery.

Methods: The research was performed prospectively in 12 Polish cardiosurgical centers between October 2003 and June 2005, in the group of 4653 patients (male: 74.19% and female: 25.81%) aged between 29-87 years (mean: 61.64 ± 9.17), subjected to isolated surgical revascularization. The inclusion criteria to the group of patients of highest risk were as follows: 10 points in PSR SCORE ($n=200$) (PSR group), six patient. in EuroSCORE ($n=1094$) (EuroSCORE group), and seven patient in Cleveland Clinic Foundation score (CCF) ($n=291$) (CCF group).

Results: Three scores of risk were evaluated: two commonly used - Cleveland Clinic Foundation (CCF) (Higgins et al., 1992) and EuroSCORE (Nashef et al., 1999) and Polish Score of Risk (PSR). The efficacy of scores was evaluated with the application of AUC - area under the receiver operating characteristic (ROC) curve. The obtained results for the particular scores in these three groups of high risk patients were as follows: PSR group: PSR=0.755, EuroSCORE=0.686, CCF=0.609; EuroSCO group: PSR=0.758; EuroSCORE=0.717; CCF=0.602; CCF group: PSR=0.908; EuroSCORE=0.793; CCF=0.706.

Conclusions: Irrespective of the score on the basis of which the highest risk patients were selected, the highest ROC curve with the largest area under the curve was calculated for PSR SCORE. It incontestably means that PSR SCORE discriminates the Polish patients against deaths in the most significant way.

C16-27

SMARTCANULA PERFORMANCES AND VENOUS DRAINAGE IN HIGH-RISK PATIENTS UNDERGOING COMPLEX CARDIO-VASCULAR PROCEDURES AND REDO OPERATIONS

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Objectives: Devices for the peripheral venous cannulation have seen significant progress over time. Standard rigid steel cannulas have evolved towards flexible plastic cannulas with wire supports and, during the last twenty years, the percutaneous approach has been developed successfully. In contrast to all the rectilinear venous cannula designs, which presents the same cross-sectional area over their entire intravascular path, the Smartcanula concept of collapsed insertion and expansion in situ is the logical next step for peripheral venous cannulation.

Methods: Surgical femoral peripheral venous cannulation using the longest Smartcanula (63 cm) was successfully established in a series of 27 patients operated between January 2005 and October 2007 and undergoing redo cardiac-procedures, minimal invasive or high risk cardiac/cardiovascular interventions. The Smartcanula performances were assessed comparing the calculated target pump flow and the pump flow achieved during the operation.

Results: Twenty-seven patients (mean age 50 ± 18 years) have been successfully operated in our institution (mortality 0%). A peripheral venous cannulation using the 63 cm length Smartcanula via the femoral vein was surgically achieved in all patients without complications. The mean body surface area was 1.82 ± 0.27 m². The calculated mean target pump flow (2.4 l/min/m²) was 4.40 ± 0.50 l/min and the mean achieved pump flow during cardiopulmonary bypass was 4.94 ± 0.35 l/min or 12.3% more than expected.

Conclusions: Peripheral venous cannulation using the Smartcanula is safe and feasible in high-risk patients undergoing redo, complex or minimal invasive cardiac and cardiovascular operations. Advantages are the reduced atrial chatter, the reduced kink resistance in situ and an improved blood drainage without active suction and despite smaller access orifice size.

C16-28

MIDTERM RESULTS AFTER AORTIC VALVE REPLACEMENT WITH LABCOR-A-TLPB

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Objectives: Aortic valve replacement is an established therapy in patients with severe aortic valve stenosis. In elderly patients a bio-prosthesis is used usually. The LABCOR TLPB aortic valve has been implanted since 15 years but mid- and long-term results are not published. We observed patients after

aortic valve replacement with the low profile designed prosthesis LABCOR TLPB. We paid attention to clinical and physical data.

Methods: In a retrospective analysis we observed 92 patients with aortic valve replacement. We recorded the clinical data, adverse events in the hospital stay and during a follow-up of two years. We compared the data from preoperative and postoperative echo especially the transvalvular gradients. Follow-up was made by phone calls and standardised forms.

Results: Ninety-two patients (43 men; 46%) with a medium age of 76.6 years (70-86 years) received a LABCOR TLPB aortic valve between March 2006 and August 2007 (emergency 23 patients, elective 69 patients). Forty-seven patients (51.1%) have got an aortic valve replacement only. In 45 patients the operation was combined with different procedures (CABG=39 patients, 42%; other=6 patients, 6.5%). The additive and logistic EuroSCORE was 7.8 and 10.0%. The in-hospital mortality was 4.3% (elective 2.89%, emergency 8.69%). Severe neurological deficits occur in 5.4% (elective 4.34%; emergency 8.69%). Dialysis was necessary in five patients (5.4%). The mean transvalvular gradients decreased on average from 50 mmHg (S.D.±17.5 mmHg) to 18 mmHg (S.D.±6.2 mmHg). The mean follow-up was 313 days (S.D.±150 days). A complete follow-up was possible in 100%. Readmission occurred in two patients (2%) in cause of a minimal paravalvular leak. A valve related redo-operation was not necessary.

Conclusions: An aortic valve replacement with LABCOR TLPB in elderly patients showed good midterm results. The LABCOR TLPB aortic valve in elderly patients is a good alternative to other bio-prosthetic valves. We did not see a valve related problem. Definitive conclusions will be made after long-term follow-up.

C16-29

LONG-TERM EXPERIENCE FOR PERCUTANEOUS MITRAL VALVULOPLASTY FAILURE

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Objectives: Percutaneous mitral valve balloon valvuloplasty (PMV) is currently the treatment of choice for rheumatic stenosis but as a palliative treatment a significant number of patients will required a open heart operation.

Methods: From 1985 to 2007, 616 patients underwent percutaneous mitral valvuloplasty. From this series of patients 143 (23.2%) required a open heart procedure for PMV failure. Early PMV failure was the indication of surgery in 34 patients (23.8%) and late PVM failure in 109 (76.2%). The causes for surgical indication were cardiogenic shock in 14 patients (9.8%), technical problems in 21 (14.7%), mitral insufficiency in 41 (28.7%) and progression of the rheumatic disease in 86 (60.1%).

Results: Surgery consisted in mitral valve replacement (n: 125, 87.4%) or repair (n: 18, 12.6%). Associated surgery was repair of cardiac chambers lesions in 38 patients (26.6%) tricuspid valve intervention in 52 (36.3%), aortic valve replacement in 33 (23.1%) or CABG in 7 (4.9%). Hospital mortality was 7.0% (10 patients) and mean duration of in-hospital stay was 14.1±10.9 days.

Conclusions: Failure MVP is a iatrogenic disease with different characteristics. The technical failure has been more frequently in the initial experience, whereas the progression of the rheumatic disease is the most common cause for surgical indication. The ability of mitral valve repair in a valve previously dilated diminish considerably. The high incidence of associate surgery shows a different criterion used to indicate valvuloplasty or surgery.

April 26th, 2008 3rd Congress Day

16:30-18:00

9th Vascular Scientific Session - Veins-Vascular Access and Miscellaneous

V9-1

MANAGEMENT OF PROSTHETIC GRAFT INFECTIONS WITH THE USE OF HOMOGRAFT VESSELS

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Objectives: The prosthetic graft infection is one of the most challenging complication in vascular surgery. There are lots of methods to cope with this situation, but a gold standard does not exist until now. Our aim was to examine our mid-term results using human cryopreserved vessels treating prosthetic graft infection.

Methods: Our clinic established in 1997 a non-profit homograft vessel bank. In the last ten years 40 patients were treated with prosthetic graft infection, 45 grafts were implanted. Twenty patients had aortoiliac reconstructions in their history, 25 cases were operated on the femoropopliteal region. The previous operation were performed on the average of 42.8 months earlier. Almost the half of the patients were treated under emergency circumstances, among them eight had aortoduodenal fistulas and nine septic bleedings. Different types of aortoiliac and femoropopliteal operations were done, 30 cryopreserved arterial grafts and 15 venous graft were used. Patients underwent most often crossover bypasses and femoro-distal bypasses. Blood type incongruence were observed in 33 cases. The bacterial test revealed nine different species, staphylococcus aureus grew in seven cases, but Gram-bacterias played also a remarkable role.

Results: In the postoperative period seven patients suffered from septic bleeding, six patients died. Eighty-five percent of the patients were dismissed, 8 with peripheral pulse, 19 with claudication, and 6 with occluded grafts. The patients who were admitted with septic bleeding (9) had a bigger chance to suffer a septic bleeding again (5 of them) and to die (3). The six lethal outcome was associated with aortoduodenal fistula (3 cases) and previous septic bleeding (5 of 6 patients). Also were typical a higher proportion of aggressive Gram-bacteria among the deceased patients. The survived patients had a follow-up period of 20.4 months. Kaplan-Meier analysis revealed 71% infection free rate of patients after 36 months.

Conclusions: Prosthetic graft infection is associated with a high rate of different septic bleedings due to aggressive Gram-bacteria. These cases has a significant higher mortality rate, too. Homograft vessels offer an immediately available biological option to cope with this serious condition. Homograft implantation proves a tolerable infect free period for patients who survive the graft exchange.

V9-2

VASCULAR PROSTHESIS INFECTION IS STILL A MAJOR CHALLENGE

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Objectives: Vascular prosthesis infection represents a serious complication. Although the chance of developing vascular prosthesis infection is relatively low (0.6-2.3%), mortality rises up to 25-75%. Diagnostic and therapeutic strategy may be complicated by the heterogeneity of the problem. In this study we analyzed our experience with this feared complication and present the results of its treatment.

Methods: Data of all patients treated for vascular prosthesis infection in a tertiary referral center between 1997 and 2007 were retrospectively analyzed. Prostheses in the aortic tract from the level of the thoracic aorta to the femoral arteries were included. Arteriovenous shunts were excluded. Clinical data were collected by consulting the hospital medical information system.

Results: In the study period, a total of 50 patients were treated, 38 men and 12 women with a mean age of 73 years (range 45-92). In 80% of cases central reconstructions were involved, the remaining cases being femoro-femoral crossover or femoropopliteal bypasses. Mean infection-free interval after the primary operation was three years (range 0-25 years). Fever and swelling were symptoms most frequently encountered. In 74% of cases, causative microorganisms could be isolated, 36% of them deriving from the prosthetic material itself. Causative agents included coagulase-negative staphylococci (38%) and Staphylococcus aureus (22%), as well as Escherichia coli, Pseudomonas aeruginosa, Candida albicans, Klebsiella pneumoniae and Listeria monocytogenes. The diagnosis was primarily made on the basis of clinical presentation and additional imaging, especially computed tomography scanning (66%). In 24% of cases CT-scan images were fused with positron emission tomography (PET) scan. Treatment consisted in 38% of drainage of the infected area with administration of antibiotics. Other treatment modalities included extra-anatomical bypass (18%), complete removal of the infected prosthesis and replacement with a rifampicin-drenched Dacron prosthesis (14%), as well as autologous reconstruction with superficial femoral veins (4%). Mean follow-up was three years, during which 17 patients (34%) died. Main causes of death were pulmonary (n=8) and cardiac (n=4) related.

Conclusions: Diagnosis of vascular prosthesis infection remains difficult, mainly due to heterogeneity of clinical presentation, and duration and type

of used antibiotics with decreased diagnostic sensitivity as a consequence. Fused PET-CT imaging seems promising for the near future.

V9-3

EXTERNAL ILIAC ARTERY PSEUDOANEURYSM COMPLICATING RENAL TRANSPLANTATION

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Objectives: Extrarenal pseudoaneurysms following a renal transplantation or a transplant nephrectomy are uncommon, and occur usually as a result of anastomotic defects or local infection. The aim of this study was to assess retrospectively the causes, diagnosis and the outcome of surgical or endovascular treatment of this potentially life threatening complication.

Methods: A review of all patients admitted with a diagnosis of extrarenal pseudoaneurysm after kidney transplantation over a period of 25 years (1982-2007) was carried out. Cultures of the resected sample of the pseudoaneurysm and/or allograft artery were taken in all seven surgical cases; sections were stained with either H&E and a combination of Masson's trichrome and Verhoeff's elastic stain; also sections were stained immunohistochemically for T cells (CD3, CD8).

Results: Eleven patients (male, 7) with a mean age of 46.1 years (range, 28-67 years) presenting pseudoaneurysm formation were identified. Two patients were asymptomatic, with the pseudoaneurysm being diagnosed on a routine ultrasound examination; seven patients were admitted for a pulsatile mass in iliac fossa and local pain (in three malaise and fever were detected), and the remaining two patients at presentation complained of sudden abdominal pain, vomiting and hypotension. Of these, five patients developed pseudoaneurysm at the anastomotic site and the remaining six following extracapsular transplant nephrectomy. Following proximal and distal ligation of the external iliac artery, a femoral-femoral bypass was performed in two high-grade fever patients with arterial anastomotic disruption and evidence of local infection (intraoperative cultures of the vascular bed showed the presence of *Candida albicans* and *E. coli*, respectively); of these two patients, one died from sepsis two days later. Two patients required emergency surgical exploration for control of hemorrhage (one required a simultaneous allograft nephrectomy); these two patients and five further patients underwent arterial reconstruction using a Dacron interposition graft to restore inflow into the lower limb. In recent years, three pseudoaneurysms were treated interventionally with a stent-graft. Histological examination revealed complete loss of endothelial cells, disruption of elastic fibers and fibrosis, endoluminal thrombosis, and positive staining reactions with CD3 and CD8 at level of wall of vasa vasorum.

Conclusions: This review of the management of pseudoaneurysms complicating renal transplantation showed that therapeutic option will depend on the presence or absence of infection and bleeding. Endovascular repair is a safe and minimally invasive alternative to surgical repair. Our histologic findings support the hypothesis that formation of pseudoaneurysm may be due to immunologic rejection of donor renal artery, or of the remnant vascular stump after transplant nephrectomy.

V9-4

DO WE NEED A RISK SCORE SYSTEM FOR HYBRID-PROCEDURES OF THORACOABDOMINAL AORTIC ANEURYSMS?

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Objectives: Hybrid-procedure as a combined endovascular/open approach with retrograde revascularisation of the visceral/renal vessels has been realized to minimize peri-operative complications in TAAA repair. To make the results comparable to traditional open repair, risk-stratification schemes could be applied. The aim of the study was to evaluate risk stratification scheme of the additive/logistic EuroSCORE in patients undergoing hybrid-procedures.

Methods: Within an experience of 380 aortic stent-grafts (1998-1/2008), 22 of the patients (16 men)(64 [35-78] years) with TAAA were treated with a hybrid-procedure, five patients demonstrated contained ruptures. The visceral/renal revascularization was accomplished via transperitoneal bypass grafting using the infrarenal aorta or the iliacs as donor vessel. The aneurysm (75 [70-100] mm) was subsequently excluded by stent-graft, in twelve cases as two stage procedures. In all patients risk-stratification was

performed due to the European System for Cardiac Operative Risk Evaluation (EuroSCORE).

Results: The entire procedure was technically successful in 21 patients. One man suffered bowel ischemia due to mesenteric bypass occlusion with multi-organ failure leading to death (2nd day). The operative procedure time was 360 (330-455) min. Five patients suffered from multi-organ failure leading to death at the 20 (16-42) postoperative days. All other patients were transferred from the ICU to the ward at the 4 (1-51) days. Artificial ventilatory support was necessitated in 325.5 (0-2057) h. The survivors were discharged 21 (5-47) days after the operation, while the postoperative studies revealed the patency of the vessels and no evidence endoleaks. During the follow-up (1-30 months) spiral-CT scanning revealed distinct shrinkage of the aneurysm, no graft migration or endoleak and patency of all revascularised vessels, except for one renal artery in three patients. No survivor experienced neurological deficit. Overall, additive EuroSCORE was 7.7 (mean; range, 3-13) and logistic EuroSCORE was 15.1 (mean; range, 3-46). The additive EuroSCORE as well as the logistic EuroSCORE discriminated significantly (one way ANOVA) between the survivors and lethal group (additive EuroSCORE: 6.8 [3-13] vs. 10.0 [7-13]; logistic EuroSCORE: 11.7 [2.8-45.6] vs. 24.2 [9.9-40.0]).

Conclusions: The hybrid-procedure is feasible, without cross-clamping of the aorta and with minimized ischemia time for renal/visceral arteries. It seems to be a suitable strategy even for high-risk patients with a TAAA, but the long-term durability has to be proven. The EuroSCORE seems to be a good and reliable risk-stratification score in hybrid-procedures. To compare the hybrid-procedure with open repair, forthcoming comparative studies should evaluate their cohorts by means of the EuroSCORE.

V9-5

MAGNETIC RESONANCE IMAGING (MRI) IN DIAGNOSTIC OF VASCULAR MALFORMATIONS

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Objectives: To analyze the findings of vascular malformations (VM) on magnetic resonance imaging (MRI) and to correlate these findings with duplex scanning (DS) and intraoperative date.

Methods: Results of treatment of 78 patients (mean age 25.6±10.8 years) with vascular malformations were estimated. Arteriovenous form was revealed in 34 patients (43.6%), venous form 43 (55.1%), lymphatic 1 (1.3%). Affection of neck and face was revealed in 22 patients (28.2%), upper extremities 18 (23.1%), lower extremities 34 (43.6%), trunk -1 (1.3%), affection of several zones 3 (3.8%). Extension of affection was determined by the data of clinical investigations, arteriography, DS of soft tissues and MRI.

Results: In detecting of presence of the disease sensitivity, specificity and accuracy with MRI was 98%, 98% and 98%, respectively. When revealing the form sensitivity, specificity and accuracy with MRI was 96%, 96%, 96%, respectively, in detecting of the depth and degree of affected areas - 96%, 96%, 96%, respectively, when revealing the defeat of the bones and joint - 86%, 91%, 89%, respectively.

Conclusions: Appropriate diagnosis and assessment of VM can be made on clinical findings and non-invasive studies. The basic prerequisite for a rational therapy of VM is differentiated diagnostics, especially the differentiation between arteriovenous malformations, haemangiomas and venous malformations. Angiography reveals the arterialization, arteriovenous fistulas, MRI - infiltrations of bone and soft-tissue. MRI demonstrates completely the extent of malformations because of its bright signal intensity in the T2-weighted images.

V9-6

TACTICS OF TREATMENT OF PREGNANT WOMEN AND PUERPERANTS IN CASE OF INFERIOR VENA CAVA AND ILIAC VEINS THROMBOSIS

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Objectives: According to modern researches, thrombosis of inferior vena cava and iliac veins is frequent enough complication in such a group of patients as pregnant women and puerperants. It is reported that 1.7% of pregnant women and 3.2% of puerperants have an acute phlebothrombosis. In this group 2.7% of pregnant women and 3.9% of puerperants have a lung artery thromboemboly,

which is accompanied by a high level of mortality. Approaches of treatment of these patients is still controversial in different clinics.

Methods: Since 2003 to 2007 at faculty surgical clinic of Saint-Petersburg State Medical University named after academician I.P. Pavlov 42 pregnant women and 47 puerperants with phlebotrombosis were treated. Lung artery thromboemboly had 17 (36.1%) of the puerperants. In this group 32 (76.1%) pregnant women and 23 (49%) puerperants were treated with external clipping of inferior vena cava using original clip, which was designed in our clinic. Medicamentous therapy (anticoagulants) was added in all of these cases.

Results: During four years follow-up period all of the clipped veins were passable. Special examinations did not reveal any hemodynamically significant stenoses (pressure gradient was <2 mmHg).

Conclusions: Cavaclipping with our original clip could be recommended as effective and safe surgical method for prevention of lung artery thromboemboly in group of pregnant women and puerperants with phlebotrombosis in the system of inferior vena cava.

V9-7

A PROSPECTIVE RANDOMISED TRIAL OF VNUS CLOSURE PLUS® VS. SURGERY FOR THE TREATMENT OF UNILATERAL RECURRENT LONG SAPHENOUS VARICOSE VEINS

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Objectives: This study aimed to assess the outcome of endoluminal thermal ablation (VNUS) and traditional redo groin surgery and long saphenous vein stripping in patients with unilateral recurrent long saphenous varicose veins.

Methods: This was a prospective randomised study. Twenty-two patients were randomised to VNUS plus avulsions ($n=11$, median age [range] 47 years [29-76], male: female 1:10) or traditional redo groin surgery, stripping of the long saphenous vein plus multiple avulsions ($n=11$, median age [range] 56 years [51-81], male: female 5:6). Median CEAP classification for both groups was 3. Patients completed 10 cm visual analogue scales for pain, bruising and incapacity to perform normal activities.

Results: Median follow-up was 13 months (range 2-45). Median time to perform VNUS was 30 min (range 20-65) min compared with 28 (range 10-70) min for redo groin surgery ($P>0.05$). Postoperatively, pain scores for VNUS were significantly lower than that for redo groin surgery (median 0.7 [range 0-5.4] vs. 4.0 [range 0.5-6.8], $P=0.038$). There was no significant difference in bruise scores between the groups. Incapacity scores for VNUS were significantly lower than for redo groin surgery post-operatively (median 1 [range 0-3.4] vs. 4.9 [range 0.4-7.0], $P<0.0001$). 10/11 (91%) Long saphenous veins were sealed by VNUS at Duplex follow-up. Two patients in the redo groin surgery group (groin abscess and neuralgia) and one in the VNUS group (neuralgia) had complications.

Conclusions: VNUS caused less pain than redo groin surgery. Patients who had VNUS suffered less incapacity than those who had redo groin surgery, and returned to normal activities within three days. VNUS should be considered the treatment of choice for recurrent long saphenous varicose veins.

V9-8

RECURRENT VASCULAR ACCESS THROMBOSIS - ARE DIAGNOSTIC PROCEDURES IMPORTANT?

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Objectives: Vascular access thrombosis (VAT) is the most morbid and costly complication in end-stage renal disease (ESRD) patients. Besides venous stenoses hypercoagulability is a major risk factor for VAT.

Aim of this study was to assess the incidence and diagnostic measures in recurrent VAT.

Methods: Between January 2005 and December 2007, a total of 159 operations for Vascular access thrombosis were performed in 82 patients (patients) (36 male, 46 female, mean age 64.6±12.3 (range 21-86) years). In 41 of the 82 patients (50%) only one operative procedure was necessary. Twenty patients were operated upon twice, 11 patients three times. In three female and two male patients. Four surgeries because of VAT were required, in four patients (2 female, 2 male) five operations.

Results: In one female patient a total of six thrombectomies were performed, despite this effort the AV prosthesis had to be explanted. Hemodialysis is continued via über PermCath. The patients requiring multiple surgeries

because of VAT did not differ from the overall group regarding their age (mean age 64.6±12.8 years). All patients underwent intra- or postoperative angiography, if necessary including Shunt-PTA, following the second thrombosis. In 2007 an additional hypercoagulability screening after the third VAT was added. In a 69-year-old male an MTHFR mutation and hyperhomocysteinemia were diagnosed. In 21 of 82 patients (25.9%) undergoing surgery for VAT more than two additional operations were required within the next three years.

Conclusions: Because of the increasing difficulty of creating and maintaining sufficient vascular access after numerous procedures, additional diagnostic tests to detect and treat hypercoagulability is worthwhile, even if this does not yet give the reason for recurrent VAT in the majority of patients.

V9-9

HISTOLOGICAL CHANGES AFTER ENDOVENOUS RADIOFREQUENCY THERAPY (VNUSCLOSURE/CLOSURE FAST)

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Objectives: The question about the effective treatment of the varicose veins traditionally versus endovenous with radiofrequency or laser is not clear. We know the 5-year-results from a multi-centre clinical trial of the VNUS-Closure endovenous radiofrequency (RF) vein ablation versus stripping of the great saphenous vein (surgical treatment). Long-term-results absent. Our investigations should be a contribution to objective the results after the Closure-FAST-therapy.

Methods: We take from the radiofrequency treated great saphenous vein a test about a mini-incision for histological investigations.

Results: In all our patients we see the same alterations: complete destruction of the intima layer (fresh necrosis 0.1-0.2 mm deep), denaturation of the collagen, subintimal oedema. After four weeks we see a complete obliteration of the vein and an thrombus in organisation. Immigration of granulocytes in the tissue.

Conclusions: After the Closure-FAST-therapy in varicose veins we have the histological proof for the destruction of the intima and the collagen with necrosis and destruction of the wall. The result is the complete obliteration. Long-term-results follow.

V9-10

SYSTEMIC INFLAMMATORY RESPONSE SYNDROME IN PATIENTS WITH DEEP VEIN THROMBOSIS PRODUCE SEVERE CHRONIC VENOUS DISEASE

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Objectives: Systemic inflammatory response syndrome without invading microorganisms, termed SIRS, leads to profound activation of the white blood cells, platelets and endothelial cells. The main symptoms of SIRS were good highlighted by R. Bone. Patients with deep vein thrombosis (DVT) in the early stage of the disease has different markers of SIRS characterized by a widespread and ongoing activation of leukocytes with endothelial activation and mediator release. The aim of this study was investigated the role of SIRS in patients with DVT and SIRS involvement in the clinical stage of chronic venous disease (CVD).

Methods: We observed 86 consecutive patients for five years with clinical suggestion of deep vein thrombosis of the limbs. Fifty-four (62.8%) patients had massive DVT (iliofemoral veins, vena cava inferior), female 49 (56.9%), male 37 (43.1%). Mean age was 57±12.4-years-old. Sonography with positive findings was diagnostic for DVT in all patients. All patients were followed-up daily to record the number of SIRS criteria. Patients were given a SIRS score of 0, 1, 2, 3 or 4 on each day depending on the number of SIRS criteria present. For scoring, the methodology originally described by Norwood M. et al. was used. All patients received standard heparinotherapy with warfarin and antiplatelet drugs. Mobilization with graduated elastic compression stockings were encouraged for all patients. At the end of the 5th year follow-up all patients were analyzed by scoring pain severity and edema as described in American Venous Forum severity scoring system.

Results: Sixty-nine (80.2%) patients with DVT had two and more SIRS criteria duration 4-12 days. As a result of correlation analysis all patients with duration two and more SIRS criteria after five days of the hospital stay ($n=23$) had severe pain and edema leg score (Spearmen coefficient ≥ 0.32). From these patients only three cancelled elastic stockings and did not receive any anticoagulant or antiplatelet therapy. In a group of patients with SIRS duration low then four days ($n=46$) we were noticed mild or moderate severity

score of the leg's swell and pain ($P<0.01$). In the group with duration SIRS criteria more than five days there were more cases of thromboembolic complication than in other patients 4 (17.4%) vs. 0 (0%), $P<0.05$. Hospital stay was 13.3±4 days vs. 7.4±2 days correspondingly ($P<0.001$). Conclusions: Systemic inflammatory response syndrome play a pivotal role both in the accelerating of chronic venous insufficiency and the recurrence of DVT. Duration of this syndrome is reliable correlated with severity of the pain and leg edema.

**April 26th, 2008 3rd Congress Day
16:30-18:00
10th Vascular Scientific Session - Minipresentations**

V10-1

RENAL AUTOTRANSPLANTATION AS A TREATMENT OF SEVERE RENOVASCULAR HYPERTENSION - CASE REPORT WITH 20 YEARS FOLLOW-UP

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Objectives: Renal autotransplantation is used as an alternative treatment of complex renovascular disease. In these cases endovascular technique may be ineffective and lead to ischemic injury. We present a case of patient with renovascular hypertension caused by severe atherosclerotic stenosis of renal arteries.

Methods: In 2006, 68-years-old woman was admitted to our Department due to suspected stenosis of renal artery of autotransplanted kidney. Twenty years before present hospitalization, the patient was treated due to malignant renovascular hypertension with systolic blood pressure (SBP) over 220 mmHg, caused by stenosis of both renal arteries. The surgical treatment included aorto - renal bypass (using saphenous vein) on the left side and autotransplantation of right kidney to the left iliac fossa with anastomosis to the hypogastric artery. Patient required only modification of antihypertensive drugs during next years of follow-up. There was no signs of blood flow disturbances in autotransplanted kidney in control ultrasound until two years before present admission. Doppler US showed significant stenosis of renal artery. The treatment consisted of percutaneous transluminal angioplasty (PTA) with stent insertion with good clinical outcome.

Results: During present admission, the patient had moderate hypertension (SBP 150-160 mmHg). Kidney function was not compromised, with creatinine levels within normal range. Doppler US showed no signs of restenosis. After modification of antihypertensive drugs dosage, we observed reduction of blood pressure.

Conclusions: This case demonstrates feasibility and effectiveness of renal autotransplantation as a surgical treatment of complex renovascular disease in long-term follow-up.

V10-2

IMPORTANCE OF ILOPROST IN THE TREATMENT OF BURGER'S DISEASE

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Objectives: Burger's disease is a disorder starting with distal vessel involvement in young male smokers between ages 25-35. There is no clear therapy except smoking cessation for Burger's disease. Iloprost is a prostacyclin analogue which increases microvascular blood flow and inhibites platelet aggregation. We investigated the effects of iloprost on improvement, pain relief, decrease of analgesic necessity and amputation in patients with Burger's disease.

Methods: Iloprost treatment had been given to 30 male patients with Burger's disease between January 2004-December 2007. Patients mean age was 36.8 (±5.47) years. Diagnosis was made by physical examination and peripheric angiography. Iloprost was started at the dosage of 0.5 ng/kg/min and gradually increased to 3.0 ng/kg/min. Iloprost therapy was given for 4 weeks (6 h in 5 days of a week). No intolerable side effects were seen. Pain scoring value, wound diameter measurement in patients with ulcer and ABL measurement

was evaluated before treatment and 1 and 6 months after treatment. Previous surgical intervention history was evaluated. Fifteen patients (5 in right foot, 8 in left foot and 2 in both feet) had ulcers before therapy. Minor amputation to four patients, sympathectomy to three patients and femoropopliteal bypass surgery to two patients had been performed in other clinics.

Results: Complete recovery was observed in 26 patients (85.7%) and partial recovery was observed in four patients (decrease in ulcer diameter in three patients and finger (toe) amputation in one patient) after treatment. Fourteen patients, including all of four patients with partial recovery had continued smoking during therapy. There was significant increase in mean ABL and significant decrease in pain scores of patients in the post first and sixth months of therapy.

Conclusions: Iloprost seems to be a reliable alternative in the treatment of Burger's disease by decreasing rest pain, analgesic usage, ulcer diameter and amputation rate.

V10-3

LEUKOCYTE ACTIVATION AND REDOX CHANGES FOLLOWING AORTO-BIFEMORAL BYPASS SURGERY

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Objectives: While aorto-bifemoral bypass (ABP) surgery is a routine intervention, the postoperative complications mainly depend from the operation stress, and the tolerance of the patient. During due to the cross-clamping and the aorta a mass of peripheral skeletal muscle is suffering from ischaemic-reperfusion injury (IRI). A whole of evidences point to oxidative stress, as an important trigger in the complex chain of events leading to reperfusion injury. In the present study the authors aimed to examine the oxidative stress parameters, the antioxidant-prooxidant state and the expression of leukocyte adhesion molecules (CD11a and CD18) following aorto-bifemoral bypass surgery.

Methods: Sixteen patients, underwent an ABP surgery, were examined in the prospective randomized study. Peripheral blood sample collection was before the operation (ischaemic period), and after the reperfusion in the 2nd and 24th h, and on the 7th day. For monitoring the cellular oxidative stress plasma superoxide-dismutase (SOD) activity, reduced glutathion (GSH) concentration, and total thiol (SH) group concentration were measured. The degree of lipidperoxidation was marked with the quantity of malondialdehyde (MDA). For characterize the inflammatory response the plasma myeloperoxidase (MPO) level, leukocytes free radical production, and the expressions of leukocyte adhesion molecules (CD18, CD11a) were measured.

Results: Our results showed, that the speed and rate of free radical production significantly increased in the early reperfusion ($P<0.05$). The level of the antioxidant enzymes decreased after the revascularisation. The CD11a and CD18 expression of the granulocytes significantly ($P<0.05$) decreased right after the revascularisation, but with a gradual elevation, until the 7th day they exceed the ischaemic value.

Conclusions: Our results showed the turnover of the sensitive antioxidant-prooxidant balance after ABP operation. The critical period for systemic inflammatory response is the first 24 h, but increased leukocyte activation could be detected still the end of the first week. Supported by OTKA K67731, K48851, K60227 grants.

V10-4

TREATMENT OF TYPE III ENDOLEAK BY ENDOVASCULAR TECHNIQUE THREE CASES

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Objectives: We present three patients with Infrarenal Abdominal Aortic Aneurysm (AAA), who underwent endovascular repair. Type III endoleak was detected on follow-up period.

Methods: All the patients were males and had a symptomatic aneurysm considered suitable for endoluminal therapy. Case 1: A 59-year-old patient with a 6.2 cm of diameter AAA was treated with a Lifepath (Edwards) bifurcated stent graft. A type I endoleak was detected at one month follow-up, and was successfully treated by a Zenith (Cook) proximal extension. After four years, a type III endoleak was observed on a CT-scan, because of distal migration of the previous bifurcated graft. A Talent (Medtronic) aorto-uniiliac pros-

thesis was implanted, with contralateral iliac occlusion and femoro-femoral bypass. The leak was corrected. Case 2: A Zenith (Cook) bifurcated endoprosthesis was implanted in a 80-year-old patient who had a 6 cm of diameter AAA. After five years, disconnection and distal migration of both iliac grafts was observed on a CT-scan. The type III endoleak was successfully treated with bilateral iliac extensions. Case 3: A 78-year-old patient with a 6.3 cm of diameter symptomatic AAA underwent endovascular repair with a Zenith (Cook) bifurcated graft. At 2 years follow-up, a Thoracic Aneurysm and a type III endoleak at iliac gap were detected. The thoracic aneurysm was treated with a Relay (Bolton Medical) stent-graft prosthesis and the leak was sealed with an iliac extension.

Results: The three cases with type III endoleak were repaired satisfactory with endovascular technic.

Conclusions: Type III endoleaks are less common than others, but when detected, they must be treated because the risk of aneurysm rupture is highly increased. The endovascular approach appears to be the treatment of choice with satisfactory results.

V10-5

CHANGES IN CEREBRAL PERFUSION AND TISSUE OXYGENATION AFTER OCCLUSION OF EXTERNAL CAROTID ARTERY

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Objectives: Lack of sufficient blood flow during an ischemic attack is the main cause of brain injury leading to neurological deficits and death among stroke patients. Augmenting blood flow to the ischemic tissue to maintain tissue viability can minimize neurological deficit. The objective of this study was to assess the effect of external carotid artery (ECA) occlusion on ipsilateral cerebral blood flow (CBF).

Methods: Blood flow measurements: local cerebral hyperperfusion in rats ($n=12$) was induced by the ligation of the right ECA. Cerebral blood flow (CBF) in the area of the middle cerebral artery (MCA) was determined pre and post ligation of ECA for 120 min using a laser Doppler flow meter. Sham animals ($n=6$) were subjected to the craniotomy without ligation of right ECA. Systemic mean arterial pressure (MAP) was monitored through a cannula in right femoral artery. Blood brain barrier permeability was evaluated on harvested brains using Evans blue solution prior to sacrificing the animals. Cerebral water content was determined using a wet/dry method. Tissue oxygen level measurements: in the separate series of rats ($n=5$), brain tissue oxygen level (pO_2) in the right and left brain hemispheres were determined before and 90 min after ligation of the right ECA using a tissue oxygenation monitoring unit.

Results: Ligation of ECA resulted in a significant increase in CBF in ipsilateral MCA territory compared to the sham animals ($P<0.0001$). There was no significant variation in MAP for the treated animals through out each experiment. Vascular permeability and cerebral water content in the right hemisphere after ligation of ECA did not significantly differ from contralateral hemisphere or the sham animals. Brain tissue PO_2 of the ipsilateral side, measured 90 min after ligation of the right ECA, was significantly higher compared to contralateral area ($P=0.0012$) or to the ipsilateral area ($P<0.0001$) prior to ligation.

Conclusions: Ligation of the external carotid artery can potentially be a viable option to augment perfusion in the ipsilateral side of the brain where ischemic attack occurs. The treatment did not cause pronounced cerebral edema or breakdown of the blood-brain barrier. Temporary occlusion of the ECA might have therapeutic implications in patients with ischemic stroke. However, further studies are needed to examine this therapeutic effect on other preclinical models that are closer to human cerebrovascular architecture with and without induction of stroke to better assess beneficial impact of ECA occlusion on stroke recovery.

V10-6

OUR CLINICAL EXPERIENCES RELATED TO E-POLYTETRAFLUOROETHYLENE GRAFT USED FOR PERFORMING ARTERIOVENOUS FISTULA IN THE PATIENTS WITH CHRONIC RENAL FAILURE REQUIRING HEMODIALYSIS

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Objectives: A arteriovenous fistula performing with e-PTFE (expanded polytetrafluoroethylene) vascular graft allows vascular access for hemodialysis where a primary fistula is not possible. We aimed to evaluate our clinical experience related to this prosthetic graft.

Methods: We performed arteriovenous fistula using e (expanded)-PTFE graft in the 35 patients with end-stage renal failure requiring hemodialysis between September 2003 and November 2007. The mean age of patients were 55.09 ± 12.2 (range 23-74). There were 16 women and 19 men. Beforehand in all patients were performed direct arteriovenous fistula in the upper extremity and these arteriovenous fistulas wasn't functional. All patients were performed Doppler ultrasound examination of the upper and lower extremity arteries and veins. The patients were used e-PTFE (Gore Intering vascular graft) graft 7 mm in diameter tapered to 4mm at the arterial site.

Results: Between brachial artery and axillary vein in 24 patients (68.6%), between radial artery and antecubital vein in six patients (17.1%), between femoral artery and femoral vein in five patients (14.3%) were performed arteriovenous fistula. In all patients primary patency rate were 81.9%, 66.6%, and 26.6% at 6, 12, and 24 months. Secondary patency rates at 6, 12, and 24 months were 78.2%, 33.3%, and 17.6%. There were no perioperative morbidity and mortality. Mean follow-up was 27.22 ± 12.04 months (range, 2-48 months).

Conclusions: e-PTFE grafts provide satisfactory patency rate. Preoperative doppler ultrasonography and venography examination are important for showing of probable graft configurations. Thrombosis is the most complication.

V10-7

LYMPHOSCINTIGRAPHY OF UPPER AND LOWER EXTREMITIES: APPLICATION IN THE CLINICAL PRACTICE

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Objectives: Nowadays one of the most actual problem of early diagnostics of lymphedema is visualization of lymphatic structures of an extremity. It is basis for choice of the most adequate method of treatment.

Methods: lymphoscintigraphy is miniinvasive method of evaluation of lymphatic system state of extremities in case of edemas of various genesis. The procedure allows to detect intravitaly functionally full-fledged lymphatic vessels and nodes. There are two advantages of the method: 1) the only possibility of objectification of the 0 stage of lymphedema, hypo- or aplasia of lymphatic system, 2) multiple continuous control over results of treatment, 3) prognostication of lymphedema development regarding type of lymph transport. The method of lymphoscintigraphy is informative and do not have contraindications. No case of complications was fixed. The investigation in the gammer-ray chamber in the whole body scan regime provides complete view of type and intensity of lymphatic system pathology on the whole extremity's length. According to the investigation protocol, Tc99m-NANOCIS of high specific activity is introduces to a patient subcutaneously in the first interdigital space on the dorsum pedis. The dose of radiopharmdrug 150-200 MBq. Scintigrams are made in 5-20 min after the injection of drug.

Results: The results of investigation showed that there are different types of lymphatic drainage: main (collector), nodal and retrograde, and their different combinations. Collector and nodal types of lymph flow are the most favourable. The type of lymph flow allows to make a conclusion about the possibility of making lympho-venous anastomosis. Diffuse type of lymph flow is prognostically unfavourable in relation to lymphedema development and give evidence about low compensatory opportunities of lymphatic channel. As it was detected, diffuse lymph flow in extremities does not provide drainage of lymph to the level of regional lymph nodes.

Conclusions: Retrograde lymph flow is evident sign of an obstacle to lymph movements. The sensitivity of the method according to our data is 81-87% at patients with different damages of lymphatic or venous disease, and 52% at patients with other diseases (trauma, malignant neoplasms and so on). Almost every fifth patient with diseases of venous system has not damages of lymph outflow according to scintigraphy data.

V10-8

PATHOGENETICAL APPROACHES DIAGNOSTIC AND TREATMENT OF LYMPHEDEMA OF LOWER EXTREMITIES

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Objectives: There are structural changes of lymphatic stream, functional state, and the immune state of patients organism, microcirculatory stream have very important meaning in pathogenesis of lymphedema of lower extremities. Damage of microcirculatory stream, damage of function of lymphangion and its consequential structural changes lead to progression of extremities edemas. For specification of a form and stage of the disease it is necessary to perform a complex of diagnostic procedures (MRI, lymphoscintigraphy, laser doppler flowmetry, volumetry, lymphography, biopsy of lymphatic vessel with checking its motor activity). The evaluation of morphological and functional integrity of lymphangion, investigation of microcirculatory stream are the basis for choice of adequate pathogenetically grounded individualized approach to treatment.

Methods: Experience of diagnostics and treatment of 3200 of patients with primary and secondary lymphedema of lower extremities is presented in this paper.

Results: The index of pulse harmonic/myogenic harmonic allows to diagnose the increase of tissues edema and fibrosis on the LDF-gramm and pathological changes at different stages of lymphedema. Complex conservative treatment has foreground importance, including pharmacological, physiotherapeutical and compressive methods of treatment. The introduction of lymphotropic and endolymphatic therapy gave the biggest success. Surgical methods of treatment are used in case of secondary lymphedema with preserved contractive activity of lymphangions with application of different types of anastomoses between elements of lymphatic stream and venous system.

Conclusions: The method of LDF adequately represents the changes of human tissues hydration and may serve as a method of diagnostics of pathological changes at different stages of lymphedema. On the basis of pathophysiological and morphological investigations diagnostics schemes of patient's examination have been revised and new methods of treatment have been introduced, which allow to improve patients quality of life.

V10-9

THE FIVE YEAR EXPERIENCE OF COMPLEX TREATMENT OF PATIENTS SUFFERING FROM DYSPLASIA OF SUPERFICIAL VEIN UPPER AND LOWER EXTREMITIES

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Objectives: The aims of this study were improving the results of treating the patients with this pathology.

Methods: From 2002 to 2007, 42 patients (12 males and 30 females, average age 25-year-old) were treated in our hospital. In 27 cases pathology was located only on one lower extremity, in 3 cases venous malformation was on both lower extremities, in 12 cases dysplastic veins located on one upper extremity. All these patients were provided with the procedure of spiral computed ascending phlebography with contrast examination of the vein, Duplex ultrasound, analysis of the blood of hemostasis. After these examination 10 patients were operated and than sclerotherapy was performed, 32 patients were performed only sclerotherapy. After treatment all these patients used compressive stocking wear (II-III compression class), took phlebotonic 2-3 times a year, every course lasting 2-3 months.

Results: Thirty-five patients showed good results of treatment, 7 patients satisfactory results. No cases of unsatisfactory results appeared. The criteria of assessment were: subjective improvement for the better life, decrease of symptom of chronic venous insufficiency, stabilization of pathology process, decrease of cosmetic fault. Decreasing of degree of chronic venous insufficiency from 3-4 to 1-2 was in 80% and from 2 to 1 degree in 20%. The relapse of venous trophic ulcers and bleeding from varicose vein for period examination didn't appear. Three patients were performed surgical treatment due to pain syndrome and phleboliths in the zone of sclerotherapy.

Conclusions: The surgical treatment has been shown as the first step of treatment for removal horizontal and vertical reflux of superficial venous system in lower extremities. Choosing the method of sclerotherapy requires additional examination in system of hemostasis and individual approach to everybody. The treatment of patients suffering from dysplastic superficial veins requires stage by stage, complex approach, permanent examination in dynamics.

V10-10

THE TREATMENT OF CONGENITAL LYMPHEDEMA IN CHILDREN

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Objectives: The purpose of the investigation was to improve the results of treatment of lymphedema at children.

Methods: The treatment group consisted of 38 patients with congenital lymphedema. We examined children with congenital lymphedema of upper and lower extremities 15 patients having both extremities involved, 9 only left extremities, 13- right extremities and one child upper extremity. The treatment of 7 children was started before their first year of age, 8- before their third year of life, other 23 children - after they were 12-year-old. On their first visit to a doctor 31 patients had complaints of edema of unknown origin. Edema was located on foot and lower third of shin. On the admissions to the hospital seven patients had erysipelas. Lymphoscintigraphy: Tc-99 spread in lymph nodes slowly, clear visualization of lymph nodes, which accumulated Tc-99, occurred in 5-6 h. All patients followed the course of basic therapy aimed at improving of lympho-drainage function. Children with erysipelas were given the conservative treatment after controlling over inflammation.

Results: The results were considered to be good if edema was reliably decreasing and there were no complaints of feeling of heaviness and fatigability of legs (23 patients). If edemas decreased incompletely, and some complaints remained, then the results were considered to be satisfactory (13 patients). And if there was no positive dynamics, the results were believed to be unsatisfactory (2 children). After the course of the basic therapy the patients followed the supporting therapy once semiannually.

Conclusions: Children who developed the disease after 12 years of age responded the treatment much better than those who developed it under three years of age.

V10-11

THE FACTORS AFFECTING PROGNOSIS OF ACUTE LOWER LIMB ISCHEMIA

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Objectives: Acute thromboembolic ischemia of lower limb is a common vascular disease and has high morbidity and mortality. The success of treatment either surgical or medical, depends on several factors. We aimed the factors that define the prognosis of lower limb embolic events and compared the results of surgical and medical treatment.

Methods: During 2002-2007, 217 patients admitted because of the acute lower limb thromboembolic arterial occlusion. These patients were evaluated retrospectively. Demographic data, approach of treatment and hospital mortality and morbidity were recorded.

Results: Majority of the patients were male (67%). Diabetes, history of smoking, previous cardiac event were found in most of the patients. Of the 217 patients, 131 were treated with surgical embolectomy. Twenty-eight patients were attended to the hospital in 0-6 h (21.3%), 22 patients in 6-12 h (16.7%), 27 patients in 12-24 h (20.6%), 25 patients in 24-48 h (19.1%) 29 patients 48 h (22.3%) after the occurrence of symptoms. Seventy-six patients had lack of motor function of distal lower limb in several degrees. Hospital mortality was 27. The death rate is higher in women group and in medically treated group. The delay in admittance to hospital after the onset of symptoms was found as the most significant risk factor for prognosis.

Conclusions: The main treatment in the acute limb ischemia is surgical embolectomy. Diabetes, older age, delay in admittance to emergency room are the most significant risk factors that affect mortality and morbidity.

V10-12

PERCUTANEOUS ARTERIAL CLOSURE AFTER CORONARY ANGIOGRAPHY WITH ANGIO-SEAL: VASCULAR COMPLICATIONS

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Objectives: Femoral artery closure with Angio-Seal is an extended procedure but not innocuous. We describe our most recent experience.

Methods: Between 2005 and 2007, 2000 coronary artery angiographies has been done and Angio-Seal has been used in all of them. Fourteen patients developed ischemic complications early or late after femoral artery closure. A patients developed an infected pseudoaneurysm of the common femoral artery, five presented a pseudoaneurysm of the common femoral artery, three a femoral haematoma, three suffered an acute limb ischemia, and two patients had a subacute limb ischemia.

Results: All the patients required a vascular surgical intervention. Direct repair was done in seven patients and arterial reconstruction in seven by means of Goretex bypass (*n*: 4) or saphenous vein bypass (*n*: 3). In all the patients the operation resolved the Angio-Seal complications without consequences.

Conclusions: The incidence of complications associated to the percutaneous closure of the femoral artery with Angio-Seal is low but always required surgical intervention that can be done with satisfactory results.

V10-13

FASCIOTOMY FOR CRUSH INJURY; THE RESULTS OF TWO YEARS FOLLOW-UP IN BAM EARTHQUAKE

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Objectives: At 5:30 AM of 25th December 2003 a strong earthquake was occurred in Bam that had about 80 thousands casualties. St. Zahra hospital as a referral center was admitted 255 patients and fasciotomy were done in twenty patients because of severe soft tissue crush injury of upper and lower extremities. We evaluated the complications and outcome of fasciotomy in these patients.

Methods: In 20 cases with crush syndrome, twenty-six fasciotomy of extremities were done. In 24 months of follow-up, sensation and motor function of limbs and joints' range of motion were evaluated.

Results: After two years, all of patient could walk appropriately by themselves and joints' range of motion were within normal ranges. In seven patients (11 extremities) hypoesthesia or hyperesthesia relieved utterly and remained cases had satisfactory or normal sensation in extremities. Only in one patient, sensation was limited in safenous dermatome because of radical debridement. The rest patients had suitable sensation in palmar region. **Conclusions:** Fasciotomy is not only a safe procedure in patients with crush syndrome but also is necessary for limb preservation. Fasciotomy also can preserve normal function of limbs. Indubitably, physical medicine and rehabilitation and using of prosthesis are necessary to obtain best performance. In a nutshell, fasciotomy should be done for limb salvage; even it could not preserve limb function utterly.

V10-14

FEMORAL PSEUDOANEURYSMS POST CARDIAC CATHETERIZATION SURGICALLY TREATED: EVOLUTION AND PROGNOSIS

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Objectives: To analyze the postoperative evolution of patients submitted to surgical repair of femoral pseudoaneurysm after cardiac catheterization.

Methods: Prospective study. Cardiovascular risk factors, related to surgery and cardiac catheterization were collected prospectively in 79 patients from 2003 to 2006 in an University Hospital. The indications of surgery included devitalization of adjacent soft tissue and skin, rapid growth, infection, bleeding, hemodynamic instability or failure of the percutaneous treatment. Patient and management related predictors for 30-days outcome were analysed.

Results: Fifty-six patients (56/79, 71%) underwent some type of postoperative complication, the most frequent being the need for a transfusion. Infection (15/79, 19%) and dehiscence of the surgical wound (10/79, 12.7%) were the other two most common complications. The mortality related to the intervention was 3.8% (3/79). The mean hospital stay was 32.5 days (± 28.4 days). Significant risk factors in logistic regression model were woman ($P=0.023$, $OR=9.66$), more than 70-year-old ($P=0.049$, $OR=0.15$) and the concurrent use of anticoagulation or antiplatelet therapy after the cardiac catheterization ($P=0.005$, $OR=0.03$). The surgical interventions were more often during the summer months, particularly May and August.

Conclusions: Patients treated surgically of femoral pseudoaneurysm post cardiac catheterization present a high postoperative morbidity and hospital stay. Factors such as female gender, age over 70-years-old and treatment

with anticoagulants or antiplatelets increase the postoperative morbidity. A seasonal influence was appreciated, with a higher frequency during the summer period.

V10-15

PHYSIOPATHOLOGICS CHARACTERISTICS OF THE ARTERY PROFUNDA FEMORIS WITH OCCLUSION OF THE SUPERFICIAL FEMORAL ARTERY

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Objectives: The profunda femoral or deep femoral artery, physiologically supplies the tissue of the thigh. The profunda femoris artery is recognized the most important collateral vessel for natural bypassing when is obstructed superficial femoral artery and is essential for maintaining limb viability. It is very interesting evaluate the hypothetic growing of the profunda femoris artery in situations of occlusion of superficial femoral artery.

Methods: In 45 patients, we examined 60 femoral angiograms. The angiograms were measured with VIDS III program image (computerized planimetry) to quantify the different parameters. Group I (*n*: 20 PFA angiograms) consisted of 10 patients with normal profunda and superficial arteries. Group II (*n*: 20 PFA angiograms) consisted of 20 patients with angiographically proven SFA occlusion and normal PFA. Group III (*n*: 20 angiograms) consisted with superficial arteries occluded and stenosis of the first segment of the deep femoral arteries. The parameters evaluated are area, length, maximum diameter, angle, ferrets diameter and form factor of the deep femoral arteries.

Results: There are changes of the different parameters studied with differences between the groups studied but without statistically significances differences. In the comparative analyses, the presence of superficial femoral artery occlusion did not show any relation with the planimetry of deep femoral artery.

Conclusions: In conclusion the profunda femoris artery is in theory, the greatest source of collateral vessels to the distal femoropopliteal segment. The incidence of growing of deep femoral artery in compensation of occlusion is low and the different are not statistically significant.

V10-16

THE INFLUENCE OF VIDEOASSISTED THORACIC SYMPATHECTOMY ON FLOW MEDIATED DILATATION OF BRACHIAL ARTERY AND PERIPHERAL SKIN MICROCIRCULATION

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Objectives: The aim of the study was to investigate the influence of videoassisted thoracic sympathectomy (VATS) on hemodynamical properties of brachial artery and peripheral skin microcirculation of upper extremity.

Methods: Twelve patients (female 7, male 5) with hyperhidrosis of palms were included in the study. Mean age of the patients was 26.8 years. Resting diameter of brachial artery and its so called flow mediated dilatation (FMD) were measured by colour Doppler ultrasound after a 5-min period of upper arm ischemia. Skin blood flow and skin temperature on the dorsal surface of the hand and the tip of the IIIrd finger were measured with double channel laser Doppler flowmetry. Two sets of measurements were performed: 24 h before VATS and 24 h after VATS.

Results: VATS lead to increase of the resting diameter of brachial artery when compared with its diameter before the procedure (increase of $8.1\% \pm 3.2\%$). Moreover, sympathectomy significantly diminished FMD of brachial artery (from $7.2 \pm 2.1\%$ to $3.1 \pm 1.8\%$). Thoracic sympatectomy evoked significant increase of resting skin blood flow both on the dorsum of the hand as in the fingertip (increase of $42 \pm 16.3\%$ and $121.7 \pm 43.0\%$, respectively). Similarly with the skin temperature (increase of $8 \pm 0.8\%$ and $11 \pm 2.1\%$, respectively). The differences were statistically significant according to paired *t*-Student test ($P < 0.05$).

Conclusions: Increase of skin blood flow and skin temperature objectively confirms vasodilatation after videoassisted thoracic sympathectomy. Significant reduction of flow mediated dilatation of brachial artery, indicating its maximal dilatation after sympathectomy, also proves the anticipated effect of the procedure. Laser Doppler Flowmetry contrary to colour Doppler ultrasound may not be available in every vascular department. We think that measurements of flow mediated dilatation of brachial artery may also be a valuable tool for objective evaluation of the results of thoracic sympathectomy.

V10-17

CASE REPORT: ACUTE MESENTERIAL ISCHAEMIA IN A YOUNG FEMALE

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Objectives: Acute mesenterial ischaemia in young adults is a very rare and unusual pathology. A possible cause could be the antiphospholipid syndrome (APS) - a thrombophilic disorder in which venous and arterial thrombosis can occur. We present a case of acute mesenterial artery thrombosis in a young female patient.

Methods: A 24-year-old female was admitted in the surgical department with complaints of severe abdominal pain and vomiting during one day. Approximately seven months earlier she was operated with a suspicion of appendicitis; before that she had had quite similar symptoms, only the pain was less intensive. During the operation partial necrosis of the small intestine was found and a resection of the necrotic intestine was performed. After surgical interventions there occurred a small thrombotic lesion in the wall of the abdominal aorta, straight at the beginning of the superior mesenteric artery (SMA) detected with CT angiography (CTA). As the lesion did not cause significant stenosis, anticoagulant treatment with warfarin was started. During six months treatment the lesion did not change but then, for an unknown reason, warfarin treatment was terminated. During the following four weeks the patient had weak abdominal pain which became worse; finally the patient was readmitted after severe abdominal pain and vomiting during one day. CTA showed a floating thrombus in the abdominal aorta and in the proximal part of the SMA. The thrombotic lesion was markedly larger compared with earlier findings, causing haemodynamically significant stenosis of the SMA. The patient was immediately operated, thrombectomy of the abdominal aorta and SMA with a patch closure was performed. After 48 h, during a second-look operation, a resection with length of about 70-80 cm of the small intestine was done. Anticoagulant treatment was continued after surgery.

Results: The patient recovered from surgery without major complications. As anticardiolipine antibodies were detected later in the patient's blood, primary APS was suspected and permanent anticoagulant treatment with warfarin was prescribed. Two months after surgery a follow-up CTA was done and no thrombotic lesions were detected in the abdominal aorta or the visceral arteries.

Conclusions: This case illustrates a rare life-threatening complication of thrombophilic disorder and the importance of anticoagulation treatment following thrombotic complication.

V10-18

VISCERAL ANEURYSMS: REPORT AND REVIEW OF THE LITERATURE - CASE REPORT

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Objectives: The visceral aneurysms are rare and prone to rupture. The rare renal aneurysm may result indeed in renal parenchyma loss. The endovascular treatment is safer and has become the gold standard in the management of this problem. The objective of this work is to report a case of visceral aneurysms.

Results: A 56-year-old woman who was submitted to a computed tomography scan, because of her history of abdominal aortic aneurysm in the family. She presented a bilateral renal and one spleen aneurysm. She underwent to a successful arterial embolization with detachable steel coils of the right renal aneurysm, without any related complication. The others aneurysms were kept in an expectancy policy.

Conclusions: The inusitate of this case was the fact that three aneurysms were found in a healthy asymptomatic patient. The embolization with coils of visceral aneurysms can be done with safe, despite the fear with some problems as parenchyma loss.

V10-19

ENDOVASCULAR TREATMENT OF PSEUDOANEURYSM CAUSED BY PENETRATING INJURY OF THE ABDOMEN

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Objectives: Open surgical treatment of posttraumatic pseudoaneurysm of abdominal aorta located above celiac trunk is difficult and may lead to vis-

ceral arteries injury. Endovascular technique seems to be good alternative method of treatment, with lower risk of complication. We present a case of posttraumatic pseudoaneurysm of abdominal aorta treated by stentgraft implantation.

Methods: In 2006, 22-year-old male was referred to our Department due to pseudoaneurysm of abdominal aorta caused by penetrating injury of the abdomen. Before admission, patient was treated in another hospital due to haemorrhage caused by a stab wound of the abdomen. Surgical management consisted of laparotomy which revealed stomach wall perforation with severe bleeding. The puncture was sutured. There was no sign of bleeding after operation. Postoperative computed tomography showed a presence of large pseudoaneurysm (diameter 56x77 mm) located 20 mm above celiac trunk. At admission patient was stable, with no signs of hemorrhagic shock. After careful evaluation, we decided to exclude pseudoaneurysm with endovascular technique (straight tube stentgraft, Zenith Cook).

Results: Controlled computed tomography revealed complete exclusion of pseudoaneurysm, celiac trunk patency and no signs of infection. Postoperative period was uneventful. During follow-up period there was no sign of endoleak.

Conclusions: This case demonstrates feasibility and effectiveness of endovascular technique as a treatment of posttraumatic pseudoaneurysm of abdominal aorta located above celiac trunk.

V10-20

EMERGENCY ENDOVASCULAR TREATMENT FOR TYPE B DISSECTION COMPLICATED BY FALSE CHANNEL RUPTURE IN THE ABDOMINAL AORTA

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Objectives: The aim of the study was to describe the successful endovascular treatment of two cases of ruptured aortic dissections in the abdominal aorta.

Methods: Recently two patients (patient 1: a 72-year-old female; patient 2: a 78-year-old male) were treated for a ruptured aortic dissection in the infrarenal portion of aorta in an acute setting. Patient 1 was admitted with a ruptured acute abdominal dissection superimposed on an abdominal aortic aneurysm. Thoracic endografting followed by unilateral abdominal stentgraft placement with suprarenal fixation and ligation of the contralateral external iliac artery were performed. Perfusion to the left lower limb was restored by a femoro-femoral bypass. Patient 2, who 2.5 years earlier had a thoracic stentgraft implanted for a type B aortic dissection, was readmitted to our hospital with a ruptured false channel of the abdominal aorta. He underwent an endovascular procedure which consisted of: implantation of a covered stent across the detached ostium of the right renal artery and closure of the distal re-entry with a stent-graft limb implanted in the right iliac artery.

Results: Hemorrhage was contained and progressive healing of the aorta was observed in both cases. In case 1, an uneventful type II endoleak to the true channel of the AAA through the inferior mesenteric artery was observed. In case 2, limited inflow to the false channel was observed at the level of right renal artery. Patients were discharged from the hospital and presented no symptoms related to the aortic pathology at six month follow-up.

Conclusions: Our limited experience shows that in selected cases endovascular treatment for ruptured abdominal aortic dissections is feasible and effective. Each patient requires an individual approach according to the unique anatomical conditions in the presented aortic pathology.

V10-21

Y-SHAPED PATCHPLASTY AND AVOIDANCE OF SURGICAL TRAUMA TO ATYPICALLY PLACED NERVUS HYPOGLOSSUS DURING CAROTID ARTERY ENDARTERECTOMY: A CASE REPORT

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Objectives: We present a patient in whom a Y-shaped patch plasty was performed to both internal and external carotid arteries, and surgical trauma to atypically placed nervus hypoglossus was avoided during carotid artery endarterectomy.

Methods: During the operation, when exposure of common, external and internal carotid arteries were done, nervus hypoglossus was found to be

placed more inferior than its expected anatomic localization, crossing the carotid bulb. Nervus hypoglossus was mobilized and preserved with a vessel loop. An arteriotomy was done to common carotid artery and when continued distally, a heavy atherosclerotic plaque extending to both internal and external carotid arteries was seen. The arteriotomy in the common carotid artery was extended to both internal and external carotid arteries. A polytetrafluoroethylene patch in a Y-shape was prepared. Proximal end of the patch was sutured to common carotid artery and the suture line continued to distal ends of the patch, which were sutured to internal and external carotid arteries, respectively. During the procedure, surgical trauma to atypically placed nervus hypoglossus was avoided.

Results: There were no any neurological complication in the postoperative period. The patient remains in good health in his postoperative eighth month.

Conclusions: Surgical trauma to nervus hypoglossus during carotid endarterectomy operations has been reported to be rare (ranging between 1.1-2.7%) due to its relatively distant localization to carotid arteriotomy area. Although it is rarely seen, atypically placed nervus hypoglossus should be kept in mind during carotid artery endarterectomy. Atherosclerotic plaque may extend into both internal and external carotid arteries and endarterectomy to both carotid arteries may be needed. In this situation, we think closure of the arteriotomy with a Y-shaped patch is safe and feasible.

V10-22

SURGERY OF NON-ATHEROSCLEROTIC DISEASES OF THE INTERNAL CAROTID ARTERY

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Objectives: Despite many advances in vascular surgery during the last decade and the emergent role of endovascular techniques in supra-aortic trunks, surgery of the internal carotid artery remains the unique alternative to treat certain patients such as those with non-atherosclerotic diseases. In an era of ever-expanding therapeutic modalities available to the vascular surgeon, it is important to remark that open surgery of the arteries to the head is still a very good option and, in many patients, is the treatment of choice or even the unique therapeutic option.

Methods: Here we report several cases of open surgery of non-atherosclerotic disease of the internal carotid artery in patients unfit for endovascular treatment.

Results: Open surgery of non-atherosclerotic diseases of the internal carotid artery is still the treatment of choice for most of the cases since endovascular techniques are not an option for this group of patients.

Conclusions: In the era of endovascular surgery, we think that it is important not to forget the role of open surgery and to review the experience of residents and young surgeons on the vascular surgery services regarding this type of techniques.

V10-23

OUR OPERATIVE PROCEDURES IN OUR INFRA-RENAL ABDOMINAL AORTIC ANEURYSM CASES

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Objectives: Continuous advances in the surgical, anesthetic, and intensive care techniques, the outcome of elective open AAA repair has improved constantly. Decline in rates of morbidity and mortality is associated with early diagnosis, treatment of coexisting diseases, advancements in surgical techniques and experience in follow-up in the postoperative intensive care unite.

Methods: Sixty-six patients who had infra-renal AAA were operated in our clinic between the dates March, 2001 and November, 2007. Forty-five patient underwent elective operation. Urgent procedures were necessary for 21 patients because of ruptured aneurysms.

Results: We performed aortobiliac bypass graft to 33 (50%) patients, aorto-bifemoral bypass graft to 18 (27.2%) patients, aorto-aortic bypass graft to 10 (15.2%) patients, aortoiliac/femoral bypass graft to 5 (7.5%) patients. There was not any death in follow-up period. The overall survival rate was 87.9%. This rate was 95.6% in the patients who had operated due to non-ruptured AAA, 72% in the patients who had operated due to ruptured AAA.

Conclusions: AAA repair can be performed at low rates of morbidity and mortality.

V10-24

THORACIC ENDOVASCULAR SURGERY FOR THE TREATMENT OF TRAUMATIC AORTIC RUPTURE

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Objectives: Traumatic aortic rupture (TAR) leads to immediate death in 75 to 90% of cases requiring mandatory surgical treatment. Despite improvements on perioperative care and surgical techniques, conventional surgery for TAR still carries substantial risk of serious complications and mortality. Thoracic endovascular aortic repair (TEVAR) has emerged as a valid alternative to open surgical treatment.

Methods: From March 2001 to June 2006, 70 patients underwent TEVAR: 7 patients (10.0%) had a TAR after road accident. The age ranged from 19 to 82 years. To evaluate the risk we follow: 1) the Glasgow Coma Score (GCS) in patients with head trauma; 2) the Injury Severity Score (ISS) in patients with multiple injuries; 3) the American Society of Anesthesiologist classification (ASA class) to describe the perioperative physical status. Five patients (71.4%) showed an unstable clinical picture (ISS 40; ASA class 3); head injury (with stupor or coma) was present in three patients (GCS 12); multitrauma with leg, arm and/or vertebral fractures occurred in 4 (57.1%) and abdominal blunt trauma in 4 (57.1%), complicated by haemorrhagic shock, previously treated by splenectomy, in one (14.3%). The first patient, affected by a pseudoaneurysm complicated by dysphonia, had a delayed TEVAR after one month from the trauma; the remaining six patients required an emergency TEVAR. The stent-graft was delivered in the catheterization laboratory under general anaesthesia with controlled hypotension. Implant strategy was selected on the basis of aortic morphology and vascular access. Two different stent-grafts were implanted: 8 Talent in 6 patients and 2 Gore in 1. Criteria for successful deployment included absence of death or surgical conversion, and exclusion of transected tract.

Results: There were no operative death and surgical conversion. Any neurological complication, including paraplegia, was observed. Right common iliac artery laceration due to the stent-graft discrepancy, occurred, treated by rescue prosthetic ileofemoral bypass. Two patients required prolonged mechanical ventilation and temporary haemodialysis. The intraoperative angiography and discharge CT-scan showed absence of endoleaks. At follow-up (12-63 months), a patient showed a late type I endoleak, treated by secondary TEVAR.

Conclusions: TEVAR is a safe procedure in TAR patients, mostly in instable/emergent conditions. Moreover, TEVAR allows for prompt treatment of associated lesions in complex multitrauma patients. TEVAR could be considered as an hypothetical bridge to open surgery in case of late failure of the stent-graft. Finally, trauma centers should have thoracic endovascular grafts available for optimal patient care.

V10-25

PREVENTION OF THE ENDOLEAKS AFTER EVAR WITH THE INDUCTION OF THE THROMBOSIS OF THE ANEURYSM SAC WITH RADIOFREQUENCY

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Objectives: This was an experimental study of endovascular aortic surgery for endovascular evaluation of the effect of thrombosis produced for coagulation of the blood of the aneurysm sac with radiofrequency method. Purpose: To determine the efficacy of the induction to thrombosis of the aneurysm sac as prevention of endoleaks after endovascular treatment.

Methods: Six dogs with induction for radiofrequency clotting blood sac of performed aneurysm and treated with stent-graft was used in the experiments in comparison with historical group of four dogs only with abdominal aneurysm treated with stent-graft. Radio frequency was applied to each nodule for 1 min at 127 mA±33 (mean±S.D.) (tip temperature, 92 °C±2). Color Duplex ultrasonography and histology study are used for the evaluation of the method.

Results: The results show the efficacy of the radiofrequency system and it is possible the discussion of the standard clinical application.

Conclusions: Endovascular repair of abdominal aortic aneurysms is dependent on the successful exclusion of the aneurysm from arterial circulation. Type II endoleaks originate from retrograde flow into the aneurysm sac. This study demonstrates the use of radiofrequency induce thrombosis in a canine model of a type II endoleak. A Ultrasound Duplex enabled the immediate and a month detection of coagulation blood after radio-frequency treatment

in dog aneurysm sac. This approach may be a strategy for future prevention of endoleaks.

V10-26

ILOPROST ATTENUATES SKELETAL MUSCLE INJURY INDUCED BY ABDOMINAL AORTIC OCCLUSION-REPERFUSION IN RATS

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Objectives: We aimed to examine the effect of iloprost on aortic-ischemia-reperfusion (AIR) induced skeletal muscle injury in rats.

Methods: Twenty-four Wistar-Albino rats were randomized into three groups (eight per group). Control group underwent laparotomy and dissection of the infrarenal abdominal aorta (IAA) without occlusion. AIR group underwent laparotomy and clamping of the IAA for 120 min followed by 120 min of reperfusion. AIR+iloprost group received 0.45 µg/kg/h iloprost by constant intravenous infusion via tail vein during 120 min of reperfusion. Blood and gastrocnemius muscle tissue samples were obtained for biochemical and histopathological analysis from all rats, respectively.

Results: Biochemical analysis showed that, in the AIR group, plasma levels of malondialdehyde, creatine phosphokinase, P-selectin, vascular cell adhesion molecule-1 (VCAM-1) and intercellular adhesion molecule-1 (ICAM-1) were significantly higher than in the control group ($P<0.05$). In the AIR+iloprost group, plasma levels of malondialdehyde, creatine phosphokinase, P-selectin and ICAM-1 were significantly lower than in the AIR group ($P<0.05$). Histopathological examination showed that, in the AIR group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor- α , CD11b, CD18, ICAM-1 and cyclooxygenase-2 were significantly higher than in the control group ($P<0.05$). In the AIR+iloprost group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor- α , CD18 and cyclooxygenase-2 were significantly lower than in the AIR group ($P<0.05$).

Conclusions: The results indicate that, iloprost attenuates AIR induced skeletal muscle injury in rats. This beneficial effect of iloprost is due to down-regulation of expression of adhesion molecules, inhibition of leukocyte infiltration into skeletal muscle tissue and reduction of lipid peroxidation.

V10-27

STUDY OF THE EFFECTS ON THE ARTERIES OF HORMONAL TREATMENT

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Objectives: The menopause is a very special stage in the woman where changes happen from the metabolic and hormonal point of view that entail deep alterations in some cases of positive character for the woman and in others being developed deep organic and functional alterations. The relations between menopause and possible alterations at level of the cardiovascular system have been reviewed by great number of authors, being the relations of but varied and go from the relation of menopause and disease cardiac, to the possible connection of estrogens with the atherosclerotic disease or to the generic cardiovascular risk without needing, referenced by other authors. The authors have an experimental study in the rat for evidenced the changes what the treatment with females hormones ovaries transplant have in the wall of the aorta artery.

Methods: The study is make with histological and morphometric techniques. The first group constituted 15 rats to which a simple ooforectomy of the attached one was practiced them straight, being to the three months sacrificed and obtained the samples due to the operation of the attached rest we will call group to him normo functioning control (Group I). The second group constituted rats to which in a first surgical time a total castration was practiced them. To the three months one sacrifices the animals and one obtains the samples. It is the castrated group (Group II), also constituted by 15 units.

Results: In the arterial pathologic study are not showy differences between the groups. A good disposition of the festooned one of elastic fibers exists. It is not appraised increase of the collagen weave nor processes related to the atheromatosis. Inflammatory phenomena nor changes in the cellular composition are not appraised either.

Conclusions: Could be concluded affirming, that in our work, we did not find significant differences in the morphometry of the blood vessels between

the groups, because possibly it is necessary more time so that changes or to that take place are necessary helping factors in addition to the loss of the ovarian function. We found significant differences in the thickness of the average layer, which indicates that the hormonal factor influences the muscular fiber of the artery.

V10-28

VASCULAR IMAGING IN BILATERAL SPONTANEOUS CAROTID ARTERY DISSECTION COMBINED WITH TYPE I AORTIC DISSECTION

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Objectives: Carotid artery dissection is one of the cause of ischemic stroke in patients without cerebrovascular risk factors.

Methods: The clinical and imagiological (MR angiography) findings in a 57-year-old man with bilateral spontaneous extracranial carotid artery dissection combined with Type I aortic dissection is described.

Results: The patient expressed that he had been operated on for Type II aortic dissection one year ago in a provincial hospital. Twelve days prior to admission he had had a dizziness and head ache attack and had been transferred to our clinic. His physical examination was normal. The MR angiography was diagnostic: A synthetic graft was seen at the proximal part of the ascending aorta. A false lumen of Type I dissection was lying down from the distal part of the ascending aorta to the iliac and femoral arteries. The dissection of the arcus aorta was reaching ahead to the bifurcation of the common carotid arteries in both sides. Medical treatment (anticoagulant and antiagregan) was given and the patient was discharged without any symptom and follow-up control was advised in three months interval.

Conclusions: In the dissection of the aorta and epiaortic vessels clinical assesment is fundamental for the diagnosis. and treatment. In suspicious clinical cases CT and MR imaging techniques are reliable, rapid and noninvasive diagnostic methods. If there is not an obligatory cause, especially in asymptomatic patients, conservative (medical) therapy should be preferred.

V10-29

SUCCESSFUL SURGICAL TREATMENT OF A RARE COMPLICATION OF THE CAROTID ARTERY ANEURYSM

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Objectives: Patient 50-year-old, was admitted to vascular department of surgical clinic with complains on presence of a tumor at the left anterior-lateral surface of the neck. This tumor appeared about a year ago. About three month ago two fistulas developed in this region. From time to time serous-haemorrhagic fluid discharged from these fistulas. Physical examinations revealed pulsating tumor 6×3×3 cm in size with systolic murmur.

Methods: Duplex ultrasonography visualized an aneurism of the common carotid artery with intraluminal thrombosis and two fistula channels between the aneurism and the skin surface on the neck. The both of these fistulas were thrombosed. This diagnosis was confirmed by spiral computer tomography.

Results: Resection of the aneurism with part of the sternocleidomastoid muscle and the skin, surrounding the fistulas, was performed. Restoration of the blood flow from the common carotid artery into the internal carotid artery was done using double autovenous by-pass, prepared from two segments of the vena saphena magna. Revision of the resected complex of tissues confirmed the preoperative diagnosis in details. The patient was discharged from the clinic in 15 days after surgery without any complications.

Conclusions: Duplex ultrasonography could provide very reliable diagnostic information for successful surgical treatment of such rare complication of the carotid artery aneurism.

V10-30

ANEURYSM IN A PERSISTANT SCIATIC ARTERY

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Objectives: The incidence of a persistent sciatic artery has been estimated as low as 0.025%-0.04%. This artery is prone to atherosclerotic change and is associated with aneurysmal change in 46.1% of the cases; these cause a

painful or painless pulsatile mass, distal embolization, sciatic neuropathy, or rupture. We present a case with aneurysm in persistent sciatic artery.

Methods: A 59-year-old male admitted us with a pulsatile mass on right gluteal region one month after a trauma. As we confirmed that all parameters are normal with the routine medical follow-up, we performed an aorto-peripheral angiography. The distal abdominal aorta and common iliac arteries were anatomically normal. We realised that the right iliac artery was hypoplastic with 50% stenosis. In the right lower extremity the common femoral artery and superficial-profundal femoral arteries were hypoplastic. Internal iliac artery was wider than its normal size with a 6 cm aneurismatic dilatation about 3-5 cm distal to the bifurcation. The artery was anatomically passing through the gluteal region and in the posterior femoral region continuing as popliteal artery just before the trifurcation. This anatomic variation showed us the persistent sciatic artery.

Results: We performed the surgery after the routine perioperative medical follow-up under general anesthesia. We used the classic right paramedian oblique abdominal incision and another incision between right m. Biceps femoris and m.vastus lateralis. We performed a bypass surgery between right common iliac artery and right sciatic artery before we ligated the internal iliac artery distally to the proximal anastomosis and sciatic artery proximally to the distal anastomosis. The patient was transferred to the postoperative intensive care unit after the surgery and to the vascular surgery clinic on postoperative 1st day. He the was discharged on the postoperative day 7 without any problem.

Conclusions: Persistent sciatic artery is prone to early atherosclerotic degeneration and aneurysm formation in up to 44% of cases. Even if the exact cause of aneurysm formation is unclear, predisposing factors are a congenital hypoplastic vessel wall with reduced elastic elements and exposure of the artery to frequent and repeated trauma in the gluteal region. Aneurysms can be treated by ligation, by excision or by endovascular approach. The revascularization of the lower limb is crucial as in persistent sciatic artery cases as femoral arterial system may be hypoplastic.

April 26th, 2008 3rd Congress Day

16:30-18:00

11th Vascular Scientific Session - Miscellaneous

V11-1

'VISCERAL HYBRID' REPAIRS OF THORACO-ABDOMINAL AORTIC ANEURYSMS: CURRENT EVIDENCE FOR PRACTICE

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Objectives: Thoraco-abdominal aortic aneurysm repair (TAAAR) remains a formidable challenge to vascular surgical practice. A wholly endovascular approach to TAAAR represents a new treatment paradigm. However, fenestrated and branched endovascular technologies are still in their infancy. For patients with unsuitable aneurysm anatomy, the 'visceral hybrid' represents an alternative to an open repair. We present a data synthesis of a systematic literature review of these repairs.

Methods: A systematic search of five electronic databases (PubMed, Ovid, Cochrane, Embase, Google Scholar) was performed. No language or date restrictions were made. All articles describing TAAAR involving visceral revascularisation (by any method) followed by completion endovascular stent-grafting were identified. 'Related article' functions and manual reference searches were both conducted and additional articles added. Pre-defined inclusion and exclusion criteria were applied to the search results prior to individual patient data extraction. Where data was duplicated in different articles, the newest data set was included and the others excluded. Data synthesis was then performed and pooled-statistical analysis applied where possible.

Results: The last search was conducted on 1st February 2008. Between 1999 and July 2007, 55 papers describing TAAAR were identified. Six were excluded as they were either reviews, commentaries or contained insufficient individual patient data. One was excluded for excluding duplicated patient data. One hundred and eighty-eight individual patients were identified of which 145 were included (118M:78F). Average maximum TAAAR diameter was 6.87 cm. Thirty-day mortality was 13.4%. No irreversible spinal cord isch-

aemia was noted although transient paraparesis occurred in 2.7%. Visceral ischaemia (secondary to kinked bypass grafts) occurred in 2.7%. Average follow-up for this cohort was 7.8 months

Conclusions: This data synthesis provides the largest evidence base currently available for 'visceral hybrid' TAAARs. The procedure is currently being performed in over 30 centres globally and the results remain encouraging. The advent of fenestrated and branched graft technologies may see a decrease in the number of visceral hybrid procedures performed but it will remain a robust and viable method of TAAAR for this complex high-risk patient population.

V11-2

NIHR HTA/BUPA FOUNDATION/UNIVERSITY OF OXFORD ASYMPTOMATIC CAROTID SURGERY TRIAL-2

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Objectives: CEA has now become a well-recognised treatment for stroke prevention in symptomatic and in selected asymptomatic patients. CAS is a new method of treating carotid artery stenosis. Compared to CEA, CAS avoids surgical wound discomfort, is usually performed under local anaesthetic, could shorten hospital stay, and might reduce the risk of peri-procedural heart attack or stroke. Previous trials in symptomatic patients have not shown which procedure is safer, and there is no evidence comparing safety in asymptomatic patients. The European Stroke Initiative suggests that CAS should only be performed within randomised controlled trials. ACST-2 is a large, simple, randomised trial of CEA vs. CAS for stroke prevention. Primary objectives: to compare 1) the peri-procedural risks (MI, stroke and death) within 30 days of the procedure and 2) the long-term (up to 5 years) prevention of stroke, and of disabling or fatal stroke, during the years after CEA or CAS. Secondary objectives: an economic evaluation of both procedures will be conducted which will include a health-related quality of life analysis. Depending on numbers eventually randomised, data may permit the identification of sub-groups of patients in which one or other procedure is clearly preferable.

Methods: Collaborators send in track records documenting their total experience (a minimum of 25 CEA or CAS, to be performed in the last two years) giving stroke and non-stroke deaths within one month of the procedure. Each centre must have a collaborating neurologist (or stroke physician), vascular surgeon and stenting interventionalist. They will be jointly responsible for patient recruitment, treatment and follow-up. The stenting interventionalist can be a radiologist, cardiologist, surgeon or physician with specialist training in carotid stenting. A 'centre' can be organised between colleagues in neighbouring hospitals.

Results: Between March 2007 and January 2008, 63 track records were reviewed, 38 collaborators were approved for CAS and 48 approved for CEA. The trial opened for randomisation in January 2008 and already has patients enrolled. As the workload is minimal for the collaborator we are anticipating that thousands of patients will be randomised.

Conclusions: The future treatment of carotid artery stenosis will depend on getting large enough numbers from this trials in order to give generalisable answers indicating which patients are suitable and which are not for CAS. We plan to randomise at least 5000 patients giving results which will affect the treatment of millions of patients in the future.

V11-4

REMOTE ENDARTERECTOMY FOR TOTAL OCCLUSION OF THE SUPERFICIAL FEMORAL ARTERY

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Objectives: To analyse retrospectively the mid-term results of remote endarterectomy for total occlusion of the superficial femoral artery.

Methods: There were 16 males and 10 females: mean age was 72±6 years. The indications for the procedure were claudication in 18 cases and critical limb ischemia in 8. All patients underwent preoperative diagnostic angiography or magnetic-resonance-angiography to determine the location and extent of the disease. Clinical visit and Duplex-ultrasonography follow-up were performed at 6-months intervals during the first year, and once per year thereafter.

Results: Initial technical success was achieved in all patients. Two early femoro-popliteal re-thromboses were observed that required major amputation. The mean follow-up was 32 months. Five late occlusions occurred

requiring bypass procedure in three cases. Primary patency rate was 78%, 72%, and 63% at 12, 24, and 48-months, respectively. Results were better in patients treated for claudication compared to critical limb ischemia group, and statistically significant better results for patients with good distal runoff ($P=0.08$).

Conclusions: The five-year primary patency rate is at least similar to prosthetic above-knee bypass surgery. Remote endarterectomy also leaves open all other options for conventional bypass procedures.

V11-5

EVALUATION OF HYPERBARIC OXYGENATION THERAPY EFFECTS IN CHRONIC OCCLUSIVE DISEASE OF LOWER EXTREMITIES ARTERIES BY THE METHOD OF PERFUSION SCINTIGRAPHY 99M TC-TETROPHOSMINE

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Objectives: Arteriosclerosis is pathological process of artery (stenosis or occlusion) which develops the ischemic disease of lower extremities with the condition of hypoperfusion. The possibility to estimate the perfusion reserves has the significant prognostic importance. In our paper, estimation of the perfusion reserves was done by scintigraphy before and after the treatment of hyperbaric oxygenation (HBO).

Methods: Total are examined 13 patients, 10 male and 3 female, average age 63 years. At all of them the level of stenosis find by arteriography and all of them were chosen for HBO treatment without the possibility for surgery revascularization. At all patients was followed the perfusion reserve obtained by scintigraphy lower extremities (difference in a rest and in a load), before start of HBO treatment and 30 days after the last treatment. Perfusion scintigraphy was performed by radiopharmaceutical 99Tc-tetrophosmine, and results were read by Gamma camera. Hyperbaric oxygenation carried out in monoplace oxygen chambers BLKS-301, once a day lasting 60 min, on the absolute pressure 2.0 ATA, total 20 sessions.

Results: Comparing the subjective difficulties, claudication distance and perfusion reserve before and after the HBO treatment, next results were given: all patients confirmed subjective general improvement with decrease in discomfort in lower legs, easier standing of physical efforts and decrease of painful episodes. At all patient is significant prolonged the walk line for more than 300 m. Perfusion reserve show that at five patients (38.5%) was not significant improvement, but at eight patients (61.5%) the perfusion reserve was improved on both lower legs.

Conclusions: This paper had an aim to develop objective method for the estimate of perfusion reserve in the ischemic tissue, to give objective prognosis of the disease and the degree of the tissue damage and to give an estimate of success of hyperbaric oxygenation as the important therapy at the patients where surgery revascularization is not possible. Preliminary results show that scintigraphy can objective show success of the hyperbaric oxygenation. In our paper is confirmed the correlation subjective and clinical parameters with improvement in perfusion after the HBO treatment at 61.5% of patients.

V11-6

EXPERIENCE IN AUTOGENOUS RECONSTRUCTION WITH FEMORAL VEIN IN TREATMENT OF VASCULAR PROSTHESIS INFECTIONS

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Objectives: Prosthetic infection, is a serious complication in patients underwent to reconstructive vascular surgery, with high morbidity and mortality rates. After excision of infected graft, several methods of arterial reconstruction are available. We present our preliminary experience with autogenous reconstruction with deep femoral vein (DFV).

Methods: Treatment encompassed complete prosthetic excision and autogenous reconstruction using DFV alone (2 patients) or as spliced graft with both DFV (4 patients). The patient were all treated with antimicrobial therapy for several weeks.

Results: We have no perioperative deaths or amputation. All patients exhibited transient mild to moderate swelling of the donor limb. In the short-term follow-up, all patients were indagated with clinical examination, Duplex and CT-scan. All patient were alive without any sign of recurrent infection or aneurysmatic enlargement, with a primary patency rate of 100%. All donor limb were asymptomatic for venous congestion.

Conclusions: In our preliminary experience, reconstruction with the limb deep vein is a safe and attractive alternative to homograft and artificial conduit in treatment of prosthetic infection, with excellent adaptation to the aortoiliofemoral position.

V11-7

RECONSTRUCTION OF LEFT SUBCLAVIAN ARTERY AFTER COVERAGE DURING THORACIC ENDOVASCULAR REPAIR

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Objectives: Overstenting of the left subclavian artery in the endovascular treatment of the descending aorta is a generally applied method in patients suffering from type B dissection or aneurysm near the aortic arch. We give an account of our experience in the vascular reconstruction of the left subclavian artery after endovascular coverage.

Methods: Between the years 2000 and 2007, the implantation of 107 endovascular thoracic stentgrafts were performed in our department. In 59 patients (60%) overstenting of the left subclavian artery had been necessary.

Results: One-stage reconstructions of the left subclavian artery had to be performed in three patients, in one because of an isolated origin of left vertebral artery from the aortic arch, in two because of an arteria lusoria. Two-stage subclavian reconstructions were necessary in three patients with chronic arm ischemia either by subclavian transposition or by a carotido-subclavian bypass. Currently five other patients with a mild chronic ischemia or steal syndrome are treated conservatively.

Conclusions: The problem of coverage of the left subclavian artery may be underestimated especially in younger patients. Indication to one-stage reconstruction of the left subclavian artery by transposition or carotido-subclavian bypass are coverage of a lusoria artery, an isolated origin of left vertebral artery from the aortic arch, incomplete vertebral circulation because of stenosis/occlusion or a previous coronary IMA bypass. Reconstructions of the left subclavian artery was necessary in 18.6% of our patients. This high percentage may lead to further development of fenestrated or branched endografts.

V11-8

TYPE B AORTIC DISSECTION: ACUTE AND LONG-TERM OUTCOMES

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Objectives: The management of Type B aortic dissections is not well documented. We studied outcomes and factors predicting need for intervention.

Methods: Sixty-six consecutive patients (42 male, mean age 63) with Type B dissection (mean aortic diameter 5.4 (3-12.2 cm)) were isolated from a prospective database of acute aortic syndromes (2004-7). Mean follow-up was 6 (4-92) months. Patient characteristics (age, sex, diabetes, hypertension, hypercholesterolaemia, smoking, family history, collagen disorders, cardiac/cerebrovascular disease, previous dissection) were studied. CT-scans were examined for maximum aortic size and rate of dilatation/annum. χ^2 statistical analysis was performed.

Results: On presentation, 5 (7.6%) patients died from rupture before intervention. 25 (37.9%) required immediate intervention because of rupture, malperfusion or ongoing pain. Of these, 18 (72%) underwent aneurysm exclusion. Complete false lumen thrombosis occurred in 16 (88.9%). Malperfusion syndrome mandated renal artery stenting in 2 (8%) and lower limb revascularisation in 4 (16%). In-hospital mortality with immediate intervention was 8% (2/25). 43 (65%) entered a surveillance programme. Of these, 21 (48.8%) underwent late intervention mandated by aortic dilatation. This group required thoracic stenting (6), \pm revascularisation of the supra-aortic vessels from the arch (3), \pm visceral revascularisation (10) or open repair (2) with 0% mortality. In the surveillance group, females were significantly more likely to undergo intervention (75% (12/16) females vs. 33.3% (9/27) males, $P=0.035$). Fifty percent females vs. 8% males dilated >1 cm/annum ($P=0.008$). No other significant differences in patient characteristics between those requiring intervention and those managed conservatively were found.

Conclusions: Type B dissections require complex management pathways. Female sex was the only predictor of intervention during surveillance, due to a more rapid rate of aortic dilatation. These findings suggest that close surveillance is essential especially in females.

V11-9

MENDELIAN RANDOMIZATION AND GENOTYPE-PHENOTYPE ASSOCIATION: THE CAUSAL RELATIONSHIP BETWEEN METHYLENE TETRAHYDROFOLATE REDUCTASE (MTHFR) C677T POLYMORPHISM AND ABDOMINAL AORTIC ANEURYSM (AAA)

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Objectives: The Methylene Tetrahydrofolate reductase (MTHFR) C677T polymorphism results in a substitution of thymidine nucleotide for cytidine at position 677 of the MTHFR gene resulting in a change from the wild type 'C' allele to the risk (minor) 'T' allele. The latter results in homocysteinaemia which has been implicated in the pathogenesis of abdominal aortic aneurysm (AAA). Studies have also implicated the MTHFR genetic polymorphism in AAA formation although this is not consistent. Our aim is therefore, to determine if there is a causal association between MTHFR genetic polymorphism and AAA within the framework of mendelian randomization. Mendelian randomization is the random assignment of an individual's genotype from his or her parental genotypes that occur before conception. A causal relationship between MTHFR and AAA is therefore, free from bias and confounding just like a randomized controlled study.

Methods: This is a retrospective case-control study involving white caucasian participants. Our cases are those with imaging confirmed AAA whilst the controls are free from AAA. We recruited 816 study participants comprising 362 controls and 454 cases with a mean age of 70.21 years (CI: 69.587-70.55) We obtained some blood specimen from the participants from which we extracted genomic DNA. We subsequently genotyped the DNA sample for the MTHFR polymorphisms using a polymerase chain reaction (pcr) methodology. The pcr products were thereafter subjected to overnight restriction fragment length digestion with the restriction enzyme Hinf1. The resulting products were then run on a 2% agarose gel electrophoresis to yield the homozygote 'CC' and 'TT' genotypes and heterozygote 'CT' genotype.

Results: The distributions of the obtained genotypes (cases vs. controls) were as follows: CC (222 vs. 204), CT (189 vs. 132) and TT (43 vs. 26) accounting for allele frequencies of 0.70 (± 0.015) and 0.75 (± 0.016) respectively. The genotypes are in Harding-Weinberg equilibrium ($P=0.48$ for controls and $P=0.78$ for cases). The Allele difference odds ratio between cases and controls is 1.275 (CI: 1.024-1.587, $P=0.0296$) and the genotype odds ratio (CT+TT vs. CC) is 1.349 (CI: 1.022-1.781, $P=0.034$) and 1.254 ($P=0.032$) after correction for multiple testing.

Conclusions: We have shown that the MTHFR C677T genetic polymorphism is causally associated with AAA pathogenesis. Hyperhomocysteinaemia resulting from this polymorphism is amenable to folate therapy. Therefore, offering MTHFR C677T polymorphism genotyping test to people with other risk factors for AAA formation could prove a useful risk reduction strategy.

V11-10

A NEW INDICATION FOR AORTOFEMORAL BYPASS

M. Davins, S. Llagostera, J.M. Romero, J. Dilmé, J.R. Escudero, M. Sirvent, P. Altés

Hospital de la Santa Creu i Sant Pau, Barcelona, Spain

Objectives: Patients undergoing hemodialysis have a lower survival rate than those who have received a renal transplant. Mortality in hemodialysis cases is approximately 14.5%, while the rate for transplant recipients is only 1.5%. Iliac artery calcification is currently one of the exclusion criteria for renal transplant. The purpose of this study is to examine the viability of aortofemoral bypass as a means of making patients with significant iliac calcification eligible for renal transplantation.

Methods: Nine patients were named to receive aortofemoral bypass, 7 patients requiring bypass from the level of the thoracic aorta, 2 from the infrarenal level. All patients in the study group had significant calcification of aorta and iliac arteries (as assessed by CT), and so had been excluded as candidates for renal transplant. Revascularization was performed using a Dacron prosthesis.

Results: Revascularization was carried out in each of the study patients, with 100% of patency. To date there has been no mortality among the group, though one study patient developed complications necessitating splenectomy. All patients were subsequently named as renal transplant candidates, and at this time five have received transplants. All of the transplant group presented good viability of the transplanted kidney.

Conclusions: Renal transplantation is the only known method for improvement of survival and quality of life for hemodialysis patients. We believe that the morbidity and mortality risks of aortic bypass are justified for such patients, but they must of course be informed of the risks.

V11-11

ARTERIAL REVASCLARIZATION AND COMPRESSION THERAPY IN THE TREATMENT OF MIXED ARTERIAL/VENOUS LEG ULCERS

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Vascular Department, Surgical Clinic, Clinical Centre Nis, Serbia

Objectives: About 3%-5% of patients with venous ulcers have combined arterial and venous insufficiency. The aim of this study was to show the results in the treatment of mixed arterial/venous ulcers with and without compression therapy after performing arterial revascularization procedures.

Methods: A total of 27 patients with mixed arterial/venous ulcers were randomized into two groups: treatment group (14 patients) and control group (13 patients). All 27 patients had an active ulcer in the gaiter area. Mean ABPI was preoperatively 0.53 and 0.49 in patients in the treatment group and 0.50 and 0.52 in patients in the control group. Arterial revascularization procedures were performed in all 27 patients included in the study. Thirty days after operation patients in the treatment group underwent compression treatment while patients in the control group did not receive any additional treatment. The results in the treatment of ulcers in these two groups were analyzed in terms of healing rate, time for healing.

Results: Postoperative mean ABPI was 0.85 and 0.84 in patients in the treatment group and 0.86 and 0.92 in patients in the control group. The healing rate was 71.4% (10/14) in the treatment group, and 38.5% (5/13) in the control group ($P<0.01$). Median ulcer healing time was 68 days (27-141 days) in the treatment group vs. 89 days (41-146 days) in the control group ($P<0.05$).

Conclusions: The study suggests that mixed arterial/venous ulcers could be successfully treated with compression therapy after performing arterial reconstructive procedures.

April 24th-25th-26th, 2008

8:00-18:00

Cardiac Posters

CP1

IMPACT OF TRICUSPID VALVE DISEASE IN THE ELDERLY CARDIOMYOPATHY: NOTE OF CAUTION DURING SEPTAL MYECTOMY

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Objectives: The outcomes of tricuspid valve [TV] surgery in the elderly and younger cohorts were compared.

Methods: All 130 consecutive patients undergoing TV surgery between October 2004 and July 2007 in a retrospective observational study were considered in two groups: group 1 included patients aged below 70 years (mean 55.76±10.6 years) and group 2 patients aged 70 years or more (mean 77±5.3 years). Preoperative, operative and all outcome parameters were compared. TV surgery was indicated due to significant tricuspid regurgitation or disease. Follow-up extended upto three years.

Results: Ring annuloplasty was done in 120 patients, while TVR (tricuspid valve replacement) was needed in 10 patients. The primary procedure was mitral valve replacement/repair in both groups. The main indication for surgery was severe mitral regurgitation due to degenerative mitral disease in group 1 while more patients had rheumatic mitral disease in group II. The elderly cohort had significantly more hypertension, diabetes, higher EuroSCORE, postoperative atrial fibrillation and behavioral confusion. Mortality was similar in both groups (12.9% in group 1 vs. 13.3% in group 2, $P=0.5$). Elderly patients had no TS, IE but had more functional TR and did not undergo any TVR. Associated coronary revascularization was more frequent in them. Incidence of aortic valve surgery was similar in both groups. Impact of associated of TV surgery had significant additive mortality risk in the younger cohorts but not in the elderly.

Conclusions: The additive mortality risk impact of associated of TV surgery was seen in the younger patients, even though the elderly represented a sicker group of patients in this study. However, the quality of life in the survivors remained equivocal in the older cohorts in intermediate term follow-up.

CP2

SURGICAL CHALLENGES FOR URGENT APPROACH IN PENETRATING HEART INJURIES

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Objectives: The aim of this clinical study is to assess the characteristics of penetrating heart injury and its surgical challenges for urgent surgical approach. **Methods:** Seventeen cases suffering from penetrating heart wounds were evaluated retrospectively in department of Cardiovascular Surgery between 1996-2004. All patients were male. The age of patients ranged from 19 to 36 years, with a mean age of 23.6±5 years.

Results: Median sternotomy, left anterior thoracotomy and right anterior thoracotomy were performed to control the bleeding or to reach to the heart for internal cardiac massage in five, eleven and one patients, respectively. Right ventricle was the most commonly involved site of injury ($n=12$) followed by left ventricle ($n=4$) and right atrium ($n=3$). Left atrial injury was not seen. Mortality rate was 29% (five cases).

Conclusions: Although the most important factor affecting mortality in penetrating heart injuries is rapid transport, an urgent approach applied by a well trained specialist team decreases mortality and morbidity rate. The patient should be quickly evaluated and time should not spent with laboratory tests for exact diagnosis. We think that internal cardiac massage would be a better choice, and external cardiac massage should be performed with the intention of saving time to explore the patients surgically.

CP3

THE ROLE OF MODIFIED COMPUTERIZED THROMBOELASTOGRAPHY IN THE PRESERVATION OF BLOOD COMPONENTS IN CARDIAC SURGERY

N.P. Theakos, M. Argiriou, A. Roussakis, V. Panagiotakopoulos, I. Koukis, I. Kouerinis, G. Benakis, C. Charitos

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Objectives: Thromboelastography (TEG) is a point-of-care viscoelastic measure of clot formation and dissolution that measures platelet function, clot formation kinetics, platelet-fibrinogen interaction, and fibrinolysis. Although TEG has been used in several studies to predict blood loss in cardiac surgery, the results from these studies are not uniform. The transfusion of blood and haemostatic blood components remains mostly empiric with considerable variation among institutions because of a perception of inadequate haemostasis, while the differential diagnosis between a surgical cause for abnormal bleeding and a haemostatic disorder after CPB remains extremely difficult. The objective of this study was to evaluate the contribution of TEG in the preservation of blood components in patients submitted to cardiac surgery.

Methods: From September 2006 through December 2007, 184 patients submitted to cardiac surgery in our department (CABG: 103, single valve replacement: 46, multiple valve replacement: 9, combined CABG and valvular procedure: 11, thoracic aortic replacement: 7, Bentall: 3, and cardiac reoperation: 5) were prospectively studied for coagulation disorders and the quantity of blood components transfusions. At the induction of anesthesia all patients received prophylactic antifibrinolytic therapy with aprotinin (Hammersmith protocol). Transfusion requirements were recorded for 48 h postoperatively. Baseline coagulation tests in all patients included platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), fibrinogen level, and D-Dimers. In 95 randomly selected patients, coagulation was additionally monitored with TEG (Group B). The individual variables of TEG that were measured included reaction time (R), A-angle, K-coefficient, maximal amplitude (MA), lysis index at 30 min (LY30), and coagulation index. All variables were processed in real time by the software. Data from laboratory-based tests were used to guide transfusion therapy in Group A (control group, $n=89$) patients. On the contrary, data from TEG were used to guide transfusion therapy in Group B patients, 15 min after protamine administration. The data were analyzed for differences between the two groups with regard to blood and haemostatic blood components transfusions.

Results: The total quantity of erythrocyte concentrates (EC), fresh frozen plasma (FFP), and platelets (PLT) units transfused 48 h postoperatively decreased by 27.3% (EC: 4.4 vs. 3.2 units), 59.2% (FFP: 4.9 vs. 2.0 units), and 76.6% (PLT: 4.7 vs. 1.1 units) respectively, in patients of Group B.

Conclusions: The induction of TEG as a routine monitoring test of coagulation in patients submitted to cardiac surgery resulted in significant decrease of blood and haemostatic blood components transfusions in the immediate postoperative period.

CP4

SURGICAL TECHNIQUES IN PATIENTS WITH DISSECTION ASCENDING AORTA ANEURYSM

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Objectives: Assess results of the surgery for dissection aneurysms of the ascending aorta and choose a proper technique for such pathology.

Methods: From 2003 to January 2008, 110 patients have been operated on for AAA, there have been 44 cases with aortic dissection. Age was 26-70 years (50±12). There were 37 males (84%) and 7 females (16%). Thirty patients (68%) had grade III of aortic regurgitation, 14 (32%) had grade IV. AAA sizes was 48-92 mm (68±13 mm). Minimal EF was 38% (51±5%). Aortic dissection type I (DeBakey) was found in 20, type II in 24 patients, in acute (67%) and subacute (33%) stages. Twenty-nine (66%) patients had FC III, 15 (34%) - IV (NYHA). Etiology: atherosclerosis - 23 patients (52%), Marfan's syndrome - 16 (36%), connective tissue dysplasia - 5 (12%). The Bentall operation was made in 13 patients (30%). In one patient we performed Bentall+arch prosthesis+aortic coarctation resection. Valve-sparing methods: David's operation in 8 (18%) cases, supracoronary prosthesis of AA - 17 (38.6%), Wolfe procedure - 5 (11.4%). Valve conduit Medinge-2 with Vascutek was used in the Bentall operation; Vascutek was used in reconstruction of aortic valve function and in supracoronary replacement of aorta. The operation scheme was 'aorta - right atrium' and 'femoral artery- right atrium'. Hypothermia was 20-30 °C. Ante-retrograde cardioplegia was used (Custodiol). Mean cross-clamping duration was 117±41 (60 to 209 min). Circulatory arrest was used in 25 (12 to 113 min (39±31)). Mean pump time was 188±71 min (90 to 325 min).

Results: Two patients died during the immediate postoperative period (4.5%). One patient died due to bleeding, 2-polyorgan insufficiency.

Conclusions: To choose surgery technique in patients with aortic dissection is defined in every single case. Valve-sparing methods have a number of advantages as they are more physiological but more technically complicated in performance. They demand experience and skill in manipulations with aortic root and should be performed with intact aortic valve.

CP5

TWO CASES OF ALCAPA TREATED WITH TAKEUCHI AND MODIFIED TAKEUCHI OPERATION

A. Kutsal¹, H. Aydin¹, K. Ozisik¹, V. Ulusan², M. Koc¹, B. Ocal³, U.A. Orun³, F. Senocak³

¹Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Cardiovascular Surgery, Ankara, Turkey; ²Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Anesthesiology, Ankara, Turkey; ³Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Pediatric Cardiology, Ankara, Turkey

Objectives: Anomalous left coronary artery from pulmonary artery (ALCAPA) is a rare congenital cardiac malformation. It occurs in 1 in 300,000 live births. More than 90% of affected children do not survive infancy without surgical treatment.

Methods: Case Report 1: A 3-year-old girl was referred to our hospital with exertional dyspnea and fatigue and was referred for further investigation. The echocardiography revealed markedly dilated tortuous right coronary artery, dilated left ventricle with moderate reduction in systolic function. Angiography showed a severely dilated right coronary artery with an extensive collateral system filling the left coronary system with retrograde drainage to the pulmonary artery via an anomalous left main coronary artery. During surgery, the anomaly was corrected with takeuchi procedure. Case Report 2: A 4-month-old boy was referred to our department with a history of congestive heart failure and on examination he was found to be dyspneic with a continuous murmur on left border of the sternum. During surgery, after median sternotomy and pericardiotomy it was seen that there was a AP window, and RCA originating from anterior aspect of pulmonary artery. The flow to the right coronary artery was redirected from the aorta with a patch through the AP window.

Conclusions: An embryological defect during foetal cardiac development leads to the left coronary artery arising from the pulmonary artery instead of the aorta. At birth the infant is asymptomatic but as the pulmonary artery pressure decreases during the neonatal period, desaturated blood flows under low pressure from the pulmonary artery via the left coronary artery to the left ventricle. ALCAPA can occur in isolation or in conjunction with other congenital cardiac lesion such as tetralogy of Fallot, ventricular septal defect (VSD), atrial septal defect (ASD) or pulmonary atresia. Dilated cardiomyopathy is an important differential diagnosis and may also arise as a result of ALCAPA. In patients with ALCAPA, myocardial perfusion is dependent on the extent of the collateral circulation and on the pulmonary vascular resistance. In patients with ALCAPA, myocardial perfusion is dependent of the collateral circulation. During infancy if a good collateral system is not established the myocardium supplied by the left coronary artery becomes ischaemic leading to infarction and fibrosis resulting in ventricular dysfunction, mitral regurgitation and life threatening arrhythmias. These patients usually present in cardiogenic shock in infancy and would not survive without corrective surgery.

CP6

FOUR CASES OF COR TRIARIATUM TREATED BY SURGICAL RESECTION

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¹Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Cardiovascular Surgery, Ankara, Turkey; ²Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Anesthesiology, Ankara, Turkey; ³Dr. Sami Ulus Pediatric Research and Training Hospital, Departments of Pediatric Cardiology, Ankara, Turkey

Objectives: Cor triatriatum is a rare congenital cardiac anomaly. Cor triatriatum sinister was first described by Church in 1868 and cor triatriatum dexter was first described by Rokitansky in 1875, and the first surgical repair was performed by Vineberg in 1956. The term cor triatriatum was first used by Borst in 1905. It is associated with other cardiac defects in up to 50% of cases.

Results: Case Report 1: A 10-year-old girl was referred to our department with congestive heart failure. The echocardiography demonstrated a diaphragm in left atrium and primum atrial septal defect (primum ASD). The Angiography showed ASD and 9 mmHg pressure gradient in left atrium. During the operation primum ASD was repaired with pericardial patch and left atrial membran was resected. Case Report 2: A 5-year-old girl was referred to our department with dextrocardi and ASD. The echocardiography demonstrated dextrocardi, atrial septal defect (partial ASD) and partial anomalous pulmonary venous drainage. During the operation it was seen that there was a diaphragm at left atrium and it was resected, ASD was repaired

with primary closure. Case Report 3: A 3-year-old boy was referred to our department with murmur. The echocardiography demonstrated left atrial and ventricular dilatation and ASD. During the operation it was seen that there was a diaphragm in right atrium, this membran was resected and ASD was repaired with primary closure. Case report 4: A 9-year-old boy was referred to our department with murmur. The echocardiography demonstrated right atrial membran superior chamber of right atrium was communicate with vena cava superior and vena cava inferior and large ASD was detected. During the operation right atrial membran was resected, ASD was repaired with pericardial patch.

Conclusions: In the most common form, cor triatriatum sinister, the left atrium is divided into a proximal and distal chamber. Both chambers are separated by a diaphragm with restrictive ostia, with the pulmonary veins draining into the proximal chamber, distal chamber containing the mitral valve and left atrial appendage. Cor triatriatum dexter is described as subdivided right atrium because of the persistence of the right valve of sinus venosus. In embryologic life the right valve of the sinus venosus divides the right atrium and later this valve moves caudally, leaving crista terminalis and the eustachian valve and the besian valve as its remnants. In the cases of cor Triatriatum the membrane must be resected in order to relieve the obstruction to the blood flow.

CP7

THE MODIFIED BLALOCK-TAUSSIG SHUNT FOR NON CURABLE CONGENITAL HEART DISEASE: A 7-YEAR EXPERIENCE

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Objectives: Tetralogy of Fallot (TOF) is now curable in both developed and most developing countries. Modified Blalock-Taussig Shunt (MBTS) constitutes a palliative surgery of a multitude of Complex Congenital Heart Diseases (CCHD) associating a reduced pulmonary blood flow. The purpose of this work is to appreciate our surgical results of MBTS for Complex Congenital Heart Diseases others than TOF when complete repair is impossible.

Methods: Between January 1999 and January 2007, 49 patients (24 males and 25 females) underwent MBTS for non-curable CCHD. The patients for whom the complete cure is planned in a second operating time were excluded from the study. The mean age was 5.4 years±5.1 years (range: 4 days-19 years). The mean postoperative follow-up was 3.6 years±1.6 years (92% complete).

Results: All patients underwent surgery for a symptomatic congenital heart disease with reduced pulmonary blood flow. Tricuspid Atresia comprised 37% (n=18) of the cases, the remaining included, univentricular heart complex 16% (n=8), Double Outlet Right Ventricle 14% (n=7), Pulmonary Atresia with ventricular septal defect (VSD) 12% (n=6), Transposition of the Great Arteries with VSD 10% (n=5), and others 10% (n=5). Other conditions were associated: Atrial Septal Defect 6%, VSD 6%, Great Arteries malpositions 4%, congenital abnormalities of the aortic arch 4%, and others 10%. The aortic arch was on the left in 82% and on the right in 18%. Thirty shunts were performed on the right side and 19 on the left. A 6-mm polytetrafluoroethylene graft was used in 55%, 5-mm in 43%, and a 4-mm graft in one case. Hospital mortality was 4% and late mortality was 4%. Acute shunt failure occurred in one case reconducted immediately to surgery. During follow-up all surviving patients had improvement in either functional class and cyanosis. Two patients underwent redo surgery; one for shunt thrombosis and one for a complementary shunt (3 years after the first shunt).

Conclusions: We conclude that MBTS is a relatively safe palliative procedure, requiring few resources. The age does not seem to be a prognosis factor in this study. Surgical outcomes are excellent for CCHD associating a reduced pulmonary blood flow. This series shows an acceptable early and late mortality rate with clinical improvement in all surviving patients.

CP8

10 YEAR RESULTS FOR PRIMARY BYPASS GRAFTING (CABG) WITHOUT CARDIOPULMONARY BYPASS (CPB) PRIOR TO STABILIZATION DEVICES: HISTORICAL REVIEW

G.D. Trachiotis

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Objectives: Clinical outcomes regarding off bypass revascularization is limited. Angina and death long-term remain standard clinical markers to gauge success of open heart surgery.

Methods: We report the outcome of 280 patients undergoing primary CABG without CPB between 6/85-6/95 with follow-up extending beyond 10 years. The mean age was 62±11 years, 73% were males, 49% had hypertension, 18% had diabetes, and 73% had normal LV function. All patients were assessed to be completely revascularized by off bypass CABG. CABGX1 was performed in 72%, CABGX2 in 27%, and CABGX3 in 1%. Revascularization was selected for patients with principally anterior and anterior lateral (LAD, Dx) disease. All operations were performed mostly by one surgeon (abstract dedicated to AP). Follow up data was obtained by questionnaire and available for 153/280 (56%) patients.

Results: Variable hospital ($n=280$) long-term ($n=153$), Follow-up 30 days 65±67 months (8-132), Mortality 1.8% 3.9%, LAD 83% 91%, IMA usage 78% 84%, Angina 7.8%, MI. 4%. 6%, Redo CAB 0%. 6%, Survival 98% 96%.

Conclusions: Selected patients can obtain good short and long-term symptom control and survival with complete coronary revascularization off bypass. CABG off bypass (OPCAB) remains a useful tool in open heart surgery. The results of this early utility of OPCAB in select patients led to its widespread application after industry produced coronary stabilizers and cardiac positioners in the late 1990s. OPCAB accounts for >65% of our coronary revascularization procedures.

CP9

A RARE FINDING DURING CORONARY ARTERY BYPASS SURGERY: RIGHT ATRIAL THROMBUS

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Objectives: We present a male patient who underwent coronary artery bypass grafting (CABG) and tricuspid valve repair with the diagnosis of acute inferior myocardial infarction and severe tricuspid insufficiency, and in whom a right atrial thrombus was detected intraoperatively.

Methods: A 65-year-old male patient with chest pain was hospitalized with the diagnosis of acute inferior myocardial infarction. ECG showed sinus bradycardia. Severe coronary artery disease requiring CABG was diagnosed by coronary angiography. Severe tricuspid regurgitation in three degree was diagnosed by transthoracic echocardiography. He was operated three weeks later. Intraoperatively, first, CABG to four vessels with cardiopulmonary bypass was done. Later, when right atriotomy was done to perform De Vega tricuspid annuloplasty, a diverticula shaped mass in 4.5x6 cm diameter in the right atrial appendage was seen. The right atrial mass was excised and De Vega tricuspid annuloplasty was done.

Results: Pathological examination revealed that the mass was a thrombus. There was no any complication in the postoperative period and the patient was discharged on the seventh day.

Conclusions: Right atrial thrombus is less often seen than left atrial thrombus. In addition, it rarely develops in a patient with sinus rhythm. Although right atrial thrombus is rarely seen, it may cause life threatening thromboembolic complications. Right atrial appendage is hard to image consistently by transesophageal echocardiography and almost impossible to image by transthoracic echocardiography. Thus, the diagnosis of thrombus and masses in the right atrial appendage is very difficult prior to CABG. We suggest that the possibility of right atrial thrombus should be kept in mind in the patients undergoing CABG with the history of recent inferior myocardial infarction. When a right atrial thrombus is obtained during the operation, we think that it should be removed to avoid possible pulmonary embolism.

CP10

BEATING HEART CORONARY BYPASS PROCEDURE IN A HEPATIC HYDATID CYSTIC PATIENT

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Objectives: Coronary bypass operations (CABG) can be performed with acceptable risks in the patients with diseases of different systems. Cardiopulmonary bypass has been reported to have many effects on the immune system with conventional CABG.

Methods: In this study, we reported our case with coronary artery disease who underwent beating heart CABG under the light of current literature.

Results: She was diagnosed as hydatid cystic disease of liver and cholelithiasis priorly by Department of General Surgery and preoperative investigations for these diseases revealed coronary artery disease.

Conclusions: Concerns about systemic inflammatory response to CPB and its consequences include possible systemic dissemination because of the immune system or direct vascular dissemination. We suggest that avoidance of CPB is beneficial for the treatment. Off-pump coronary artery surgery clearly has a place and can be a successful procedure for these patients.

CP11

AN ADDITIONAL VALVE FOR INTERVENTIONAL TREATMENT OF THE MITRAL VALVE

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Objectives: Due to anatomical reasons, interventional placement of heart valve prosthesis in mitral position is challenging. We aimed for a totally new approach, inserting a valve-bearing prosthesis strutting on the entire left atrial wall, the mitral ring and the pulmonary veins. A design study was performed and the resulting prosthesis evaluated in the animal.

Methods: Prosthesis design was derived from moulds of porcine left atria. A nitinol-skeleton was sutured onto interlaced yarns of polyvinylflourid. Into the resulting collapsible hollow body a biological valve was sewn. Animal experiments: In five pigs (50 kg), under general anesthesia, a thoracotomy was performed. Under extracorporeal circulation, the left atrium was incised. Prior to implantation, an artificial regurgitation was created by an incision in the posterior mitral leaflet. The compressed prosthesis was inserted into the left atrium and released. After re-suturing the atrium extracorporeal support was tapered. Echocardiographic and radiologic evaluations were carried out. After euthanasia, autopsy was performed.

Results: Echocardiography demonstrated the functionality of the prosthesis parallel to the native valve. Regurgitation was reduced. Angiographically, antegrade flow through the fully expanded prosthesis was visualized. Autopsy revealed proper positioning without major trauma. No significant thrombosis occurred.

Conclusions: We could display feasibility and functionality of our new left atrial mitral-valve prosthesis. Left atrial exclusion and placement of an additional valve in mitral position by a valve-bearing hollow body were demonstrated. Further development is needed to optimize design and procedure for percutaneous or transapical implantation.

CP12

RIGHT TO LEFT SHUNT THROUGH A PATENT FORAMEN OVALE LEFT OPEN IN THE MANAGEMENT OF ACUTE RIGHT HEART FAILURE AFTER HEART TRANSPLANTATION: REPORT OF A CASE

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Objectives: Pulmonary hypertension is a risk factor for mortality in heart transplantation due to elevated postoperative right heart failure. Various treatment modalities have been used in the management of pulmonary hypertension in the perioperative period. We report a case of successful management of acute right heart failure after orthotopic heart transplantation by decompression of the right ventricle through the patent foramen ovale of the donor heart and inhalation of iloprost.

Methods: Case Report. A 15-year-old patient with a history of dilated cardiomyopathy was referred to our clinic as a candidate for heart transplantation. An echocardiogram revealed an ejection fraction of 23%. PAP was 25/5 mmHg in cardiac catheterization. The decision was made to perform heart transplantation. The patient did not attend regular follow-up visits. The donor was a 21-year-old girl who sustained anoxic brain death and a PFO was noted in the atrial septum of the donor heart. PAP of the recipient measured intraoperatively before the cardiopulmonary bypass was established, was found to be 70/36 mmHg. During the operation, a decision was made to leave the PFO in the donor atrial septum open in order to decompress the failing right heart during weaning from cardiopulmonary bypass. Moderate-dose positive inotropic and vasodilator agents were administered in the early postoperative period. She was extubated on the 1st postoperative day. Echocardiography demonstrated a good left ventricular function and minimal right-to-left shunting. The

mean pulmonary artery pressure was 17 mmHg and central venous pressure was 4 mmHg.

Results: The patient developed right heart failure on postoperative day 4, while she was still on moderate-dose positive inotropic treatment together with low-dose vasodilator agents. A transthoracic echocardiogram revealed moderate tricuspid and mitral regurgitation, a moderate right-to-left shunting and a mean PAP of 45 mmHg. She was started on ventricular pacing and epinephrine infusion, intravenous diuretic and iloprost inhalation treatments were also administered. The mean PAP was 16 mmHg in cardiac catheterization on postoperative day 10. Echocardiography demonstrated minimal right-to-left shunt through the PFO. A decision was made to manage the PFO conservatively. After the patient was discharged, the follow-up echocardiograms revealed no flow through the PFO.

Conclusions: The decompression of the right ventricle through PFO and iloprost inhalation may be effective alternatives in the management of pulmonary hypertension during weaning from cardiopulmonary bypass or in the intensive care unit after orthotopic heart transplantation. PFO may be closed using a transcatheter septal occlusion device, after the patients condition is stabilized.

CP13

AUTOLOGOUS INTRACORONARY MONONUCLEAR BONE MARROW CELL TRANSPLANTATION IN PATIENTS WITH DILATED CARDIOMYOPATHY

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Objectives: It is not quite clear if the intracoronary delivery of autologous bone marrow mononuclear cells is actually effective in patients with dilated cardiomyopathy.

Methods: Intracoronary infusion of autologous bone marrow mononuclear cells was performed in 10 patients during coronary angiography. All of them had severe heart failure due to dilated cardiomyopathy. Each patient had received optimal medical treatment during 3-12 months before catheterization. On average, each patient received 0.7-1.9 million cells CD34+.

Control group (10 patients with dilated cardiomyopathy) received medical treatment.

Results: We observed clinical improvement in all 10 patients of the study group with decreasing of the functional class of heart failure from the III-IV stage (NYHA) to the II stage after 6-12 months. Echocardiography revealed decrease of end-diastolic diameter of left ventricle (7 of 10 patients) and end-systolic diameter (10 of 10 patients) and augmentation of global ejection fraction (10 of 10 patients) of left ventricle. Positron emission tomography and single-photon emission computer tomography study of myocardium showed improvement of perfusion and metabolic myocardial activity in patients after 6-12-24 months.

Clinical assessments in the control group found temporary improvement in majority of patients during first year of follow-up. But dramatically worsening of heart failure symptoms led to 60% overall mortality after three year in control group. Three year overall mortality was 30% in the group of autologous bone marrow mononuclear cells.

Conclusions: intracoronary infusion of freshly derived autologous bone marrow mononuclear cells can be considered to be an efficient and safe approach to the restoration of the myocardium as adjunctive therapy to optimal medical treatment in patients with dilated cardiomyopathy.

CP14

INITIAL RESULTS OF MONONUCLEAR CELLS TRANSPLANTATION FOR ISCHEMIC CHRONIC MYOCARDIOPATHY

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Objectives: To present an initial series of patients with severe chronic ischemic cardiomyopathy treated with CABG and intramyocardial autologous bone marrow mononuclear cells.

Methods: Five sequential patients with chronic ischemic cardiomyopathy and no more than 35% of ejection fraction by bidimensional echocardiography and at least one coronary artery with indication of surgical treatment were included in this study.

Clinical evaluation, bidimensional echocardiography and SPECT images were acquired at pre-operative time, three and six months after surgery.

The variables were functional class of cardiac insufficiency, ejection fraction by Simpson and MUGA, segmental contractility and myocardial viability. The revascularized area is the control.

Results: The mean age was 62-year-old (52-73), four males and one female. Left anterior descending artery was used in four patients. Saphen vein graft was used in three patients (no radial artery was used). No deaths occurred at intra-hospital time. At clinical evaluation, every patient were better in functional class. As it was expected, the ejection fraction was better, mainly because of revascularized areas. According to the segmental contractility, areas that received mononuclear cells had also benefits, similarly to the revascularized ones but with no statistic significance due to low sample.

Conclusions: The cellular therapy is a worldwide growing subject with promising results for treatment of end-stage ischemic cardiomyopathy. This technique combined with CABG is safe and our results are in accordance with the literature.

CP15

ACUTE PERICARDITIS AS PRESENTATION OF A RARE CARDIAC TUMOR

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Objectives: Synovial sarcoma is a rare cause of pericardial tumor. We present a case where this malignant disease presented mimicking pericarditis and surgery was performed to diagnose and treat the patient.

Methods: A 54-year-old female with the only know medical condition of hypertension and working in a retirement home presented to the emergency department for a 21 days low-grade fever with musculoskeletal pain and oppressive retrosternal pain. She had previously received NSAID, broad spectrum antibiotics. In the physical examination a pericardial rub was noted. High levels of acute reactant phase proteins were found, with negative autoantibodies, rheumatic factor. In a CT scan a tumor 85x96 mm was found in the left side of the pericardium with displacement of the pulmonary trunk, left atrium and left atrial appendage, and no intrabdominal pathological findings.

Results: The mass was confirmed by MNR and the patient taken to the OR where a median sternotomy was performed, and a jelly like material found in the pericardial sac. Once confirmed by intraoperative biopsy the diagnoses of malignancy, the tumor was excised as far as technically feasible and the patient discharged uneventfully. The diagnosis was made in the pathology department of Synovial Sarcoma with t(18, X) and the patient is actually receiving chemotherapy with complete remission.

Conclusions: Synovial sarcoma is a rare cardiac tumor, sometimes mimicking acute pericarditis and a high degree of clinical suspicion is needed to diagnose it and treat it.

CP16

BLUNT CHEST TRAUMA AND RIGHT ATRIAL RUPTURE

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Objectives: Blunt cardiac trauma is the leading cause of fatalities following motor-vehicle accidents and its mortality rate is high.

Methods: Early use of echocardiography for the initial assessment of severely injured patients has facilitated to detect the presence of hemopericardium, cardiac tamponade and associated cardiac injuries.

Results: In this study, we report a case of a 27-year-old male who suffered a right atrial rupture by blunt chest trauma following motor-vehicle accident and isolated right atrial rupture with cardiac tamponade.

Conclusions: We present our successful surgical treatment under light of literature.

CP17

POSTOPERATIVE COMPLICATIONS AFTER SURGERY OF CHRONIC CONSTRICTIVE TUBERCULOUS PERICARDITIS

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Objectives: Today, pericardiectomy is a safe procedure with available techniques. Generally, early death risk postoperatively is more than 2% in many

constrictive pericarditis cases. Postoperative survival is related with age, gender and race and ranged between 55% and 90%.

Methods: We reviewed 39 consecutive patients with constrictive tuberculous pericarditis with large calcific deposits who underwent surgery from January 1993 to January 2007. Twenty-seven of them were men (69.2%) and 12 were women (30.8%). The average age was 39.6 years.

Results: Postoperative complications were arrhythmia, low cardiac output, acute renal failure, and acute respiratory distress syndrome. The early operative mortality rate was 10.2% (4 patients); the causes of early death were severe low-cardiac-output syndrome (2 patients), acute renal failure (1 patient) and acute respiratory distress syndrome (1 patient). Indeed, we found no postoperative recurrence of CCP in any of our patients during late follow-up.

Conclusions: Conventional open pericardiectomy via the median sternotomy, which enables a safer, wider, and more effective approach and it relieved the symptoms and altered the hemodynamic findings.

CP18

MULTI-SLICE TOMOGRAPHIC DIAGNOSIS OF CORONARY-PULMONARY ARTERY FISTULA: A CASE REPORT

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Objectives: Coronary-pulmonary artery fistula is an uncommon cardiac anomaly, usually congenital. Most coronary-pulmonary artery fistulas are clinically and haemodynamically non-significant and they are usually found incidentally. Nevertheless, sometimes they can result in serious consequences including myocardial ischemia, myocardial infarction or sudden death.

Methods: We report the case of a 65-year-old woman who was admitted to our hospital because of the onset of dyspnea and angina. On arrival at our institution, she did not have chest pain or dyspnea and she did not refer other symptoms. She undergone a serial examinations such as physical and blood exams, ECG and a 2-dimensional transthoracic echocardiography which resulted to be in the limits of normality.

Results: The patient refused a coronary artery angiography, so we perform a 64-slice computed tomography, which revealed the presence of normal coronary arteries and an abnormal long fistulous communication between the medium segment of the left main coronary artery and the pulmonary trunk. The anatomy of the fistula was demonstrated in detail by the MSCT scanner using multiplanar reconstruction and different 3D rendered real time reconstruction techniques. The day after she referred chest pain. The ECG revealed sinus rhythm at a rate of 85 bpm and an elevated ST in the leads V1-V3. She undergone an urgent coronary angiography, which confirmed the diagnosis done by MSCT, even if the exact anatomic course of the fistula could not be clearly shown by various angiograms. Finally, we performed a percutaneous embolization which stopped the shunt without any complication.

Conclusions: Coronary angiography is the gold standard for the diagnosis of coronary artery disease, but its diagnostic value is limited by its planar imaging nature and the restricted angle of angiographic projection. For complex pathology, as our case, conventional coronary angiography sometimes is inadequate for a clear demonstration of the exact anatomy. MSCT is a non-invasive diagnostic method for the investigation of coronary artery disease which give us high quality cardiac imaging. The 3D reconstruction with viewing at an unlimited angle allows us to demonstrate a lesion, such as a fistula, at its best projection, without subjecting the patient to repeated radiation exposure and an additional contrast load and makes assessment of the size and exact location of the lesion. With the new kind of scanner the radiation dose exposure is very low (Snapshot Pulse). After a systematic literature search, we believe this case represents the first where is been used a 64-slice CT for the detection of this kind of congenital anomaly. With its increasing availability and advances in technology, MSCT could become the gold standard for the investigation of coronary artery anomalies and disease.

CP19

INCIDENCE AND SIGNIFICANCE OF ATRIAL FIBRILLATION FOLLOWING CARDIAC SURGERY

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Objectives: Atrial fibrillation (AF) after cardiac surgery occurs in 30-50% of the patients and represents the most common postoperative arrhythmic complication. The etiology of AF after open-heart surgery has not yet been completely elucidated. The aim of the present study was to evaluate clinical predictors of AF after CABG with cardiopulmonary bypass.

Methods: The study consisted of 363 patients undergoing CABG with cardiopulmonary bypass (aged 65.4±0.95 year old). Patients were monitored for 10 days postoperatively for the development of AF. To establish the predictors for post-operative AF, we performed linear regression analysis.

Results: Hundred and thirtyeight (38%) of the total study population developed AF during the postoperative period. The development of AF was positively correlated with age ($r=0.262$, $P=0.003$), chronic obstructive pulmonary disease ($r=0.323$, $P=0.0001$) and postoperative fever ($r=0.181$, $P=0.084$). Gender, body mass index, cardiopulmonary bypass time and increased cross-clamp time were not predictive for the complication. In multivariate analysis, AF was significantly correlated with age [(SE)=0.14 (0.005), $P=0.019$] and to a lesser degree with obstructive pulmonary disease [(SE)=0.280 (0.148), $P=0.067$].

Conclusions: Postoperative AF remains the most common complication after cardiac surgery. In this study we showed that advanced age and obstructive pulmonary disease are independent risk factors for the development of AF after CABG with cardiopulmonary bypass.

CP20

CARDIAC TUMORS: 10 YEARS EXPERIENCE IN 50 PATIENTS

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Objectives: To determine incidence of cardiac tumors in the period of 10 years in the province of Vojvodina, and to evaluate histologic properties as well as clinical presentation.

Methods: Retrospective study which included 50 patients with cardiac tumors operated in the period of 1997-2007 in Clinic for Cardiovascular Disease in Sremska Kamenica. Data were collected using patients history, laboratory findings and histopathologic findings.

Results: Incidence of cardiac tumors in patients treated in our institution is relatively small, <0.5%. Average age of patients was 53.88 years. Women constituted 74% of the patient group. The most common histological finding was cardiac myxoma (approx. 3/4 originated from left atrium). Eight percent of all cardiac tumors were malignant neoplasms. The most common clinical manifestation included dyspnoea, chest pain, palpitations, syncope. The majority of patients had an abnormal ECG finding. The mean onset of symptoms to surgery time was 11 months.

Conclusions: Cardiac tumors, although relatively uncommon pathology, present an important clinical finding knowing their great systemic embolization capacity. Unrecognized cardiac tumors can cause variety of symptoms and mimic other diseases. If left undiagnosed and untreated they could lead to heart failure and sudden cardiac death.

CP21

LEFT VENTRICLE AND RIGHT ATRIAL MYXOMA - SECOND RECCURENCE 6 YEARS AFTER THE FIRST OPERATION

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Objectives: We report the case of a 23-year-old woman in who recurrent multiple cardiac myxomas were resected first time four years after the initial operation and second time three years after the second operation.

Methods: In February 2000, she was diagnosed and operated for right ventricular myxoma; four years later, a recurrent left atrial myxoma was found and resected; after another three years right atrium and left ventricle myxomas were discovered and resected.

Results: The initial cardiac tumor was successfully resected through a right atrium approach and has been followed-up by ultrasound echocardiography every 6-month after discharge. Four years after, the echocardiography revealed one masse in the left atrium, which was resected using a trans-septal approach. After another three years, the echocardiography revealed once again two masses, this time in the right atrium and left ventricle. The third surgery was performed and all two myxomas were successfully resected through a combined right atrial and left ventricle approach. One year after the third operation, she has been doing well without any sign of recurrence of myxoma.

Conclusions: A long-term follow-up is mandatory in patients after the resection of a cardiac myxoma.

CP22

MACROSCOPIC STUDY OF THE SUBSCAPULAR AND THORACODORSAL ARTERIESP. Djukic¹, G. Teofilovski-Parapid¹, V. Lackovic², P. Djukic³¹Institute of Anatomy, University of Belgrade School of Medicine, Belgrade, Serbia; ²Institute of Histology and Embryology, University of Belgrade School of Medicine, Belgrade, Serbia; ³Institute for Cardiovascular Diseases of the Clinical Center of Serbia, Belgrade, Serbia

Objectives: The aim of the study was gross morphological investigation of the origin and course of the arteries, determination of the number of the conduit branches and measurement of morphological parameters as length and external diameter of the arterial conduits.

Methods: The arteries were taken from 21 cadavers, aged between 41 and 83 years. They were obtained during forensic autopsies. Some parameters, like length, were measured in situ. Number of branches was measured while harvesting the conduit. Proximal and distal external diameter were measured after harvest under pressure. Anatomic variations were searched for during entire process.

Results: Different macroscopic variations of the origin, course or ending of the subscapular-thoracodorsal artery was noticed in 6 out of 21 cadavers (28.57%). Overall, the length of the left subscapular-thoracodorsal conduit was 109.85±31.90 mm, with proximal external diameter of 5.83±0.92 mm and distal external diameter of 2.75±0.48 mm. The length of the right conduit was 105.75±28.28 mm, with proximal external diameter of 5.86±0.92 mm and distal external diameter of 2.89±0.44 mm. On both sides, the average number of lateral branches of the conduit including circumflex scapular artery was six.

Conclusions: Based on the results obtained in this study, from gross morphological aspect, it can be stated that subscapular-thoracodorsal arterial conduit meets the criteria for composite graft in total arterial revascularization of the heart.

CP23

HISTOLOGICAL AND MORPHOMETRIC CHARACTERISTICS OF THE SUBSCAPULAR AND THORACODORSAL ARTERIESP. Djukic¹, M. Labudovic-Borovic², V. Lackovic², G. Teofilovski-Parapid¹¹Institute of Anatomy, University of Belgrade School of Medicine, Belgrade, Serbia; ²Institute of Histology and Embryology, University of Belgrade School of Medicine, Belgrade, Serbia

Objectives: The aim of this study was detailed morphological, histochemical and morphometric investigations of subcapsular artery and its branch, thoracodorsal artery, having in mind their possible joint use as alternative conduit in coronary artery bypass grafting.

Methods: The arteries were obtained during forensic autopsies, from the persons of both sexes, between 41 and 83 years of age. Intimal and medial thickness, thickness of whole arterial wall, luminal diameter, number of elastic lamellae in media, thickness of the internal elastic lamina and number and size of fenestrations of internal elastic lamina were analyzed on proximal, medial and distal segments of arterial graft by means of relevant histochemical and morphometric techniques

Results: Analysis of morphometric parameters of the subcapsular-thoracodorsal arteries showed that they are in correlation with same parameters of other arterial conduits presently used in CABG. Histological results showed that tunica media of all subcapsular artery segments were organized in two morphologically different parts: internal, with 2-3 layers of concentrically oriented smooth muscle cells without differentiated elastic lamellae and the external one, where organized elastic lamellae could be distinguished as well as smooth muscle cells interspersed among them. The number of elastic lamellae varies depending on the arterial segment investigated. The subcapsular artery shows the characteristics of the transitional type of artery where number of the elastic laminae decreases from proximal towards distal segments. On the contrary, the thoracodorsal artery was almost entirely muscular. The presence of atherosclerotic lesions were estimated according to morphological observation, intimal thickness, as well as intima/media ratio.

Conclusions: Further investigation is needed to assess the effect of observed histological difference between the media of subcapsular and the media of thoracodorsal artery on the entire conduit and its behaviour on coronary position. Other results in this study point to conclusion that subcapsular-thoracodorsal arterial conduit is suitable for usage as graft in coronary surgery.

CP24

A SIMPLE METHOD FOR MAKING PHOTOGRAPHIC RECORDS UNDER STERILE CONDITION

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Objectives: Digital photography has become a practical alternative to conventional film photography for medical documentation, communication, and education. The use of digital cameras has become increasingly popular in recent years for documenting perioperative condition, intraoperative finding, and imaging studies. However, taking intraoperative picture or video clips may be technically demanding for assistants or nurses. Herein, we describe a simple and effective method for surgeons to create photographic and video records of operations under sterile conditions involving the use of a digital camera encased in commercially available protective housing.

Methods: During the operation, the protective housing was removed from the aseptic envelop in accordance with standard procedures for re-sterilized equipment (STERRAD 100S system) in operation room. The circulating nurse placed the digital camera (Digimax i5, Samsung) into the sterilized protective housing (Samsung SPH-A3, Samsung), and the scrub nurse locked the housing buckle. The camera was then ready to record digital photographs and video footages in the operating room. The assistance of a professional photographer was not required. Using this particular method the surgeon did not lose valuable intraoperative information through misdirected or in accurate shots.

Results: During first three-months periods this method was used to record a range of operative images that were subsequently transferred to a computer database and the hospital PACS image system. A total of 67 digital images were recorded; of these, 901 were still photographs and 66 were video clips. No procedure-related infection in this particular patient population was noted. These digital images were used for teaching purposes, publication, and patient records.

Conclusions: Using a digital camera encased by sterilized waterproof housing, we were able to take high-quality intraoperative photographs and video clips without assistance, thus precluding the possibility of losing valuable intraoperative information through involvement of an outside party.

CP25

PERCUTANEOUS CATHETER FOR DRAINAGE PERICARDIAL EFFUSIONS AFTER CARDIAC SURGERY - 10 YEARS EXPERIENCE

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Objectives: Pericardial effusion is a common adverse effect after cardiac surgery but usually can be treated conservatively. When the effusion produces low cardiac output symptoms and tamponade draining becomes necessary. The aim of our study was to emphasize the role of percutaneous drainage of these effusions using a three lumen catheter.

Methods: In this study we present our ten years experience in draining pericardial effusions mostly after cardiovascular operations or procedures. The pericardium effusion is diagnosed from a routine thoracic ultrasound after the surgery or after low cardiac output symptoms of the patient. Thirty patients per year usually need draining. We follow the ATLS guidelines for pericardial effusion drainage under the echocardiographic guidance.

Results: The drainage is usually complete in a few hours. The catheter is removed after a negative ultrasound the following day and the patient can exit the clinic. The mortality after the draining was 0%. Only 2% of the patients faced rhythm abnormality and they were cured conservatively and 1% we faced cardiac injury. The recurrence of the pericardial effusion is rare.

Conclusions: Percutaneous placement of a catheter into the pericardial space, under the assistance of an ultrasound, for drainage is a safe method. Furthermore, hospital stays and operative cost are much more less than those after a pericardiostomy.

CP26

A NOVEL ELASTASE INHIBITOR MAY REDUCE SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DURING CARDIOPULMONARY BYPASS

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Objectives: Excessive production of inflammatory cytokine that develop after cardiopulmonary bypass is common and may result in systemic inflammatory response syndrome (SIRS), acute lung injury (ALI) and the acute respiratory distress syndrome (ARDS). One of the mechanism of ALI followed by SIRS results from accumulation of neutrophils in lung induced by inflammatory cytokines and release of neutrophil elastase that causes injury of endothelial cells and epithelium of lung. The use of elastase inhibitor to suppress ALI during cardiopulmonary bypass in clinical trial has been undertaken.

Methods: Twelve consequent patients were performed major thoracic operations including coronary artery bypass grafting and single valve replacement. All the operations were performed by using cardiopulmonary bypass. Patients were divided into three groups ($n=4$ each group). Group I: Sivelestat sodium hydrate was administrated continuously (0.2mg/kg/h) during the operation. Group II: Steroid was administrated at the first of the operation. Group III: patients were not administrated sivelestat sodium hydrate, steroid or any other anti-inflammatory drugs (control). Blood samples were collected at following time points: the start of the operation, before starting cardiopulmonary bypass (CPB), after CPB, after the operation and twenty-four hours after the operation. White blood cell count, Neutrophil elastase, IL-6, ICAM-1, VCAM-1, E-selection, CD11b and TNF-alpha were measured. Postoperative physical data including body temperature (above 38 degree), heart rate (above 90 beats/min) and respiratory rate (20 breath/min) were measured to evaluate whether systemic inflammatory response syndrome occurs or not.

Results: Value of Neutrophil elastase increased after cardiopulmonary bypass and was related to CPB time ($R^2=0.742$). Value of IL-6 was significantly related to CPB time ($R^2=0.912$) in all the groups. Postoperative increasing rate of VCAM and ICAM was suppressed in Group I and II. Duration of SIRS in Group I, II and III were 14.1, 5.7 and 29.5, respectively. Duration of SIRS in Group I is significantly shorter than that of Group III ($P<0.05$). In detail, duration (h) of high body temperature in Group I and II was significantly shorter than that of Group III (11.4, 3.7 and 43.5).

Conclusions: It is obvious that steroid reduces SIRS. Moreover, Sivelestat may also reduce SIRS during cardiopulmonary bypass, especially reduce duration of high temperature, and it may have relation with impairing the rolling of white blood cell.

CP27

IS THERE A DIFFERENCE BETWEEN REPLACEMENT AND REPAIR IN MITRAL VALVE SURGERY FOR ISCHAEMIC REGURGITATION - OUR EXPERIENCE

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Objectives: Mitral incompetence is chronic sequel of myocardial infarction. It is caused by apical displacement and tethering of the mitral valve leaflets after myocardial infarction, resulting in incomplete coaptation. There is a consensus about a need for mitral surgery in the presence of significant ischaemic mitral regurgitation. In early times that was only mitral valve replacement with mechanical or tissue valve. Because of suboptimal results several methods of mitral repair have been developed. Today most commonly used is undersized annuloplasty. There is a lot of doubts weather repair is better than replacement in this group of patients Lots of studies have been performed and there is still no answer.

Methods: This is retrospective non-randomized study of all patients operated for coronary artery disease and ischaemic mitral regurgitation in period between 2000-2006. Surgical method used for mitral valve was surgeons choice. Most commonly used were restrictive annuloplasty and replacement with mechanical prosthesis. For comparison we used standardized statistical methods, χ^2 -test, Fischers exact test, Kaplan-Mayer curve, etc.

Results: In that period we operated on 138 patients. Fifty-two got MVR and 86 MVP. Both groups were comparable by demographic data and risk factors. There was statistically significant difference in NYHA class for two groups. Hospital morbidity and mortality were similar and there was no statistical difference between two groups. Our follow-up was up to 84 months and included 83% of patients. There was significant difference in NYHA class and LVEF between two groups. Mortality rate measured by Kaplan-Mayer method was without statistical difference $P=0.97$.

Conclusions: Correction of chronic ischemic mitral regurgitation through either repair or replacement provides a good mid-term survival rate, with around 75% of the survivors in New York Heart Association classes I and II. This survey couldn't give us an answer what is better for our patients, to repair or to replace. There is a need for prospective randomized study for better comparison of these two groups.

CP28

EARLY AND LATE RESULTS OF TOTAL CORRECTION OF TETRALOGY OF FALLOT

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Objectives: The purpose of this study was to evaluate the early and late outcome after total correction of tetralogy of Fallot.

Methods: Between 1995 and 2006, 101 consecutive patients with a mean age of 8.23 ± 4.90 years (range, 1-25 years) underwent repair of TOF at one institution. Forty-two patients had initial palliative operations. A transannular patch was inserted in 60 (58.5%) patients. Risk factors for operative mortality were analyzed. Follow-up was obtained from clinical appointments and telephone questionnaires.

Results: The operative mortality was 6.9%. Aortic cross-clamp time more than 90 min ($P<0.01$) and cardiopulmonary bypass time more than 120 min ($P<0.01$), affected operative mortality, whereas previous palliative procedure, hematocrit level, and use of transannular patch did not. Mean follow-up is 34.08 ± 31.09 months (range, 1-120 months). Actuarial survival is 91% alive 10 years after total correction. On Postoperative echocardiography, 22 patients had mild pulmonary regurgitation, 19 had a right ventricular outflow tract gradient more than 50 mmHg, and 10 had a small residual ventricular septal defect. There were two late deaths. Late sudden death from cardiac causes occurred in one patients.

Conclusions: Total correction of TOF can have low operative mortality and provide excellent long-term survival. This experience suggests that the key factor in the total correction of TOF is to correct the pathology completely, to protect the myocardium, and to manage the complication properly.

CP29

THE MEDICAL TREATMENT TO PATIENTS WITH END STAGE HEART FAILURE

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Objectives: According to the European Society of Cardiology, 4% of European citizens have a pathological heart failure (HF). When HF is diagnosed, ~50% of all patients die in the first four years, and in the case of end-stage HF, 50% die in the first year. HF is treated medically, with the help of mechanical circulatory support systems and heart transplant (HTx).

Methods: The large number of patients with chronic and acute HF needs for intensive treatment. Gold standard for these patients is HTx. However, this method of treatment is severely limited because of donors' duration. The progress of pharmacotherapy in the last years can help for these patients prolonged them life and benefit quality of life. During 2000-2007 years 173 recipients were on the waiting list for heart transplant. Heart transplant operations were performed 56 heart transplant were performed (32%). On the waiting list there were 117 recipients - 13 female and 104 male. Fourteen of them were diagnosed ischemic cardiomyopathy, 2 - hypertrophic cardiomyopathy, 101 - dilatative cardiomyopathy. The age of recipients varies from 10 to 65 years (average 37.5 years). Left ventricle ejection fraction (LV EF) of all of them was <20%. All of them were treated medically with ACE inhibitors, diuretics, BAB, aldosterone antagonists, glykozides, sometimes medicine with a positive inotropic effect was administered (dopamine, dobutamine, levosimendan). The majority of the patients had the intravenous adrenomimetics therapy, antiarrhythmic drugs. All of them were administered anticoagulants or antiagregants due to the increased risk of thromboembolic complications.

Results: Due to application of medical treatment, 29 patients lived to see the heart transplant (25%), 39 recipients died (33%), 18 patients (15%) were excluded from the recipients list as their LV EF improved significantly. Because of contraindications to heart transplant, four recipients (3%) were excluded from the list. At the moment 27 recipients (24%) are waiting for heart transplant.

Conclusions: 1. When complex heart failure treatment was applied, heart transplant performed to 56 patients (32%).

2. The condition of 16% of recipients improved, which resulted in the fact that they no longer needed heart transplant.

CP30

MITRAL VALVE REPLACEMENT IN A PATIENT WITH IDIOPATHIC HYPEREOSINOPHILIC SYNDROME AND PULMONARY ARTERIAL HYPERTENSION

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Objectives: Idiopathic hypereosinophilic syndrome, a rarely seen systemic disease, may cause cardiac valvular lesions by eosinophilic infiltration. This report describes management of a 25-year-old woman with idiopathic hypereosinophilic syndrome, severe mitral stenosis and pulmonary arterial hypertension.

Methods: The patient presented with haemoptysis and dyspnea on exertion. Echocardiography showed severe mitral stenosis and pulmonary arterial hypertension. She was hospitalized, anticoagulated and received cyto reduction therapy with prednisolon.

Results: After haematological stabilization, she underwent mitral valve replacement using a No. 27 bovine pericardial valve (Edwards Lifesciences, Irvine, CA, USA). In the intensive care unit, she had a pulmonary hypertensive crisis which ameliorated gradually with sedation and continuous intra-pulmonary artery infusion of nitroglycerin. She was extubated and discharged on the second and seventh days, respectively. Histological examination of the excised valve showed calcification and fibrosis of the mitral leaflets and infiltration of the mitral valve by eosinophils. Histological examination showed that the biopsy material from the lung was normal. Biopsy materials from the right atrium and the myocardial tissue adjacent to mitral valve were also normal, thereby endomyocardial fibrosis was excluded.

Conclusions: Surgical experience for the patients with mitral dysfunction caused by idiopathic hypereosinophilic syndrome is limited. When mitral valve replacement is needed, the ideal type of prosthesis remains unclear and the presence of pulmonary arterial hypertension further complicate the management. Bioprosthetic valves would be the appropriate choice in eosinophilic mitral dysfunction requiring valve replacement. Furthermore, in the presence of preoperative pulmonary arterial hypertension, adequate precautions should be taken against pulmonary hypertensive crisis in the early postoperative period.

CP31

SAFETY AND EFFECTIVENESS OF IRRIGATION WITH 1.5% HYDROGEN PEROXIDE SOLUTION OF THE INFECTED AREA FOR ACTIVE INFECTIVE ENDOCARDITIS

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Objectives: A solution of 3% hydrogen peroxide is one of the most widely used antiseptics to decrease bacterial colonization. Intensive irrigation with polyvidone-iodine solution after intensive debridement of the infected area is widely used as surgical strategy for active infective endocarditis. In this paper, instead of irrigation with polyvidone-iodine solution we investigated safety and effectiveness of irrigation with 1.5% hydrogen peroxide solution of the infected area for active infective endocarditis.

Methods: In 2003, after intensive debridement of the infected area we started to use irrigation with 200 ml of 1.5% hydrogen peroxide solution followed by irrigation with 3 l of saline solution of the infected area in all patients presenting with active infective endocarditis. We used 1.5% hydrogen peroxide solution, but not 3%, considering tissue damage. Since March 2003, 17 consecutive patients (9 men, 8 women, mean age 59.7 years, range 26-82 years) with active infective endocarditis underwent surgical treatment at our institution. There were 11 (64.7%) cases of native (6 mitral, 1 aortic, 1 both aortic and mitral, and 3 tricuspid valve) and 6 (35.3%) of prosthetic valve endocarditis (4 aortic and 2 mitral prosthetic valve). Mitral valve repair was performed in five patients, tricuspid valve repair in two patients, and valve replacement in ten patients (mechanical prosthesis in nine, biological prosthesis in 1). Intraoperatively patients showed abscess formation in the aortic ($n=3$) and mitral ($n=1$) position. Blood cultures revealed Streptococci ($n=9$), Staphylococci ($n=6$, including MRSA in two patients).

Results: There were no hospital deaths. Any complications related to hydrogen peroxide did not occurred. Late mortality was 5.9% ($n=1$, sudden death). At the latest follow-up (100% complete; mean, 20.0 ± 15.6 months), no patients had recurrence of endocarditis and reoperation. Postoperative NYHA classification improved in all patients from preoperative NYHA 3.0 ± 0.7 to NYHA 1.1 ± 0.3 .

Conclusions: In this paper, we showed safety and efficacy of irrigation with 1.5% hydrogen peroxide solution of the infected area for active infective endocarditis. The major limitation of this series is its small size and the relatively short follow-up.

CP32

THROMBOTIC OBSTRUCTION OF A MECHANICAL PROSTHETIC VALVE IN TRICUSPID POSITION

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Objectives: Prosthetic valve thrombosis is a rare but serious complication of valve replacement. Contrary to the florid appearance of left-side heart failure in patients with stuck left-side valves, sign of right heart failure associated with stuck tricuspid valve may be quite subtle. We describe a patient who presented with large thrombus in the tricuspid prosthetic valve leading to obstruction and received a prosthetic valve replacement successfully.

Methods: A 43-year-old female was admitted because of progressive exertional dyspnea and abdominal distension over several weeks. The patient had a history of rheumatic heart disease, hyperlipidemia, and gouty arthritis. Mechanical mitral and tricuspid valve were implanted 1.2 years ago (St. Jude, 29 mm, 33 mm, respectively). She was not regularly follow-up at our hospital, and prescribed warfarin at a local hospital. Her international normalized ratio (INR) on admission was 3.28. Transthoracic echocardiography showed possible tricuspid prosthesis dysfunction, and fluoroscopy confirmed both leaflets involved in semiopen position. During operation, the thrombus was removed totally, and the bi-leaflets of the prosthesis, placed with the hinge antianatomically, were found stuck in semiopen position. The explanted prosthesis showed organized thrombus involving both leaflets on the ventricular site. The prosthesis was excised and replaced a new mechanical one.

Results: The postoperative course was uneventfully and she was discharged on the 7th postoperative day with INR 2.8.

Conclusions: Because valve implantation in the tricuspid position makes up <2% of all mechanical valve implantation, experience with tricuspid valve thrombosis is limited. The risk of mechanical valve thrombosis in the tricuspid position is unacceptable high (annual rate of 4%) due to lower flow rate through right sided chamber. Contrary to the florid appearance of left-side heart failure in patients with stuck left side valve, sign of right heart failure associated with stuck tricuspid valve may be subtle. Thrombolysis is effective for all valve positions, and this approach seems particularly effective for prostheses in the tricuspid valve. But patients who have a large clot, those with evidence of valve obstruction should under immediately reoperation, as in our patient, to avoid catastrophic complication.

CP33

MEDICAL TREATMENT PROTOCOL BEFORE AND AFTER OPERATION IN BRUCELLA ENDOCARDITIS

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Objectives: Brucella microorganism, which is adapted to the intracellular course, shows resistance to medication and shows recurrence that is actually not low. The most effective option is antibiotics and surgery combination.

Methods: Between September 2001 and September 2007, ten patients were hospitalized at different times in our clinic. All patients were observed by the departments of Infectious Diseases, Cardiology and Cardiovascular Surgery. All patients had a triple combined antibiotherapy regimen (doxycycline 200 mg/d, rifampicin 600 mg/d and ceftriaxone 2 g/d).

Results: Patients were taken to cardiac operation without any delay as the fever and the other symptoms disappeared. The patients were discharged with doxycycline 200 mg/d and rifampin 600 mg/d. They were observed weekly in the first month and monthly in the following six months period by the outpatient clinics of the Departments of Infectious Diseases and Cardiovascular Surgery. In every monthly visit Brucella agglutination tests were examined. Double antibiotherapy were discontinued when it was decided that the infection is already eradicated, which is based on the decrease in agglutination titers and clinical evaluation of patients. Our patients continued the postoperative double antibiotherapy for a mean of 4 months (range, 2-6 months).

Conclusions: Brucella endocarditis does not show remission and has a high mortality if not treated. Control of the infection with preoperative antibiotherapy and immediate surgery after improvement of the clinical status of the patient have gratifying outcomes. Continuation of postoperative antibiotherapy according to clinical evaluation is necessary for a successful radical therapy and long-term quality of life.

CP34

LOCAL CEFALOSPORIN ANTIBIOTIC COVERAGE OF PROSTHETIC CARDIAC VALVES IN SURGICAL TREATMENT OF INFECTIOUS ENDOCARDITIS

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Objectives: Improvement of the results of surgical treatment of patients with active forms of infectious endocarditis.

Methods: To evaluate the method of antibacterial protection of an artificial prosthetic cardiac valve cuff with the use of cephalosporin antibiotics, we conducted a clinical trial. In our previous research, it was shown that the solubility of the resulting complex salt is 1235 times less than the solubility of native cefasolin. In the course of clinical trial we, preoperatively, after the stitching of the valve cuff with the fixative ligature, sequentially pierced the cuff around the periphery with a fine injection needle, impregnating it with the solutions of methylene blue, cephalosporin antibiotic (cefasolin or cefepaserone), then methylene blue. Antibacterial treatment of the valve prosthesis continued for 3-4 min. In the course of the experiment it was proved that complex compound of cephasolin and methylene blue preserves antibacterial activity on surgical materials for up to 11 days in subcutaneous implantation. This technique of the antibacterial coverage of prosthetic valve cuff has been conducted in the course of surgical treatment of 79 patients with infectious endocarditis. The control set was formed by 73 patients who had a prosthetic valve implanted without antibacterial impregnation. The control and experimental sets were virtually identical in terms of age, initial state, aetiology, duration and variant of clinical course, and also in terms of surgical treatment.

Results: The patients of the experimental set exhibited a more stable postoperative course, and no cases of reinfection have been registered during earlier and late medical supervision within five years. This confirms high efficiency of antibacterial prosthetic valves in comparison with regular mechanical prosthetic devices in surgical treatment of infectious endocarditis. The control set displayed the development of early prosthetic endocarditis in three cases (4.1%). Two of the patients (2.7%) from the control set had a repeated surgical treatment concerning hemodynamically significant paraprosthetic fistulae. Two (2.7%) patients from the control set displayed late prosthetic endocarditis development. The relapse emerged in seven months and ten years after the operation, respectively. Hospital lethality among the patients of the control set was 66.7% in case of early prosthetic endocarditis, and 50% in case of late.

Conclusions: The application of marginally soluble form of cephalosporin antibiotics to provide antibacterial protection of implanted prosthetic cardiac valve cuffs is a highly effective approach to surgical treatment of infectious endocarditis. This greatly reduces the risk of prosthetic endocarditis development.

CP35

TRANSESOPHAGEAL ECHOCARDIOGRAPHY FOR MONITORING LEFT VENTRICULAR OUTFLOW TRACT DURING BEATING HEART SURGERY: HEMODYNAMIC IMPLICATIONS

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Objectives: Transesophageal echocardiography has been a routine part of our intraoperative management on all our cardiac cases since 2001. The utility of TEE for off-pump (OPCAB) or beating heart on pump (BHOP) has been poorly detailed. We report the utility and optimal visual views of intraoperative TEE for beating heart procedures.

Methods: Hemodynamic monitoring consisted of continuous arterial, CO, PAP and MVO₂ (Swan-ganz), and transesophageal echocardiography (TEE). For TEE, a standard mid-esophageal view at 120 degree is incorporated. Visualization is maintained during cardiac manipulation, and grafting sequence to the anterior, lateral, or inferior walls. During manipulation, CO, PAP and MVO₂ measurements were correlated to whether the left ventricular outflow tract (LVOT) was being compromised during cardiac manipulation. This report depicts one case out of >600 consecutive cases.

Results: A patient had OPCABX3 with a LIMA-LAD/endarterectomy, SVG-ramus, and SVG-PDA utilizing a coronary stabilizer and apical cardiac positioner. TEE during cardiac positioning is able to demonstrate LV and RV function, septal wall shift, compression and/or obstruction of the LV outflow tract, and development of mitral regurgitation. These assessments can help the cardiac

surgeon optimize heart position and restore normal conformation to perform complex coronary revascularization, and predicts prior to direct visualization, or change in PAP, CO, or MVO₂ that hemodynamic instability may ensue.

Conclusions: Intraoperative transesophageal echocardiography (TEE) has proved extremely useful in aiding the cardiac anesthesiologist and cardiac surgeon in maintaining optimal hemodynamic stability and myocardial perfusion during beating heart surgery techniques. Moreover, regional wall motion improvements can uniformly be detected after revascularization, especially patients being operated on with ischemic cardiomyopathy or acute coronary syndromes.

CP36

THE PREDICTORS OF THE SALINE IRRIGATED RADIOFREQUENCY ABLATION TREATMENT SUCCESS RATES FOR THE ATRIAL FIBRILLATION

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Objectives: The purpose of our study is to find out the risk factors influencing the success rate of SIRFA at the end of one-year period.

Methods: Between October 2002 and June 2006, 210 patients with AF selected for rheumatic mitral valve surgery have undergone SIRFA with an available unipolar probe. Each patient had a 12-lead electrocardiogram (ECG) and 24 h holter monitorization was done for routine control at the end of one year.

Results: While the incidence of early postoperative AF was found to be 17.61% (37), this ratio was 14.75% (31) at the first month and 15.7% (33) at the sixth month after surgery, and 16.2% (34) at the end of one year. The univariate analyses have revealed that, patients older than 60-year-old, the presence of chronic AF, patients with AF for more than six months, left atrium diameter >60 mm, left atrium diameter >60 mm after left atrium diameter reducing procedure, postoperative antiarrhythmic treatment requirement and patients undergoing temporary epicardial pacemaker implantation at the end of surgery are significant risk factors. Multivariate analyses have revealed that, patients older than 60-years-old, patients with left atrium diameter >60 mm, with left atrium diameter >60 mm after left atrium diameter reducing procedure, and with postoperative antiarrhythmic treatment requirement are under significant risk.

Conclusions: In our study, left atrium diameter >60 mm before or after surgery, age older than 60 years, and antiarrhythmic drug requirement in the postoperative period have been established as the main predicting factors unfavorably influencing the success of SIRFA.

CP37

REDUCTION OF GIANT LEFT ATRIUM IN PATIENT WITH MITRAL VALVE DISEASE

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Objectives: Assess immediate post-surgical results of surgical reduction of giant left atrium in patient with mitral valve disease.

Methods: Sixty-eight patients have been operated with giant left atrium from October 2006 to January 2008. There were 40 females (65%), 22 males (35%). Mean age was 52±8 years. Volume of left atrium before operation was 355±107 ml. Atrial fibrillation was in 60 patients (97%), stenosis of mitral valve in 20 patients (33%), stenosis and insufficiency in 6 (9.8%), insufficiency - 9 (14.5%) patients. Mean LV EF was 51±3%. High pulmonary hypertension was in 29 (47%) patients. Concomitant aortic valve disease was 4, tricuspid valve disease was in 12. Ten patients had thrombus of left atrium. There were 43 patients (70%) with III grade, 9 (14.5%) with IV (NYHA). The etiology was: rheumatism 55 (89%), disease of connective tissue - 7 (11%). Operative techniques - tissue redundancy circular resection by cutting off right pulmonary veins in 24 (39%), wedge resection between right and left pulmonary veins in 37 (59.4%). One (1.6%) patient underwent heart autotransplantation. Concomitant aortic valve replacement - 4 patients (MedIng-2), mitral valve prosthesis - 58 patients (MedIng-2), in 3 - plasty of mitral valve, plasty of tricuspid valve - 15 patients. CPB was performed according to the scheme aorta - superior and inferior vena cava, cardioplegia by Custodiol. Mean time of myocardial ischemia 71±24 min (41-186). Mean time of CPB was 92±28 min (61-262).

Results: Mortality rate was nil. Volume of left atrium after operation was 184±41 ml.

Conclusions: The used methods decrease noticeably the volume of left atrium in our experience. It has a low complication rate. These methods are simple in technical performance.

CP38

PULMONARY VEIN ANEURYSM DUE TO MITRAL REGURGITATION

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Objectives: In patients with severe mitral regurgitation, pulmonary vein aneurysm can be seen. Mitral valve replacement may help regression in aneurysm. We present a case with severe mitral regurgitation and pulmonary vein aneurysm.

Methods: Nineteen years old female patient with complaints of chest pain and fatigue was diagnosed as severe mitral regurgitation and pulmonary hypertension. Thorax CT was taken to evaluate the mediastinal mass seen on routine chest X-ray. The pulmonary vein aneurysm was diagnosed. Mitral valve replacement was conducted on the patient. The aneurysm was untouched and left for regression. After six months, thorax CT taken and it showed a progressive regression in the pulmonary vein aneurysm.

Results: Six months later, there was no residual mitral insufficiency and the aneurysm was completely disappeared. The patient was free of symptoms.

Conclusions: True aneurysm of the pulmonary vein is a rare lesion and may present as a mediastinal mass. There are two ways which pulmonary vein aneurysm can occur. One is due to mitral insufficiency. The second is a congenital. Symptoms are not obvious. Diagnosis of pulmonary vein aneurysm is done by inter-operative transoesophageal echocardiography and thorax CT. Presence of this lesion in this patient with cardiomyopathy may require a modification of surgical technique at cardiac transplantation or surgical resection of an aneurysm without cardiopulmonary bypass. The pulmonary aneurysm caused by mitral regurgitation can be treated by mitral valve replacement.

CP39

DIFFERENT TECHNIQUES FOR AORTIC ARCH AND SUPRAAORTIC BRANCH ANEURYSM REPAIR

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Objectives: The aim of study was to analyze the outcome and approach.

Methods: Seventeen patients, age range from 2 to 72, underwent surgical (15) and two - stent - prosthesis implantation for: A-V aneurysm aortic arch-left brachiocephalic vein (2), left subclavian artery - brachiocephalic vein (1), vertebral artery - jugular vein (1); tr.brachiocephalicus (1) aortic arch (2), subclavian artery (6), common carotid (4). Three patients have severe and one moderate heart failure, three patients have inflammation aneurysms with positive bacteriology. Nine aneurysms located intra-, and eight - extrathoracally. Diagnostic procedures: CT, CT angiography, subtraction angiography, MRA. Surgical managements: aneurysm resection followed by graft interposition, A-V fistulae closure. Two patients was required of cardiopulmonary bypass. Two large, partially thrombosed aneurysms (subclavian, aortic arch) was successfully corrected by implantation of stent-graft.

Results: There were one death from cerebral and infection complications. Morbidity - one renal acute insufficiency, required successfully hemodialize treatment.

Conclusions: Median sternotomy is the most common approach for aortic arch, innominate and large subclavian artery aneurysms, especially with A-V communication. Gigantic subclavian artery aneurysms better corrected thorough a thoracotomy and supraclavicular combined approach. Stent-graft implantation indicated for small or complicated aneurysms.

CP40

VAC THERAPY AND PLATE FIXATION SYSTEM FOR COMPLICATED STERNAL WOUND INFECTION: A NEW STERNAL-SPARING TECHNIQUE

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Objectives: Conventional surgical treatments of deep sternal wound infection has an increased morbidity and mortality, due to the lost of the whole sternum and the use of different techniques with pectorals major flap. We report the preservation of the sternum and its rigid fixation with plates, after an inicial treatment with vacuum assisted closure (VAC©) therapy.

Methods: During 2007, two patients with mediastinitis had restoration of sternal integrity with a new internal rigid fixation system using titanium

reconstruction plates. As soon as deep sternal wound infection was diagnosed clinically, the wound was explored, the sternal wires removed and vacuum assisted therapy was initiated until C-reactive protein level were <70 mg/l. Then, after debridement of devitalized bone, a new titanium osteosynthesis system with restoration of sternal integrity was implanted, combined with simple bilateral mayor muscle flaps to close the wound. Three transverse plates were implanted in both patients, and another manubrium plates in one of them.

Results: The procedures were successfully performed and the sternum could be preserved in both cases. The short-term follow-up showed stable sternal conditions after plate installation.

Conclusions: This new sternal fixation technique is safe and easy to handle, without thoracic instability and broadens the spectrum for closure of complicated sternal wound infections.

CP41

NEOANGIOGENESIS AND MYOCARDIAL REGENERATION WITH TRANSEPICARDIAL BONE MARROW STEM CELL IMPLANTATION

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Objectives: Efficiency of transepicardial bone marrow stem cell implantation in generating neoangiogenesis and myocardial regeneration is investigated in a patient with severe coronary artery disease inappropriate for either surgical or interventional revascularization.

Methods: Sixty-five year old patient with two vessels coronary artery disease was accepted as inappropriate for either surgical or interventional revascularization due to total occlusion in left anterior descending coronary artery with inadequate distal filling and 95% stenosis in a rudimentary right coronary artery. Echocardiography revealed a low ejection fraction as 34% and akinesia or hypokinesia in regional wall motions concordant with ischemic areas. 99mTc-MIBI scintigraphy revealed aperfusion or hypoperfusion in ischemic areas. Autologous bone marrow mononuclear stem cell suspension was prepared for injection. At operation, stem cell suspension is injected to the preoperatively determined ischemic areas and around the distal LAD, transepicardially. Efficiency of the procedure, regarding the generation of neoangiogenesis and myocardial regeneration is evaluated with comparisons of the results of echocardiography (performed preoperatively and at 7th day, 3rd month, 12th month), 99mTc-MIBI myocardial perfusion scintigraphy (performed preoperatively and at 3rd and 12th month) and coronary angiography (performed preoperatively and at 12th month).

Results: While postoperative echocardiography at the 7th postoperative day revealed no significant changes in terms of ejection fraction and regional wall motion, echocardiographies performed at the 3rd and 12th month demonstrated a significant improvement in global ejection fraction (37% at the 3rd and 40% at the 12th month) and dramatic improvement in regional wall motion of the ischemic areas (several areas of akinesia returned to mild hypokinesia and several others with severe hypokinesia returned to normokinesia). Although, 99mTc-MIBI myocardial perfusion scintigraphy at the 3rd month revealed mild improvement in perfusion of the lateral segments, at 12th month a significant increase in perfusion of the anterior and lateral segments was observed. These regions were preoperatively determined ischemic areas and were considered as areas of aperfusion or hypoperfusion. Coronary angiography performed at postoperative 12th month demonstrated newly developed widespread collateral arteries in preoperatively ischemic areas that were the areas of bone marrow stem cell implantation.

Conclusions: This study demonstrates that implantation of bone marrow stem cells in ischemic areas of myocardium resulted in development of new collateral arteries, increase in myocardial perfusion and improvement in regional wall motion. We conclude that transepicardial implantation of bone marrow stem cells might be an alternative choice of treatment in patients with ischemic heart disease inappropriate for surgical or interventional revascularization.

CP42

NEW LYOPHILIZED BIOPROSTHESIS FOR EXPERIMENTAL ASD CLOSURE

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Objectives: Direct closure, the use of a bioprosthesis or sintetic patch are commonly used for ASD treatment. The search for a biological patch, easy to handle, easy to preserve and to store as well as inexpensive, would be very important for developing countries. The aim of this work was to study a new lyophilized glutaraldehyde treated bovine pericardium patch for experimental ASD closure.

Methods: Twelve dogs were operated on as follows: on the fossa ovalis a 3 cm diameter ASD was created surgically under cardiopulmonary bypass, closed with: Group I ($n=6$) lyophilized glutaraldehyde treated bovine pericardium patch (LGTBPP), or Group II ($n=6$) with Dacron patch, with 4-0 running prolene (both groups). They were evaluated clinically as follows: daily during the first postoperative week and every week through the next six postoperative months. Ecocardiography was performed before euthanasia; Finally, they were evaluated macroscopic and microscopically. Statistical analysis: ANOVA and χ^2 ($P<0.05$).

Results: All the animals survived the surgical procedure and study time. Clinically all the animals presented normal physical activity and no cardiac murmur. Ecocardiography evaluation: all the animals showed normal cardiac contractility, no shunt, no patch dehiscence, no residual defect, no thrombus formation. Macroscopic evaluation: all LGTBPP treated animals showed good integration to the atrial wall, covered by endothelium and no thrombus formation. Microscopic evaluation showed partial bioprosthesis calcification and two dogs presented mild inflammatory reaction. Statistical analysis between group 1 and group 2 was not statistically significant.

Conclusions: The new LGTBPP bioprosthesis is useful for ASD closure, it is very easy to produce, to handle, to preserve and to store. It is inexpensive which is very important for developing countries, and It could be used in other cardiac or cardiovascular diseases.

CP43

TRICUSPID VALVE REPAIR WITH COSGROVE RING IN AGED PATIENTS RECEIVING COMPLEX PROCEDURES IS ASSOCIATED TO A SIGNIFICANT FUNCTIONAL CLASS IMPROVEMENT

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Objectives: Many surgical institutions observed an improved functional class of patients (pts) receiving tricuspid valve repair (TVR). However, the role of TVR in aged patients receiving complex concomitant and/or ReDo procedures is lacking.

Methods: Between April 2002 and March 2007, 61 TVR were performed at our institution. Males to females ratio was 19/41. Mean age at operation was 70.45 ± 13.14 years. Mean NYHA class and EF before intervention were 2.55 ± 0.81 and $53.68\pm 11.44\%$, respectively. Redo surgery represented 31.15% (19) of patients. In 10 patients (16.39%) and in 55 patients (90.16%) an aortic valve replacement and a mitral valve procedure were associated, respectively. Fourteen patients (22.95%) received concomitant CABG. In 57 patients (93.44%) a simple anuloplasty was performed; complex tricuspid repairs with or without anuloplasty represented 2/61 (3.28%) of all procedures each. Almost all patients (57/61; 93.44%) received a Cosgrove flexible ring, whose diameter ranged from 28 to 32 mm (mean 31.11 ± 1.09). Mean CPB time was 122.75 ± 53.50 min; mean aortic cross clamp time was 83.71 ± 32.49 min.

Results: A reoperation for bleeding was necessary in 4/61 (6.56%) patients. Eight patients (13.33%) died during hospitalisation; all but one deaths were cardiac-related. All patients but one of remaining were alive at PO day 90. Among remaining 52 patients, one was readmitted for atrial fibrillation and one was reoperated for endocarditis. At 90 days follow-up visit, mean NYHA class was 1.42 ± 0.50 ; t -test showed a significant difference between preoperative and postoperative NYHA ($P<0.001$).

Conclusions: In our practice, TVR was associated with a consistent mortality and usually it was a part of a complex procedure in a female, low EF and aged patient; functional class appears improved after TVR. However, more research is needed to identify TVR as an independent factor of functional class amelioration in complex procedures.

CP44

ROLE OF SIDENAFIL IN MANAGEMENT OF PULMONARY HYPERTENSION DURING AND AFTER MITRAL VALVE REPLACEMENT

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Objectives: Long standing rheumatic mitral valve disease usually complicated by pulmonary caval venous hypertension (PH) and varying degree

of tricuspid regurge. Cardiopulmonary bypasses (CPB) during mitral valve replacement (MRV) produce hyperactive spasm of pulmonary vasculature, that increase systolic pulmonary artery pressure (SPAP) by 40%. This sudden raise of SPAP lead to acute right ventricular failure with difficult weaning from CPB and high operative and postoperative mortality and morbidity.

Aim of the study: The study was performed to evaluate the effect of operative and postoperative management of PH by sildenafil in MVR.

Methods: Thirty patients had rheumatic mitral valve disease (19 female and 11 male), with mean age 39, 6 ± 13.4 years. All patients had AF and 17 patients were in class III in NYHA classification and 13 in class IV. Also they had sever PH with average SPAP 89.3 mmHg ranged from 70 to 130 mmHg.

Oral sildinafil dose was given just before induction of anesthesia and the second dose was given through nasogastric tube 4 h later. Also in the first month postoperative, sildenafil was given by the same dose three time/day. The dose of sildenafil was adjusted from 0.5 to 2 mg/kg according to the severity of preoperative PH.

Results: There was no operative mortality and one patient was died one week postoperative. At the end of operation the average SPAP was reduced 38% from 89.3 to 55.4 mmHg ($P<0.001$). After one month postoperative the average reduction of SPAP was 67%, from 89.3 to 30 mmHg.

Conclusions: Sildenafil is a marvelous option for management PH during and after MVR.

CP45

APROTININ REEXPOSURE: RISK OF ANAPHYLACTIC REACTION STARTS IMMEDIATELY AFTER FIRST EXPOSURE

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Objectives: Background: The incidence of anaphylactic reaction (AR) to aprotinin is rising and the final decision of uspension is still pending. The risk of AR to aprotinin after reexposure is time dependent. Most reported AR occurred between 2 and 12 weeks after first exposure. Previous studies examined the immunological response within focus on the first six months; however, no study has been focused on antibody formation within the first week. The aim of this study was to investigate aprotinin specific antibody formation - a major risk factor for AR - during the first eight days post exposure.

Methods: One hundred and ninety adult patients undergoing surgery for acquired heart disease were studied pre- and post-operatively. Fifteen patients underwent reoperation. All patients received aprotinin intraoperatively. Serum samples were taken preoperatively, 2, 4, 6, 8 and 40 days postoperatively and tested for aprotinin specific IgG antibodies (ELISA).

Results: Twelve patients were positive for aprotinin specific antibodies preoperatively. Two of them had no documented previous aprotinin contact. No AR to aprotinin occurred intraoperatively. Among the 178 patients without preoperative antibodies, four were positive after 2 and four days, 11 patents after 6, 16 patients after 8, and 77 patients after 40 days.

Conclusions: Although there are no reported AR to aprotinin within the first week after first exposure the presence of specific antibodies is considered as the major risk factor for AR. We could demonstrate that antibody formation starts immediately after aprotinin exposure. The reuse of aprotinin within 12 months is contraindicated. Individual indications for the early reuse of aprotinin requires a careful risk/benefit assessment.

CP46

SAFE AND COST-EFFECTIVE USE OF QUIXIL, A NEW HUMAN SURGICAL SEALANT, IN CARDIAC SURGERY

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Objectives: Quixil™ is a human surgical sealant without any bovine sourced proteins recently introduced to facilitate surgical hemostasis and reduce operative and postoperative bleeding. Preparation of Quixil is very easy and quick and it can be then either gently applied with a syringe either sprayed onto the surface depending on the action needed. Its clinical efficacy has been initially proved in several surgical speciality (mainly orthopaedic and liver surgery) and more recently even in vascular surgery. No data are available so far regarding Quixil utilization in Cardiac Surgery. Since January 2007, we have used routinely Quixil at our department and here we present our preliminary observations.

Methods: Quixil has been used in 67 patients undergoing cardiac surgical procedures. In the majority of patients (46 patients, 68%) it has been used as

routine application following aortic valve replacement (31 patients) or other valve surgery procedure to prevent postoperative bleeding. In 21 patients (32%), has been used in case of active bleeding to facilitate hemostasis.

Results: In all 46 patients receiving Quixil application routinely to prevent postoperative bleeding one single application of 2 ml preparation of Quixil was sufficient to achieve complete hemostasis without any further utilization of different products. Only one out of these 45 patients (1.5%) underwent revision for bleeding and the source of bleeding was not related to the area of application of Quixil. In the subgroup of patients undergoing AVR (31 patients) the amount of postoperative transfusions of blood products was significantly reduced compared to a similar group of patient undergoing AVR in the same period and not receiving routinely Quixil application (0.4 ± 0.3 and 0.8 ± 0.4 units, respectively, $P < 0.05$). In all 21 patients receiving Quixil to facilitate hemostasis in case of active and diffuse bleeding (including 3 cases of revision for bleeding), more than one single application was needed (mean 2.8 ± 0.9) and in 15 patients the combined use of other products was needed.

Conclusions: Quixil application in cardiac surgery seems safe, useful and cost-effective. From our preliminary experience routinely application in valve surgery, especially AVR and root procedure, seems to reduce postoperative bleeding and need for blood transfusion, and has been therefore, become our standard practice. As far as the use of Quixil in case of diffuse postoperative bleeding, it also seem to enhance hemostasis especially in appropriate combination to others products.

CP47

RISK FACTORS OF RED CELL TRANSFUSION IN ISOLATE OFF PUMP CORONARY ARTERY BYPASS

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Objectives: As autologous red blood cell transfusion has been associated with an increase in early morbidity and reduced long-term survival, so the cardiac surgery without transfusion is increasingly important. Off-pump coronary artery bypass surgery (OPCAB) is the one of proper operation to reduce the transfusion. We evaluate transfusion trigger factors and how to reduce autologous transfusion in OPCAB.

Methods: We retrospectively analysed 113 patients (M:F=35:78, Mean age 66.7 ± 9.9) underwent isolated OPCAB, between March 2006 and September 2007. When the level of hemoglobin was below 8.5 gm/dl, we decided to start transfusion in intra and post operation. In only case of the bleeding tendency, we used the platelet and fresh frozen plasma. Preoperatively, 103 patients (91.1%) had taken aspirin and 35 patients (30.9%) had taken clopidogrel. Ninety-nine patients (87.6%) used the both thoracic artery grafts.

Results: There was no autologous transfusion in 48 patients (42.5%), we transfused the 2.2 ± 3.2 unit red blood cell (median 2.0 unit) on average in 65 patients (57.5%) and only 18 patients (15.9%) used the platelet and fresh frozen plasma. Intra operation transfusion was only 26 patients (23.0%) but, 55 patients (48.7%) needed a transfusion, during post operation care. Between transfusion and non-transfusion group, there was no difference in mortality, neurological problem, arrhythmia, re-operation rate ($P > 0.05$) but, total complication, ventilator care time, ICU stay and admission duration, were significantly difference ($P < 0.05$). Time passes, post operation hematocrit increased rapidly. ($P = 0.00$). It increased from $30.7 \pm 4.0\%$ to $35.4 \pm 4.2\%$ during immediate post operation and first out patients department visiting We analyzed the multivariate transfusion trigger factors. In patients factors, medication of clopidogrel ($P = 0.00$, OR=5.61) and pre operate low hematocrit ($< 37.5\%$ $P = 0.03$, OR=28.12) were important trigger factors. In operation factors, graft harvesting time (> 75 min $P = 0.01$, OR=6.40) and total operation time (> 3.5 h, $P = 0.05$, OR=6.10) were important transfusion trigger factors. But, aspirin medication, acute coronary syndrome, graft number, graft type and distal anastomosis number did not increase the autologous transfusion ($P > 0.05$).

Conclusions: As we applied the proper transfusion guide line (Hb=8.5 gm/dl), we effectively reduced the autologous transfusion. And if we consider the patients and specially surgical trigger factors, we can reduce the autologous transfusion without complication.

CP48

ISOLATED MITRAL VALVE DISEASE COMPLICATED MASSIVE THROMBOSES OF LEFT ATRIUM

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Objectives: To analyze main problems in surgery of mitral valve diseases (MVD) complicated by left atrium's massive thromboses (LAMT) (thromboses more than 1/3 of left atrium's volume).

Methods: Two hundred and twenty-seven adult patients (pts) with MVD complicated LAMT were consecutive operated from January 1, 1984 till January 1, 2008 years in Institute. Predominant genesis of MVD was rheumatism. Mitral stenoses was marked in all patients and all of them were in IV NYHA class. There were male 117 (51.9%) and females 110 (48.1%). The average age was 51.2 ± 7.2 (19-69) yy. Calcification of MV was in 147 (70.3%) patients. Previous closed mitral commissurotomy (CMC) was marked in 42 (17.5%) patients. Previous episodes of emboli were in 48 (21.8%) patients. The following procedures were performed: mitral valve replacement (MVR) ($n=160$), MVR + plastic procedure on TV by De Vega ($n=31$), OMC ($n=29$), OMC + plastic procedure on TV ($n=7$). Only mechanical valves were used: in the most of patients- monodisc, bileaflet were only last six years. All operations were performed with CPB, moderate hypothermia ($27-34$ °C) using St. Thomas crystalloid cardioplegia.

Results: The hospital mortality (HM) at the period (1994-2007 years) was 3.6% ($n=5/128$) for MVR (including TV's correction) and 0% ($n=0/25$) for OMC. The reasons of deaths were: heart failure ($n=2$), brain damage (thromemboli) ($n=2$), bleeding (traumatic rupture of LA's posterior wall during removing of LAMT) ($n=1$). In all group ($n=227$) traumatic rupture of LA's wall during radical removing of LAMT was marked in 4 (1.4%) patients. Thrombotic events were marked in 5.6% ($n=12/191$) during MVR and 2.9% ($n=1/36$) during OMC ($P < 0.05$). The value of HM depends of following factors: small LV's volume - ESVI < 15 ml/m.q., systolic pressure in pulmonary artery > 90 mmHg, previous CMC, giant LA, calcification of MV+3. At the remote period (average 14.2±3.8 years) mortality in three time and thrombotic lethal events in two times were higher for MVR's group ($n=91$ patients) than in OMC's group ($n=25$ patients) ($P < 0.05$).

Conclusions: Treatment of MVD with LAMT should be better perform without MVR as soon as possible. Thrombotic events at postoperative period is specific complicated factor for this pathology.

CP49

RETROGRADE CARDIOPLEGIA FOR ISOLATED MITRAL VALVE REPLACEMENT

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Objectives: To present analysis of retrograde cardioplegia during isolated mitral valve replacement (MVR).

Methods: During 2000-2007 years 1574 patients (pts) with pathology of mitral valve (MV) were operated in Institute. There were 579 (36.8%) males, 995 (63.2%) females. Patients' age was 18-73 years (mean 54.8 ± 12.6 years). NYHA class in all group were followings: II class 21 (1.3%), III class 397 (25.2%), IV class 1156 (73.5%) patients. The reasons of MV were: rheumatism, lipoidoses, atherosclerosis and others. Following methods of surgical treatment were used: MVR ($n=1251$), MVR + correction of tricuspid valve ($n=323$). Concomitant CABG was performed in 57 (3.6%) patients. Two hundred and forty-five (15.6%) operations were performed after previous closed mitral commissurotomy. Systemic hypothermia $27-34$ °C, CPB, St. Thomas cardioplegic solution were occurred in all patients. In 1254 cases myocardial protection was achieved with the use of ante-retrograde St. Thomas cardioplegia (group A), in 247 patients only retrograde way of supply St. Thomas cardioplegia was used (group C). In group B ($n=73$ patients) also retrograde way at the St. Thomas cardioplegia was used with mixed with perforan for better myocardial protection in doses 200-300 ml. Perftran was added by 100 ml to 300 ml of St. Thomas cardioplegic solution.

Results: At whole group hospital mortality was 4.1% ($n=64/1574$). Respectively group A - 4.7% ($n=59/1254$), group B 1.2% ($n=3/247$) group C 2.7% ($n=2/73$) ($P < 0.05$). The reasons of deaths: heart failure ($n=43$), brain damage ($n=7$), bleeding ($n=5$) pneumonia ($n=4$), others ($n=5$). Lethal heart failure was not marked in group B and C only in group A (3.4% - $n=43/1254$).

Conclusions: Improved myocardial protection by using only retrograde cardioplegia (group B-C) lead to better results and low risk of postoperative heart failure than in group A.

CP50

COMPLETE RECONSTRUCTION OF THE MITRAL VALVE DISEASE

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Objectives: To analyzed possibilities of correction of the left parts of the heart by reduction of LA with preservation of MV's apparatus during MVR.

Methods: During 1997-2007 years one hundred and twenty-eight adult patients (pts) were operated with mitral valve diseases (MVD) and giant LA (diameter 60 mm and more) (group A). Average age was 52.4 ± 6.3 years. Eighty-three (64.8%) patients were in IY NYHA class and 45 (35.2%) in III class. Predominant etiology was rheumatism. There were used monodisc (Allcarbon-type) with orientation of the large margin to the posterior leaflet ($n=35$), bileaflet ($n=93$). LA's plasty was performed by Kawazoe's method. Preservation of posterior leaflet (performed in all patients) and together with translocation of anterior leaflet's papillary muscles was performed together with MVR ($n=49$). Concomitant procedure on aortic valve ($n=21$) and tricuspid valve ($n=12$). Combined ante-retrograde St. Thomas cardioplegia and moderate hypothermia ($27-34$ °C) were used. Cross-clamping time of aorta was 73.2 ± 10.2 min. Control group (mitral insufficiency) - only MVR without preservation of MV ($n=147$) (group B).

Results: There were three deaths at the hospital period (hospital mortality (HM) - 2.3%) (group A). The reasons of deaths were: heart failure (1), brain damage (1). There are not any episodes of bleeding, thromboembolic events or prostheses's failure at the hospital and remote period. At the remote period (average was 5.3 ± 1.4 years) 103 patients were followed up. Data of echo for group A: preoperative EFLV - 0.55 ± 0.04 , postoperative (6-7 day) - 0.53 ± 0.02 and remote period 0.56 ± 0.04 ; and diameter of LA (mm) - preoperative - 64.2 ± 3.1 , postoperative - 47.4 ± 6.2 , remote period - 46.8 ± 5.2 . hospital mortality in group B - 3.4%. Data of echo for group B: - preoperative EFLV - 0.54 ± 0.04 , postoperative (6-7 day) - 0.51 ± 0.03 and remote period 0.47 ± 0.03 ; and diameter of LA (mm) preoperative - 65.4 ± 7.4 , postoperative - 66.8 ± 7.4 , remote period 73.3 ± 6.2 . In group B ($n=133$) there were episodes of thromboembolic events ($n=4$), heart failure ($n=12$), prostheses's failure (0). There were four deaths (all - progressive heart failure).

Conclusions: Reconstruction of the left part of the heart for MVD by preservation of MV and LA's plasty during MVR was allowing to improve indexes of LV's and LA's morphometry, contractility during early and remote postoperative period.

CP51

RESULTS OF DIFFERENT SURGICAL THERAPY IN TREATMENT OF ISCHEMIC MITRAL VALVE REGURGITATION

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Objectives: Different types of mitral valve abnormality after myocardial infarction has been advocated, although clear influence on outcome of it has not been established. Surgical intervention is playing an increasingly important role in management of patients with moderate or severe ischemic mitral regurgitation (IMR) as result of left ventricular geometrical distortion. The aims of our study was to review survival rates and results of various types of mitral valve repair after surgical treatment of ischemic mitral insufficiency in addition to CABG.

Methods: Using prospectively maintained database, patients with moderate to severe IMR were divided on the basis of surgical strategy. CABG alone or combined with mitral surgery for ischemic MR was performed on 243 (24 females, 219 males) consecutive patients from January 2006. Mitral valve reconstruction with different types of ring or flexible ring and band was performed. According to surgery 170 patients (69.9%) made up combined group (CG) and 73 patients (30.1%) isolated CABG one (IsG). Average patient age was 56.1 ± 7.8 years. The 1-year outcome was observed. SPSS statistical program was used.

Results: The average risk of operation on EuroSCORE has made 5.5 ± 2.84 and number of distal anastomoses was 2.95 ± 1.03 (range: 1-6). Operative (<30 days or in-hospital) mortality rate was 5.7%. There are no difference in 1-year survival between groups (95.1% vs. 93.2%, $P>0.05$). In CG before operation indexes of EDV and ESV, local and global contractility, configuration of mitral valve were impaired significantly in compare with IsG. During follow-up we observed severe reduction of LV volumes only in CG, but they were still significantly larger than in IsG (EDVi 85.2 ± 25.1 vs. 64.3 ± 19.8 ml/m²; ESVi 53.2 ± 20.5 vs. 35.6 ± 13.4 ml/m², $P<0.05$). In CG the type of used annuloplasty did not influence recurrence of IMR in compare to rigid ring (OR and 95% CI for posterior pericardial annuloplasty is 0.91 (0.20-2.91), $P=0.89$; for flexible undersized ring - 1.75 (0.38-8.11), $P=0.47$; for Geoform ring - 3.08 (0.53-13.82), $P=0.17$). Unfortunately IsG patients have had more severe level of residual MR (OR and 95% CI -19.29 (6.3-58.6), $P<0.001$) and worse parameters of MV deformation (tenting area 1.87 ± 0.46 vs. 1.5 ± 0.6 sm², $P<0.05$).

Conclusions: The type of undersized annuloplasty used did not influence outcome. Despite comparable survival CABG alone associated with increased IMR residual level. The risk of recurrence of MR on follow-up was related to severe postoperative mitral valve deformation.

CP52

QUANTITATIVE ASSESSMENT OF MITRAL ANNULUS DYNAMICS IN PRE- AND POST-SURGICAL MITRAL REPAIR WITH IMPLANTED ANNULAR PROSTHESIS USING REAL-TIME 3D ECHOCARDIOGRAPHY

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Objectives: In patients with chronic degenerative mitral regurgitation (MR) caused by leaflet prolapse, annular dilatation is a common feature. Accordingly, patients undergoing surgical repair usually undergo concomitant reductive annuloplasty with implanted annular prosthesis. However, no tools are available to evaluate in-vivo the changes in dynamics and shape induced by this intervention. Our goal was to apply custom software for the 3D dynamic analysis of the mitral annulus (MA) to transthoracic real-time 3D echocardiographic (RT3DE) datasets acquired pre- and post-surgery to evaluate changes induced in MA geometry and dynamics.

Methods: RT3DE imaging (iE33, Philips) was performed in 10 patients with MR, pre- and three months post-surgery with implant of annular prosthesis (Cosgrove Edwards Ring and Edwards Physio- Ring). Custom software based on optical flow techniques was used to semi-automatically track the MA in the 3D space and calculate end-diastolic (ED) and end-systolic (ES) MA surface area, MA surface area change ($100 \cdot (\text{Max area-ED})/\text{ED}$) and maximal MA longitudinal displacement (LD) throughout the cardiac cycle. Moreover, MA peak-systolic (S'), -early diastolic (E') and -late diastolic (A') velocities were computed. Results: As expected, a significant reduction (paired *t*-test, $P<0.01$) in both ED (of about 45%) and ES (of about 38%) MA surface areas were noticed in the post-surgery datasets. Also, MA surface area change appeared significantly reduced by the intervention, because of the presence of the constraining annular prosthesis. No changes in MA velocities and maximal LD were observed between pre- and post-intervention.

Conclusions: Dynamic analysis of the MA applied to RT3DE datasets is feasible in patients undergoing surgical repair with concomitant implanted annular prosthesis. This new technique allowed to evaluate in-vivo the changes induced by the intervention in 3D MA geometry and dynamics. In particular, the proposed procedure could be utilized to gain new insight about the in-vivo performance of the implanted annular prosthesis, offering to the surgeon a new tool for support in the clinical decision process and in follow-up monitoring.

CP53

IMPROVED DESIGN TO ENHANCE PATIENT-PROSTHESIS INTERACTION AND POSTOPERATIVE HEMODYNAMIC PERFORMANCE FOLLOWING STENTED AORTIC BIOPROSTHESIS IMPLANTATION

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Objectives: Postoperative hemodynamic performances of valve prosthesis have been correlated to the internal diameter of the prosthesis and to their performance index (the ratio between effective area and geometric area of prosthesis). Patient-prosthesis interaction, depending upon the design of prosthesis and patient outflow characteristics, could be, however, as relevant as the prosthesis size in improving postoperative hemodynamic performances. To verify this hypothesis we compared hemodynamic performances of two group of patients receiving identical size ($n=23$) of two bioprostheses with identical internal structure but different ring and cuff design (Perimount standard and Perimount Magna).

Methods: Forty-eight elective patients undergoing AVR (plus minus CABG) and receiving a size 23 Perimount standard bioprosthesis (Group PS 27 patients) or a size 23 Perimount Magna bioprosthesis (Group PM 21 patients) were enrolled in this retrospective study. Early postoperative hemodynamic performances (in terms of effective orifice area and trans prosthetic gradient) were recorded by mean of trans thoracic echocardiography (TTE) within one month from surgery and were compared between two groups.

Results: Patients of two group did not differ in terms of mean age, BSA and combined CABG procedure (75 ± 6 and 74 ± 8 , 1.8 ± 0.2 and 1.8 ± 0.3 , 60% and 66% for group PS and PM, respectively). Postoperatively hemodynamic performances of group PM were significantly superior compared to PS group in terms of both EOA (1.65 ± 0.4 and 1.4 ± 0.4 cm², respectively, $P=0.037$) and EOAI (0.92 ± 0.2 and 0.8 ± 0.2 cm²/m², respectively, $P=0.045$). Conversely the incidence of severe patient-prosthesis mismatch (EOAI < 0.60 cm²/m²) was significantly reduced in patients of PM group compared to patients of PS group (0% and 18%, respectively). Trans-prosthetic peak and mean gradient

confirmed improved performances of PM group compared to P5 group (15 ± 6 and 23 ± 9 mmHg $P=0.001$; 5 ± 1 and 10 ± 4 mmHg $P<0.001$, respectively). Conclusions: Despite identical internal structure for a given size Perimount Magna allows for improved postoperative hemodynamic performances compared to standard Perimount. These data support the concept that patient-prosthesis interaction is a key factor in determinate post-implantation hemodynamic performance of a valve prosthesis.

CP54**SILDENAFIL FOR TREATMENT OF SECONDARY PULMONARY HYPERTENSION IN HEART TRANSPLANT CANDIDATES**

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Objectives: Pulmonary hypertension (PH) is a predictor of right heart insufficiency after orthotopic heart transplantation (OHT). Aim of the study was to evaluate the effectiveness and safety of sildenafil therapy addressed to decrease pulmonary vascular resistance (PVR) in heart transplant candidates, who may otherwise have been excluded because of PH.

Methods: We analyzed right heart catheterization results of 6 men (aged 47-61) with well-grounded OHT indications, performed as a part of routine pre-OHT evaluation. PH was diagnosed in patients with transpulmonary gradient (TPG) >12 mmHg and/or pulmonary vascular resistance (PVR) >2.5 Wood units. Patients underwent a PH reversibility test with sodium nitroprusside (NPS) in order to achieve normal TPG and PVR results without drop in arterial systolic pressure below 85 mmHg. Unresponsiveness to NPS was revealed in all subjects. They were subsequently qualified to receive sildenafil therapy in dose of 50 mg bid. **Results:** One month of sildenafil therapy was enough to achieve normal TPG and PVR in three subjects, and acceptable responsiveness of PH to NPS in following two patients. All these patients were qualified for OHT. Therapy was unsuccessful in one patient, which was confirmed also in right heart catheterization after three months of sildenafil use. Therapy was well tolerated in all patients, without significant drop of arterial pressure observed in some of them on ACE inhibitors.

Conclusions: Sildenafil can be effectively used in treatment of secondary irreversible PH in potential heart transplant recipients.

CP55**ACHIEVING TIGHT BLOOD GLUCOSE CONTROL IN A CARDIAC SURGICAL INTENSIVE CARE UNIT**

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Objectives: Tight blood glucose control has resulted in a reduction of infections rate in critically ill patients. The objective of our study was to ascertain better tight blood glucose control in our cardiac surgical intensive care unit through a dedicated staff-oriented educational program.

Methods: An earlier retrospective analysis in our unit established the existence of poor control of blood glucose level in our post-operative patients. Subsequently, a physician-driven tight blood glucose control protocol was initiated which yielded a similar result due to staff non-compliance (54% of the patients did not receive appropriate insulin dose). It was further identified that lack of education was the major attribute. We therefore, embarked on an intensive educational program that span for 18 months. It comprised of weekly in-services, one-on-one communication and group follow-up sessions. Following that period, another analysis was conducted.

Results: The results demonstrated a marked improvement in patients tight blood glucose control as an antecedent to a better staff compliance (98% vs. 54%). The mean blood glucose levels before and after intensive educational program were 11 and 8.3 mmol/l. Additionally, there was a significant reduction in the rate of wound infections after implementation of the staff-oriented intensive educational program from 9.6% to 3.7% ($P=0.02$).

Conclusions: Tight blood glucose control in our cardiac surgical intensive care unit is now based on an established evidence-based protocol. Our performance improvement project demonstrated that intensive education improved staff compliance to blood glucose control protocol that resulted in better controlled BGL and an associated decrease in rate of wound infection.

CP56**EARLY EXPERIENCE WITH MINIATURIZED CARDIOPULMONARY BYPASS (MINI-PUMP) IN CARDIAC SURGERY**

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Objectives: Miniaturized cardiopulmonary bypass (mini-pump) is a new technical advance in CPB circuitry, yet its role in cardiac surgery remains largely unexplored.

Methods: Fifty-three consecutive cardiac procedures (valve and/or CABG) were performed. Nine utilized a conventional CPB circuit (cCPB) with cardioplegic arrest; 26 had off-pump coronary artery bypass (OPCAB); and 18 utilized a mini-circuit (RS) of which 11 had the procedure with cardioplegic arrest and seven had a beating heart on-pump (BHOP) procedure. ACT were maintained >300 s and a cell-saver was used for shed blood.

Results: Most patients were male and a mean age of 63 years ($P=0.83$). There were a high incidence of diabetes, hypertension, smoking, NYHA III-IV. The EF ranged from 20-75% ($P=NS$). Between the cCPB and RS, cross-clamp and bypass times did not differ ($P=0.21$), nor did bypass grafts. For any group atrial fibrillation was low ($<11\%$), and there were decreased blood product transfusion for OPCAB (.12/pt) and RS (2/pt) compared to cCPB (6.4/pt). Platelet counts pre- or post-bypass were preserved for RS (242/193), especially in the BHOP (287/252) subgroup and in OPCAB (239/223) compared to cCPB (198/151) ($P=0.02$). There were no device related complications. There was one death in the OPCAB group. **Conclusions:** Early experience with an industry manufactured miniaturized cardiopulmonary bypass circuit (mini-pump) demonstrates utility and good hospital outcomes in a variety of complex cardiac operations. The preservation of platelet counts and reduced blood product usage has propelled our practice to use a reduced CPB circuit on all CPB cardiac cases. The mini-pump also seems ideal for the BHOP procedure, which we utilized on high risk revascularization patients. The mini-pump appears to reduce the invasiveness of conventional cardiopulmonary bypass circuits.

CP57**USAGE OF A BALLOON FOR TEMPORAL OCCLUSION OF COMPLEX PENETRATING CARDIAC LESIONS, TO FACILITATE REPAIR. REPORT ON THREE CASES**

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Objectives: Determine the effectiveness of usage of intercardiac balloons with probes to facilitate repair of complex penetrating heart lesions.

Methods: Install temporal occlusion balloon through the lesion, or one of the lesions in case they are multiple, while achieving the repair(s).

Results: Three male patients of ages between 19 and 31-year-old (average 25 years) with double penetrating cardiac trauma of 1-1.5 cm in diameter, bleeding, two of which have been hemodynamically unstable during the surgical procedure. In the first case a double lesion of the right auricle; in the second case, a lesion of 1.5 cm in length was found in the left ventricle, at 3 mm from the anterior interventricular passage, without mayor coronary arterial lesions. And in the third case, finding two lesions, one in the right ventricle anterior face, and the other in the left ventricle, posterior. The installation of the occlusion balloon is achieved while the repair through direct closure of the other, using Prolene 4-0. The average internment with favorable outcome was seven days.

Conclusions: The usage of temporal occlusion balloon with probes facilitates the repair of complex cardiac lesions while controlling bleeding, thus enabling the exposing and suturing of the same.

CP58**INITIAL CLINICAL EXPERIENCE WITH A NOVEL BIODEGRADABLE RING IN PATIENTS WITH FUNCTIONAL TRICUSPID INSUFFICIENCY: KALANGOS BIODEGRADABLE TRICUSPID RING**

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Objectives: Tricuspid annuloplasty procedures have been widely performed in clinics for many years. The Kalangos Biodegradable Tricuspid Ring (Kalangos Biodegradable Tricuspid Ring, Bioring SA, Lonay, Switzerland) is a novel prosthesis for the treatment of tricuspid insufficiency. The aim of this study was to evaluate the clinical and echocardiographic results of this novel prosthesis for functional tricuspid insufficiency.

Methods: Between October 2005 and May 2006, 15 patients with the diagnosis of moderate or severe functional tricuspid insufficiency were treated by implantation of a Kalangos Biodegradable Tricuspid Ring. All patients were evaluated clinically and by echocardiography preoperatively, and control tests were performed at the end of the 1st and 6th month following surgery.

Results: Moderate and severe insufficiency was documented in 11 and 4 patients, respectively, in the preoperative tests. One and six months after surgery, 4 patients had trace and 1 patient had mild tricuspid insufficiency, while 10 patients had none. At the 1st and 6th month follow-up, systolic pulmonary arterial pressure, right atrial dimension and right ventricular diastolic diameter were found to be significantly lower than the preoperative values ($P < 0.0001$). The right atrial diameter and tricuspid valve area had decreased significantly at the end of the 1st month; however, no significant difference was found between the 1st and 6th month tests ($P > 0.05$). Three-quarters of the annuloplasty ring had degraded at six months. No complications related to the prosthesis or the procedure occurred within this period.

Conclusions: Kalangos Biodegradable Ring is a promising prosthesis in patients with functional tricuspid insufficiency, with encouraging initial results.

CP59

PREDICTIVE RISK FACTORS FOR EARLY MORTALITY IN OPERATIVE TREATMENT FOR CHRONIC ISCHEMIC MITRAL INSUFFICIENCY

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Objectives: The combination of coronary artery bypass grafting and mitral valve surgeries is closely associated with high in-hospital mortality and morbidity. In this study, we sought to analyze the factors that influence early mortality in 68 patients undergoing coronary artery bypass grafting + mitral valve surgery due to ischemic mitral insufficiency.

Methods: Of 1183 patients undergoing coronary bypass surgery between April 2002 and June 2006, 68 patients (42 males and 26 females) 42-78 years of age (mean \pm S.D., 59.3 \pm 9.1) underwent mitral valve surgery accompanying coronary bypass surgery (survival, $n=59$; mortality, $n=9$). The cases were analyzed regarding the demographic, preoperative, and perioperative risk factors that influence mortality.

Results: The early mortality rate was found to be 13.2% (9/68) in patients with ischemic mitral regurgitation undergoing simultaneous coronary bypass and mitral valve surgeries. New York Heart Association class ≥ 3 , left ventricle end-systolic volume, left ventricle end-systolic diameter, cardiopulmonary perfusion time, preoperative unstable angina pectoris, intra-aortic balloon application, and age > 65 years were determined to be statistically significant risk factors that influence early in-hospital mortality.

Conclusions: Surgery, despite having a high mortality risk in patients with ischemic mitral insufficiency, is considered to be a treatment measure that generally improves the quality of life and prolongs life.

CP60

TRAUMATIC VALVULAR HEART DISEASE: A CONSERVATIVE VALVULAR SURGICAL APPROACH

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Objectives: The traumatic valvular heart disease is very rare. In the literature usually are case reports.

Frequently when a surgical treatment is done, the valve is replaced. This can delay the indication. We study the moment of the surgical indication and the possibilities of valvular repair.

Methods: Five patients have been diagnosed of traumatic valvular heart disease at our hospital, three severe tricuspid insufficiencies and two severe aortic regurgitations. Four were men and one woman, of a mean 47 (27/65) years. All were produced by blunt trauma, two due to a car accident. Three had a multiple trauma. Two cases of tricuspid regurgitation observed early in our experience had a minor symptoms and were observed during a mean of eight years without important changes. Afterwards, they were lost to the follow-up.

Another case was in FC III and was operated. A tear of the anterior leaflet was found. A suture of the tear and tricuspid annuloplasty was performed. The two aortic cases had advanced symptoms. Both had an intimal transverse aortic rupture, associated to a pseudoaneurysm in one, with prolapse of two leaflets. An aortic suture and resuspension of the leaflets were performed.

CP61

NEW SYNTHETIC VALVECONTAINING CONDUIT

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Objectives: For reconstruction in children for right ventricular outflow tract (RVOT) biological conduits are commonly used, with increased risk for accelerated calcification with subsequent valvular stenosis. New synthetic conduit was created for RVOT re-implantation.

Methods: Aortic root (AR) was chosen as prototype. AR consists of some elements: ventriculo-arterial ring, fibrous annulus, sinus of Valsalva (SV), leaflets, commissures, undercommissure's triangulares and sinotubular junction. In a morgue on 40 hearts, according to a specially worked out original protocol we counted morphometry all of AR's elements.

Results: Based on the observed data new synthetic tree leaflets, semi-lunaris AR was created. This conduit has not only all AR's elements, but has a similar form (licensed under RU#2293543, April 25, 2005). The conduit was used in Ross procedure in 13-year girl for RVOT reconstruction. In 24 months there was no any degeneration process in conduit. The most recent peak and mean transvalvular gradients were counted after operation, in 12 and 24 months - 22 mmHg, 25 mmHg, 22 mmHg and 14.8 mmHg, 15.3 mmHg, 13.0 mmHg, respectively. The conduit was used in Ross procedure in 13-year girl for RVOT reconstruction. In 24 months there was no any degeneration process in conduit. The most recent peak and mean transvalvular gradients were counted after operation, in 12 and 24 months - 22 mmHg, 25 mmHg, 22 mmHg and 14.8 mmHg, 15.3 mmHg, 13.0 mmHg, respectively. Conclusions: New synthetic conduit has no any degeneration, comparing to a biological one, and we see good hemodynamics, as a biological conduit as well. This synthetic AR may be one of the variant for RVOT reconstruction.

CP62

INNOMINATE ARTERY REVASCLARIZATION

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Objectives: Different types of innominate artery (IA) revascularization have been introduced to prevent of cerebrovascular complication in patients with multifocal atherosclerotic disease or aortoarteritis to evaluate the long-term effect of revascularizations.

Methods: Twenty-two years period 37 patients were scheduled for PTA in 13 and operative correction in 24. The age of patients varied from 38 to 72 years. In surgical group intrathoracic interventions were in 14, extrathoracic bypasses in seven and combined approach - in 2 patients. Simultaneous CABG and IA revascularizations (bypass, endarterectomy) we perform in two cases. Concomitant supraortic branch revascularization we performed in 10 patients, aortobifemoral or iliac artery repair in five patients. Six patients before or after IA reconstruction treated with myocardial revascularization. Results: There were one procedure - related complication - stroke after PTA and stent implantation in IA position with additional right carotid artery bypass. Second complication - sepsis after isolate IA bypass with synthetic prosthesis. Both patients died (mortality 5.4%). Revascularization were obtained in 37 patients. Three IA stenoses occurred one and two years after stenting and one have to be operated later. Ten years periods two intra-extrathoracic bypasses occluded without a symptoms. Our results show a satisfactory long-term follow-up.

Conclusions: Concomitant open heart surgery with supraortic branch revascularization can be performed with low risk. Endovascular interventions for IA stenosis or occlusion technically flapsible, hemodynamically effective and should be performed with preventive neuroprotective device. PTA should be considered as a first method of treatment.

CP63

CORONARY ARTERY BYPASS GRAFTING OF A PATIENT WITH PSEUDOTHROMBOCYTOPENIA: REPORT OF A CASE

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Objectives: Fifty-three-year-old female patient with coronary arterial disease diagnosed with conventional coronary angiography was planned to be performed an elective coronary artery bypass grafting surgery.

Methods: During preoperative routine controls, on whole blood count, the platelet count resulted in severe thrombocytopenia (6000/mm³). The patient was consulted with internal medicine clinic and with the initial diagnose of pseudothrombocytopenia, the operation was delayed and she was referred to a haematology clinic for further diagnose. With heparinized whole blood, the thrombocyte count resulted in normal range. The peripheral smear of a non-heparinized fresh blood sample showed aggregated thrombocytes forming groups of 5-14 which confirmed the diagnose.

Results: The patient was operated using cardiopulmonary bypass with normal heparinization. No unexpected postoperative complications including bleeding occurred in the early postoperative period. The postoperative platelet count was 11.000/mm³. She had an eventless recovery and was discharged from hospital on her 7th postoperative day. The latter routine polyclinic controls showed no complications.

Conclusions: We think that, pseudothrombocytopenia should be discussed in patients which show thrombocytopenia suggesting operation contraindication. With correct diagnose, those patients can be safely given the chance of operation and be operated with the usual risk of coronary bypass surgery.

CP64

SURGICAL CHALLENGES FOR URGENT APPROACH IN PENETRATING HEART INJURIES

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Objectives: The aim of this clinical study is to assess the characteristics of penetrating heart injury and its surgical challenges for urgent surgical approach.

Methods: Seventeen cases suffering from penetrating heart wounds were evaluated retrospectively in department of Cardiovascular Surgery between 1996-2004. All patients were male. The age of patients ranged from 19 to 36 years, with a mean age of 23.6±5 years.

Results: Median sternotomy, left anterior thoracotomy and right anterior thoracotomy were performed to control the bleeding or to reach to the heart for internal cardiac massage in five, eleven and one patients, respectively. Right ventricle was the most commonly involved site of injury (n=12) followed by left ventricle (n=4) and right atrium (n=3). Left atrial injury was not seen. Mortality rate was 29% (five cases).

Conclusions: Although the most important factor affecting mortality in penetrating heart injuries is rapid transport, an urgent approach applied by a well trained specialist team decreases mortality and morbidity rate. The patient should be quickly evaluated and time should not be spent with laboratory tests for exact diagnosis. We think that internal cardiac massage would be a better choice, and external cardiac massage should be performed with the intention of saving time to explore the patients surgically.

CP65

THE IMMUNOHISTOCHEMICAL ASSAY OF MANGANESE SUPEROXIDE DISMUTASE AND APOPTOSIS IN HEART MUSCLE OF PATIENTS OPERATED ON WITH USED EXTRACORPOREAL CIRCULATION AND CARDIOPLEGIC ARREST

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Objectives: Ischemic heart disease (IHD) is a term for clinical syndromes caused by significantly reduced blood flow to a region of the heart (ischemia). Myocardial ischemia-reperfusion induced by cardioplegic arrest subjects the heart to radical oxygen species (ROS)-mediated oxidative stress and has been associated with cardiac apoptosis. The purpose of the study was to investigate the expression of manganese superoxide dismutase (MnSOD) and the level of apoptosis in heart muscle apoptosis before and after heart arrest.

Methods: The 15 patients indicated for heart surgery due to various heart diseases were included in this study. During cardiac surgery, heart action of eight patients was arrested to 1 h with the usage of solutions termed hyperthermic blood cardioplegia. In seven patients heart action was arrested by cold cardioplegia. We applied the immunohistochemical assay to investigate in the heart muscle the expression of manganese superoxide dismutase. TUNEL (Terminal uridine deoxynucleotidyl transferase dUTP nick end labeling) assay to apoptosis estimation was determined.

Results: The expression of MnSOD in heart muscle biopsy specimens taken before heart arrest were on physiological level in contrast to those taken after surgery were MnSOD level was significantly higher. The number of apoptotic cells was lower after heart arrest than before.

Conclusions: Experimental studies have proofed uncontrolled reactive oxygen species (ROS) formation that lead to oxidative stress and cell death through apoptosis or necrosis. ROS are central to cardiac ischemic and

reperfusion injury. Normally however, their potentially harmful effects in tissue are limited through quenching by endogenous antioxidants such as superoxide dismutase (SOD), catalase and glutathione. There is considerable evidence that exposure to an oxidative stress can induce antioxidant enzymes, such as catalase and Mn superoxide dismutase (SOD), in a variety of systems and that increased expression of MnSOD. Current techniques of myocardial protection during cardiac surgery are developing with the use of less conventional modalities of cardioplegia and have reduced the morbidity and mortality during cardiac operations. Blood cardioplegic solutions appear superior to cold cardioplegia in terms of myocardial protection and adjuncts as glutamate/aspartate enhancement, antioxidant supplementation, nitric oxide donors and maintenance of calcium homeostasis seem effective.

Our data show that the expression of superoxide dismutase was significantly stronger in hearts subjected to cardioplegic arrest. The heart muscle arrest resulted also in lower apoptosis level. This could indicate that cardioplegia reduces oxidative stress. Our results indicated the protective effects the both of cardioplegic (blood and cold) during heart surgery.

CP66

ANGIOGENIC AND THERAPEUTIC EFFECTS OF A NOVEL CONTROLLED RELEASE BFGF FORMULATION IN AN EXPERIMENTAL LARGE ANIMAL ISCHEMIC HEART MODEL

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Objectives: Growth factors, such as basic fibroblast growth factor (bFGF) contribute to angiogenesis in the ischemic heart tissues where it subsequently improves cardiac function. This needs at least 3-4 weeks of therapy to provide stable vascular bed so; we report here a novel controlled release formulation for this purpose and its evaluation on a large animal model to prove the efficacy in an ischemic heart model.

Methods: An injectable in situ forming device was prepared by dissolving poly (lactide-co-glycolide) in N-methyl pyrrolidone then sterilized by gamma ray (25 KGy). 100 µg bFGF was added to the polymer solution. Upon contact to tissue a solid polymeric device will be prepared in situ. Twelve adult female sheep underwent left lateral thoracotomy following anesthesia. The second diagonal branch of left anterior descending coronary artery (LAD) was ligated using 6/0 polypropylene suture. In six animals 250 µl of the formulation was injected in 7-10 points around the infarcted area. In control group similar formulation was administered without bFGF. Echocardiography accomplished before one day and two months after operation. Then the hearts fixed in formaldehyde for pathology and immunohistochemistry (IHC). In IHC, all slides were stained with vWF and SMA (smooth muscle actin) antibodies for counting the capillaries and small arteries both in the infarcted area and border zone. Results: After ligation of the branch ST segment elevation was occurred in all animals. Echocardiographic parameters and cardiac function improved more in study group than control group. In IHC studies, counting of capillaries in the infarcted area and border zone, also numbers of small arteries were statistically higher in the FG group than control.

Conclusions: In pathologic slides we observed diffuse vascular density that can be attributed to efficient delivery of bFGF from the device during treatment period. Upon short biological half-life of bFGF; it can not be expected to observe stable vascular beds in vivo using conventional immediate release formulations so using controlled release forms of bFGF improved cardiac function and angiogenesis. This new method of slow releasing bFGF is quite safe, feasible and efficient in large animal model so it can be easily used in human after more evaluations.

CP67

NEW TECHNIQUE FOR AORTIC ROOT REMODELLING

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Objectives: Operation for aortic root (AR) remodelling is a physiological procedure as it reconstitutes AR with sinus of Valsalva (SV), but technically it is rather complicated and does not secure hemostasis. Our method is technically more simplified for a surgeon, and safer for a patient.

Methods: In a morgue on 40 hearts, and in the hospital in 20 patients according to a specially worked out original protocol we counted measures of

width, depth at different levels of SV. We observed form and contour of SV insertion to a fibrous annulus.

Results: Relying on the observed data a universal form of SV, which is suitable for patients with AR aneurysms and fibrous rings >20 mm, was created.

This form became a base for the developed technique of AR replacement, which was licensed under RU# 2294703 (17 May 2005).

Conclusions: This offered technique has a number of advantages comparing to a standard technique: 1. There is no need to measure SV depth. 2. Simpler and standardized performance of each stage applying this universal form of SV. 3. Possibility to employ synthetic materials as well as xenopericardium for AR replacement. 4. Possibility create more hermetic sutures, especially in cases with xenopericardium usage - it decreases probability of bleeding. 5. This method of AR replacement does not cause any deformation and excludes leaflets damage.

CP68

NEW LABORATORY METHOD FOR EVALUATION OF VENOUS CANNULA

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Objectives: A standard venous cannula is basically biocompatible flexible tubing used for the drainage of the heart during cardiopulmonary bypass surgery. Poor and excessive drainage lead to perplexity in cardiopulmonary bypass surgery. Cannula design is of prime importance for venous drainage during cardiopulmonary bypass. The present study describes an in vitro method to evaluate the performance capability of the different types of cannulas designed in our laboratory and the other commercially available cannulas intended for cardiopulmonary bypass.

Methods: An in-vitro circuit was set-up with silicone tubing between the test cannula encased in a movable preload reservoir, and another static reservoir. The pressure drop value defined as the drainage pressure minus the preload pressure, was measured using Millar pressure-transducers. Flow rate was measured using an ultrasound flowmeter. Data display and data recording were controlled using a LabView application custom made particularly for our experiments.

Results: The pressure drop, flow rate, and cannula resistance, defined as the pressure drop/flow rate ratio were significantly decreased when the cannula diameter was increased for both Smart and Medtronic cannulas. The length of Medtronic cannula increased the cannula resistance. Nevertheless, the length of the 11 F and 17 Smart cannula decreased the cannula lumen resistance. Smartcannula® showed 36% and 43% less resistance as compared to Medtronic venous and Medtronic femoral cannulas, respectively. The cannula shape, straight or curved tips, did not affect the dlp cannula resistance. Out of five cannulas tested, Smartcannula® outperforms the other commercially available cannulas. At 67.5 cm height differential, the mean pressure drop/flow rate ratios were 3.3±0.08, 4.07±0.08, 5.58±0.10, 5.74±0.15, and 6.45±0.15 for Smart, Medtronic, Edwards, Sarns, and Gambro cannulas, respectively, two-way ANOVA, $P < 0.0001$.

Conclusions: The pressure drop, flow rate and cannula lumen resistance can be reliably measured by our experimental set-up. The Smartcannula®, with its self-expanding design, offers an opportunity of venous cannulation without insufficient and excessive drainage. Its diameter will spontaneously adapt to the luminal width of the vasculature, its cannula wall thickness is less than standard, and the collateral drainage is more direct than standard.

CP69

METABOLIC SYNDROME: A NEW FACTOR TO PREDICT UNFAVOURABLE POSTOPERATIVE OUTCOME FOLLOWING ISOLATED CORONARY ARTERY BYPASS GRAFT

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Objectives: Metabolic Syndrome (MS), defined as the combination of Obesity, Hyperlipidemia, Hypertension and Diabetes, has been recently shown to negatively influence epidemiology and severity of coronary artery diseases. Furthermore MS has been correlated to impaired early patency of saphenous vein grafts following coronary artery bypass graft (CABG). In this

study we sought to better elucidate the role of MS in early postoperative outcome following isolated CABG.

Methods: Data prospectively collected from 3600 patients undergoing isolated CABG were analyzed. Patients presenting MS were identified according WHO definition. Furthermore MS severity was scored from 1 to 4 according the entity of each single risk factor presented. Presence and severity of MS were then correlated with early postoperative outcomes in terms of mortality and morbidity.

Results: Out of the overall cohort of 3600 patients, 3468 (85%) presented MS according baseline definition. Among them, however, the majority presented a MS score 1-2 (2272 patients, 63% of total) while 797 (22% of total) presented a MS score 3-4. Presence of MS, regardless MS score, was correlated to a significant difference in early postoperative morbidity (increased incidence of prolonged intubation and ICU stay, increased incidence of pulmonary and infective complications) but not in early postoperative mortality. Furthermore analysis of MS score revealed that incidence of postoperative pulmonary and infective complications were further correlated to the severity of MS with a respective odd ratio of 5.2 and 9.4 in patients with a MS score=4. ROC curve confirmed the correlation between increased MS score and postoperative pulmonary and infective complications.

Conclusions: Presence of MF according baseline definition is quite frequent in western countries, and seems to significantly impact postoperative outcome following isolated CABG. Combination of more risk factors, expressed by an elevated MS score, further influences postoperative outcome increasing the risk of postoperative pulmonary and infective complications.

CP70

CORONARY SPASM COMPLICATING VALVULAR SURGERY. REPORT OF TWO CASES

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Objectives: Coronary spasm is a common complication of bypass surgery, involving the diseased vessels and/or grafts. Severe coronary spasm of normal coronary arteries during or after valvular surgery is still not documented in the literature.

Methods: From 2005 January to 2007 December, 612 valvular surgical interventions have been performed in our institute without significant coronary stenoses, proved by preoperative coronary angiography. During this time we have recognized two patients developing hemodynamic collapse shortly after valvular surgery as a consequence of coronary spasm.

Results: Case 1. A 47-year-old female underwent mitral and aortic valve replacements. During chest closure severe hypotension developed, with diffuse ischemic signs on ECG. Inotropes, vasopressors, Ca-antagonists were administered, intraaortic balloon pump was inserted, but she remained hemodynamically unstable. She was transferred with open chest to the cathlab. Coronary angiography revealed diffuse spasm of both left and right coronary systems, which were angiographically normal two weeks before the operation. Intracoronary nitroglycerin was administered with immediate success. Circulation normalized, the chest was closed on the next day, but later gastrointestinal complications developed (bowel ischemia and cholecystitis), and she was discharged only four weeks later. Case 2. A 50-year-old male underwent prosthetic aortic valve implantation and ascending aorta replacement, the coronary ostia were left in situ (a modified Bentall procedure). In the 5th postoperative hour ventricular fibrillation occurred. After resuscitation ECG showed myocardial ischemia. Urgent catheterization identified significant narrowing of both coronary ostia and a more distal lesion on the right coronary artery. Preoperative angiography was normal. Because of the hemodynamic instability the proximal stenoses were stented, and intravenous nitroglycerin was administered slowly. Recovery was uneventful.

Conclusions: Transitional myocardial ischemia shortly after open heart surgery can be attributed to air embolism. In cases of extensive ischemic ECG changes and hemodynamic collapse resistant to drug therapy one has to consider spastic stenosis of significant coronary arteries. Urgent coronary angiography is the method of choice to establish rapid diagnosis and therapy.

CP71

SEQUENTIAL CABG WITH RADIAL ARTERY

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Objectives: The purpose of this study is to present our experience of CABG with sequential radial artery.

Methods: During last seven years 827 operations of isolated CABG were performed. In 515 operations radial artery graft was used. In 133 (26%) of the cases radial artery was used as a sequential graft. 59 (45.7%) were performed off-pump, 74 (54.3%) were performed on-pump. In 383 (74%) cases radial artery was used as a linear graft with one distal anastomosis. In 95 cases two marginal arteries were grafted, in 10 cases two marginal arteries and intermedia were grafted. In 28 cases diagonal and marginal arteries were grafted.

Results: There were no ischemia during operation and in postoperative period in radial artery revascularization area also in sequential and linear grafting. Inotropic support was similar in sequential and linear groups. There were no mortality in sequential group. Five (1.25%) patients died in linear group. Angina recurrence appeared in 3 (2.25%) patients of sequential group during five years follow-up and in 12 (3.13%) patients of linear group.

Conclusions: Sequential CABG with radial artery has good immediate and follow-up results and could be recommended for autoarterial CABG with multivessel injury.

CP72

SEQUENTIAL CABG WITH INTERNAL THORACIC ARTERY

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Objectives: The purpose of this study is to present our experience of CABG with sequential internal thoracic artery.

Methods: During last seven years 827 operations of isolated CABG were performed. In 712 operations internal thoracic artery graft was used. In 79 (11.1%) of the cases internal thoracic artery was used as a sequential graft. Sixty-one (76.8%) were performed off-pump, 18 (23.2%) were performed on-pump. In all cases of sequential group diagonal and left anterior descending arteries were grafted.

Results: There were no ischemia during operation and in postoperative period in radial artery revascularization area in sequential group. In four cases of linear group hemodynamic instability occurred. Additional autovenous grafting was performed. Inotropic support was similar in sequential and linear groups. There were no mortality in sequential group. Seven (1.1%) patients died in linear group. Angina recurrence appeared in 2 (2.53%) patients of sequential group during five years follow-up and in 16 (2.52%) patients of linear group.

Conclusions: Sequential CABG with internal thoracic artery has good immediate and follow-up results and could be recommended for autoarterial CABG for anterior heart wall revascularization.

CP73

COMPARATIVE ANALYSIS OF DIFFERENT WAYS OF ADMINISTRATION OF THE TEPID BLOOD CARDIOPLEGIA DURING THE COMPLEX SURGERY OF THE DIRECT MYOCARDIUM REVASCLARIZATION WITH VALVE RECONSTRUCTION

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Objectives: The goal of our research was the study of the different ways of the administration of the interrupted tepid blood cardioplegia in connection with patients who suffered from both ischemic heart disease and valves disorders.

Methods: Patients were divided in three groups depending on the way of the administration of cardioplegic solution. In all the groups the tepid blood hiperkalium cardioplegia, supplemented with the magnesium was used. (Caputo et al. 1998). In the first group (12 patients) the antigrade way of administration of the tepid blood cardioplegia was used. In the second group (9 patients) the antigrade administration was used in turns with the retrograde one. In the third group (8 patients) both antigrade and retrograde administrations were used simultaneously. The groups were comparable for the heaviness of the stating conditions and volume of the surgery. In all the groups patients with the serious depletion accounted for more than half of the cases. All the patients received the standard anaesthesia.

Results: According to the average perfusion time (135.2±5.7; 138.6±6.5 and 132.1±4.9 min, accordingly) and the time of the total ischemia the were no verifiable differences between the groups (92.3±7.2; 96.8±5.4 and 94.2±6.1 min). Spontaneous recovery of the heart action was seen in 83.3% of cases in the first group, 87.5% in the second group and 88.8% in the third group. The rhythm disorders in the early aftersurgery was seen in seven cases (58.3%) in

the first group, in 5 cases, (62.5%) 2nd group and 4 cases (44.4%) 3rd group. ECG signs of the myocardium injury took place in 2 cases (16.6%) 1st group and in 1 case (12.5%) in the 2nd group.

Conclusions: The method of the interrupted tepid blood cardioplegia provides the sufficient intrasurgery myocardium protection even in the patients with sever depletion of the myocardium contractility. The best myocardium protection is provided by the combination of the antegrade and retrograde administration of the cardioplegic solution. Simultaneous ante- and retrograde infusion of the cardioplegic solution provides the better electrical stability of the myocardium, possible because of the better distribution of the cardioplegic solution, moreover it is technically simpler, what makes this method preferable.

CP74

THE TECHNIQUE OF SEQUENTIAL CORONARY ARTERY ANASTOMOSIS USING THE SIDE BRANCHES OF THE SAPHENOUS VEIN CONSTRUCTING Y-GRAFT

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Objectives: We report a new technique that consist of a Y-graft using a saphenous vein side branches for sequential anastomosis in total myocardial revascularization.

Methods: This technique consists of a construction a Y-graft using side branches of a saphenous vein for sequential anastomosis in myocardial revascularization. From February 2006 to August 2006, 43 patients with triple-vessel disease underwent coronary artery bypass grafting using this technique. A total of 147 distal coronary anastomoses on 88 sequential anastomoses were assessed in 22 patients at an average of 34.7±8.9 days after a myocardial revascularization operation.

Results: There were no early or late deaths during the mean follow-up period of 124.3± 52.1 days (range, 15-203 days). The mean interval of postoperative angiography was 34.7±8.9 days (range, 15-51 days). The overall patency rate was 91.2%. The only predictor of graft patency is the quality and/or diameter of the native coronary artery.

Conclusions: In selected series of patients who requires complete coronary revascularization, this sequential vein grafting technique provides easy and simple technique of anastomosis and allowing smaller coronary arteries revascularization add a benefit with regard to surgical technique, morbidity and mortality. Therefore, this technique may be offered exclusively to patients who require complete myocardial revascularization using SVG.

CP75

PERICARDIAL APPROXIMATION IN CORONARY ARTERY BYPASS GRAFT SURGERY (NOBEL IDEA)

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Objectives: Redo operations after CABG have been in rise. Several pericardial substitutes were used after coronary artery bypass grafting such as autologous fascia lata, Dexon mesh, glutaraldehyde preserved bovine pericardium, polytetrafluoroethylene 0.1 mm surgical membrane, and biodegradable polyglycolic acid mesh. Herein, we present a new idea to approximate the native pericardium in CABG to reduce the risk of damage of the right ventricle and patent grafts without compromising the coronary artery bypass grafts.

Methods: Between February and June 2007, pericardial approximation in coronary artery bypass graft surgery has been performed in nine coronary patients (mean age, 68.3±12.3 years; range, 59-73 years). The majority were males (70%). Two patients had valvular surgery as well. In the side of the pericardium that covering the coronary artery bypass grafts, a pericardial costo-sternal approximation is performed. The pericardium is held to the costo-sternal junction in the middle and inferior segments using a Vicryl suture n°1 in U fashion. If the other side of the pericardium is free of grafts, the pericardial sternal approximation could be performed. The pericardium is fixed to the sternum using the same sternal wire. Bilateral pericardial costo-sternal approximation was performed in three patients, and combined pericardial costo-sternal approximation and pericardial sternal approximation were performed in six patients. In the first day of CCU, we measured the arterial blood pressure, heart rate, central venous pressure, cardiac index, diuresis, extubation and chest tube drainage. Some of the patients required small dose of inotropic support.

Results: No hemodynamic effects were observed. No ischemic changes are presented in electrocardiogram; and the cardiac enzymes (CK-MB, Troponin)

did not arise significantly. No complications and no mortality are presented in this group of patients.

Conclusions: This new idea in the pericardial approximation in coronary artery bypass graft surgery does not use any pericardial substitute, achieves the maximum approximation of the native pericardium without involving the patent grafts, is an adjustable technique; so pericardial sternal approximation or pericardial costo-sternal approximation could be performed according where the grafts are seated, is a reversible technique; so it could be given up before any sign of patent graft embarrassment, separates and protects the lungs in redo CABG, covers the mammary arteries protecting them in redo CABG, holds the lungs away from them, closes the inferior two third of the pleural cavity and guides the surgeon in redo CABG where and how to locate the borders of the pericardium.

CP76

LEFT VENTRICLE ANEURYSM PLASTY USING OVERLAPPING METHOD WITH CORRECTION OF MITRAL INSUFFICIENCY AND CABG

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Objectives: The purpose of this study is to present our experience in surgical treatment of the patients with left ventricle aneurysm using overlapping method mitral valve repair or replacement and CABG.

Methods: Forty-two patients underwent surgical repair of postinfarction dyskinetic or akinetic left ventricle aneurysm by overlapping method. Using this method aneurysm was resected with the following overlapping formation when free lateral left ventricular wall sutured to interventricular septum and overlapping with another margin. In 36 cases mitral regurgitation was corrected using a synthetic tape of Goretex-like material and in six cases mitral valve replacement was done. Menicanti papillary muscle plasty was performed in 24 patients. All patients had Q-wave myocardial infarction with formation of left ventricle aneurysm. Coronary artery bypass grafting was performed in all patients. Mean age of the patients was 56.5±13.6 (33-74-years-old). Forty (95.2%) of the patients were male. Mean ejection fraction was 30.4±14.2% and varied from 18-46%. Mean left ventricle diastolic size was 64±9 mm, systolic 46.3±11.7 mm. Mean left ventricle diastolic volume was 224±105 ml, systolic 162.5±91.6 ml. Mean additive EuroSCORE was 6, logistic 6.8%. Mean pulmonary artery pressure was 46.5±32.3 mm Hg.

Results: Mean number of grafts per patient was 2.9±1.7. Endarterectomies were performed in 3 cases (7.1%). Mean time of CPB was 118.7±69.4 min. Mean time of aorta cross-clamp was 81.4±63.3 min. Mean ejection fraction increased from 30.4±14.2% to 44.6±6.5% ($P<0.05$). Inotropic support took place in 23 (61.9%) of the patients. 4 (9.5%) patients needed intraaortic balloon counterpulsation (IABC). Mean time of IABC was 7±3 days. In 32 of 36 patients there were no mitral regurgitation or I degree during intraoperative echocardiography and in postoperative period. Mean hospital stay was 24±8 days. There were no hospital mortality. Three patients (7.1%) had a stroke, all with at least partial recovery.

Conclusions: Coronary artery bypass grafting in patients with left ventricle aneurysm plasty using overlapping method could be successfully performed with good results also with additional mitral regurgitation repair or perlace-ment. Menicanti method of papillary muscle plasty gives also good results in this group of patients.

CP77

CORONARY OSTIAL RECONSTRUCTION: SURGERY OR STENTING?

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Objectives: We compared our experience of surgical reconstruction of isolated coronary ostial stenosis over 14 years with unprotected PCI with stenting during last 8 years.

Methods: All operations [$n=19$] were performed from August 1993 to July 2006 on moderately hypothermic CPB and antegrade and retrograde cold blood cardioplegic arrest. Surgical ostioplasty [group 1] were accessed through anterior approach for LMCA plasty in 17 and RCA plasty in 2. Pericardial patch was used in 12 and saphenous vein patch in 7. Routine intraoperative post-

procedure TEE confirmed wide open ostia [5-10 mm] in all. Unprotected LM stenting [group 2 - $n=12$] was performed at a later period of 2/1999-1/2006 bare metal stent in nine and drug-eluting stent in the last 3 patients.

Results: Women dominated group 1 [Men:women 5:14] as opposed to group 2 [8:4]. Surgical patients were younger [mean age 58.4 (42-79) years vs. mean 67 (49-70) years in PCI group]. LMCA ostial calcification was noted in one in group 1 but in six in group 2. Nonelective cases were 10 in surgical group but only four in PCI cohorts. Associated procedures included AVR in 3, LVmyomectomy in one in group 1 but none in PCI group. Operative/procedural success was 100% in both groups with no operation/procedure-related hospital death. Mean followup was 59.5 [6-174] month in group 1 and 25.6 [3-84] month in group 2. Recurrent angina was noted late in five in group 1 and in one in group 2 at six month. No patch aneurysm or calcification was noted in any surgical patient on followup imaging. There were two late deaths [7.120 month] in surgical group. Preop NYHA of 2.8 improved to 1.5 at last follow-up in group 1.

Conclusions: Surgical cohorts constituted a different category of younger patients. Despite a higher percentage of high-risk patients, PCI for unprotected LMCA disease was not associated with an increase in immediate or medium-term complications compared with surgical reconstruction. Our data suggest that surgical ostioplasty provided a durable alternative in selected subset of isolated ostial stenosis. A randomized comparison between the two revascularization strategies for isolated coronary ostial stenosis may be warranted.

CP78

POSTOPERATIVE CARDIAC TROPONIN I IS AN INDEPENDENT PREDICTOR OF IN-HOSPITAL DEATH AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY

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Objectives: All types of cardiac surgery involve considerable injury to the myocardium. However, little is known about the prognostic value of cardiac troponin (cTnI), a cardiac-specific biologic marker. The purpose of this prospective study was to evaluate the prognostic value of cTnI concentrations measured 20 h after the end of surgery in patients undergoing coronary bypass grafting (CABG) surgery.

Methods: Three hundred and twenty consecutive patients undergoing CABG surgery during 18-month period were enrolled. In-hospital death ($n=10$), causes of death, major clinical outcomes, and relation between cTnI concentrations and clinical outcome, were recorded.

Results: cTnI concentration was an independent predictor of in-hospital mortality (cTnI>14 ng/ml, $P<0.05$). The peri and postoperative variable independently associated with in-hospital death were female gender, combined surgery, ejection fraction <30%, and CPB duration and total chest tube drainage volume.

Conclusions: Our study indicates that cTnI concentration at 20 h after the end of surgery is an independent predictor of in-hospital death after CABG. Further, high values of cTnI concentration were associated with a cardiac cause of death and major clinical outcomes.

CP79

NASAL CPAP CARE OF PEDIATRIC CARDIAC SURGICAL PATIENTS AT THE POSTOPERATIVE STATE

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Objectives: After congenital cardiac surgery pulmonary complications seen frequently. The intend of this study is to investigate the effectiveness of nasal continuous positive airway pressure (nasal CPAP) for congenital heart surgery.

Methods: Seven patients who underwent congenital cardiac surgery (aged four months; range 1-9) were supported by nasal CPAP due to tachypnea, hypoxemia, hypercapnia and atelectasis. The preoperative diagnosis was one with TAPVR, the second one with hypoplastic mitral valve with DORV; the rest with TOF. Total corrective surgery was carried out in TAPVR and TOF cases. Pulmonary banding and atrial septectomy was carried out at the hypoplastic mitral valve with DORV case.

Results: Four out of seven patients had required multiple entubation before nasal CPAP treatment. Mean duration 5.1 days (95% confidence intervals [CI]: 2.4-10.5) days. After the nasal CPAP treatment partial pressure of carbon dioxide (PaCO₂) levels drifted from 58.9 (95% confidence intervals [CI]: 52.3-69.7) to (95% CI: 32.7-48.2) mmHg ($P=0.021$) in three days. Six of these

patient had uneventful postoperative course after the non-invasive ventilation. One with Fallot Tetralogy died due to RV failure.

Conclusions: Our clinical experience with nasal CPAP showed that instantaneously administration of Nasal CPAP after extubation may allow avoidance of reintubation in congenital heart surgery. It can also be used for relieve of tachypnea, hypoxemia, hypercapnia, phrenic nerve palsy and atelectasis.

CP80

SELF-BUTRESSING PATCH: A NEW TECHNIQUE TO SURGICAL CLOSURE OF THE SECUNDUM TYPE ATRIAL SEPTAL DEFECT

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Objectives: The advent of interventional device closure has created a shift in the anatomic patterns of ostium secundum atrial septal defects (ASDs) referred to surgery. The unsuitable cases for device closure are larger in defect diameter in conjunction with undermined rims neighboring on the adjacent critical structures that would increase the likelihood of residual shunt postoperatively. To secure a synthetic patch more efficiently, herein is reported on a new technique devised to doubly buttress the defect rims.

Methods: The operation is carried under cardiac arrest using antegrade cold cardioplegia. The right atrial isolation is performed by bicaval cannulation (inferior vena cava and innominate vein). After opening the right atrium, the remnant tissues are trimmed away, and an oval-shape Dacron patch 10% larger than the actual defect size is prepared. The patch is tailored up and down-wards from its three and 9 o'clock to create four attached strips hinged on its 6 and 12 o'clock. The patch is sat by placing two mattress sutures (Prolene 4/0) at the former hinge points. The latter is then sewn to the defect rims for each of its four quadrants by stitching the patch, the defect rim and the Dacron strip sequentially in a manner to doubly buttress the defect rims. Color Doppler echocardiography with contrast study was performed systematically before discharge.

Results: During 2007, 32 patients (mean age 36±12 years) with a mean preoperative ejection fraction of 53±4.1% and discarded for device closing procedure were operated on with the present technique. The average of the defect size, Qp/Qs ratio and systolic pulmonary artery pressure determined preoperatively by Doppler echocardiography were 2.5±0.7 cm, 2.8±0.95 and 42±12 mmHg, respectively. Two patients presented with an aneurysm of the inter-atrial septum, five with juxta coronary sinus type ASD and the remaining were judged to present with insufficient defect rims. The mean time of cardiopulmonary bypass and cardiac arrest were 83±12 and 45±7.3 min, respectively. All patients survived the operation. Two patients were reoperated on for late tamponade associated with Coumadin overdose. The postoperative Doppler echocardiography with contrast study ruled out any residual shunt.

Conclusions: Closing various types of ASD using synthetic self-buttressing patch is a safe and reproducible technique facing various difficult anatomical variants of ASD. Moreover, it helps preserve the pericardium intact in a relatively young group of patients who are at risk for further reoperation.

CP81

PERIOPERATIVE MAGNESIUM SUPPLEMENTATION TO PREVENT ATRIAL FIBRILLATION AFTER CORONARY ARTERY SURGERY: IS THERE STILL A NEED FOR A RANDOMIZED CONTROLLED STUDY?

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Objectives: The role of magnesium administration in preventing the occurrence of atrial fibrillation after coronary artery bypass grafting surgery remains unclear.

Methods: In the first part of a larger trial 160 patients undergoing elective coronary operations in our institution were randomized to study (n=80) or placebo (n=80) groups. The study group received 3 g of magnesium sulfate as an infusion during the operation and then of magnesium sulfate twice daily for five days after the surgery. The control group received saline infusions.

Results: The levels of serum magnesium was normal in the study group and low in the placebo group on the day of the operation and for the first two postoperative days. The incidence of atrial fibrillation in the study group occurred in 20 of 80 (26.6%) and in the placebo group 14 of 80 (17.5%). After excluding patients with the diameter of the left atrium >35 mm we have

identified 48 patients in the study and 53 patients in the placebo group. Their incidence of atrial fibrillation was 6 of 48 (12.5%) and 11 of 53 (20.7)

Conclusions: Prophylactic magnesium supplementation does not reduce the occurrence of atrial fibrillation. There is still a need for a large randomized study to identify the subpopulations of patients in whom it may play an important role.

CP82

SURGICAL ABLATION OF ATRIAL FIBRILLATION WITH IRRIGATED RADIOFREQUENCY: RECOVERY OF SINUS RHYTHM, ATRIAL CONTRACTILITY AND SAFE DISCONTINUATION OF ANTICOAGULANT THERAPY

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Objectives: Radiofrequency (RF) mini-maze procedure during cardiac surgery has been established as safe and effective method for treatment of atrial fibrillation (AF) in different kinds of surgical diseases.

Methods: The rate of stable sinus rhythm (SR), atrial contractility and habitual postoperative therapy at follow-up time were investigated in 149 patients (66 males, 64±8.3-year-old) consecutive patients with permanent (73%) or paroxymal (27%) AF undergoing cardiac surgery at our institution from May 2002 up to December 2006. Concomitant to open heart surgery traditional mini-maze was performed with monopolar (59%), bipolar (38%) or combined (3%) irrigated RF devices. Pulmonary veins (PVs) isolation was assessed by electrophysiological evaluation (EE) at the end of operation and the on 4th postoperative day. Holter Ecg and echocardiography were performed on 3rd, 6th and then every six months. Use of any anticoagulant or antiarrhythmic agents was investigated by telephonic interview.

Results: Permanent pace-maker was implanted in 11 patients. At 31±9 months follow-up 110/149 (74%) patients were in stable SR. Stable SR was present in 83/101 (82%) patients with isolation of both groups of PVs and in 27/48 (56%) patients in whom only one group of PVs or none of them were isolated. Recovery of left atrial contractility was observed in 71% and 93% of patients in SR at 3rd and 6th postoperative month, respectively. Quantitative Doppler flow mitral analysis showed a trend towards progressive recovery (3.52 and 2.33 at 3rd and 6th postoperative month, respectively).

At follow-up time, with the exclusion of 35 patients requiring chronic anticoagulation treatment for other reasons (e.g. mechanical prostheses), 53/114 (46.5%) were assuming antiaggregant agents alone with consequent great improvement of quality of life.

Conclusions: The isolation of all PVs is related to long-term maintenance of SR. Quantitative analysis performed at the term of six months is appropriate to evaluate recovery of left atrium contractility. RF procedure allows safe discontinuation of oral anticoagulant therapy.

CP83

VIDEO-ASSISTED THORACOSCOPY (VATS)- GUIDED LEFT VENTRICULAR EPICARDIAL LEADS IMPLANTATION FOR BIVENTRICULAR RESYNCHRONISATION

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Objectives: Cardiac resynchronisation therapy (CRT) for treatment of congestive heart failure (HF) requires transvenous insertion of both a right and left ventricular pacing leads. Implantation of the left lead by way of the coronary sinus sometimes fails or is unfeasible mostly for anatomical reasons. Alternative techniques for left lead insertion are required and an epicardial approach would be useful.

Methods: Sixteen patients (14 males, age 67.1±7.34 years) with severe HF (NYHA class III-IV), in sinus rhythm all but two and conventional indication to CRT were studied. Surgery in these patients was indicated because transvenous implantation of the left lead failed due to the absence of favourable vessels anatomy or not suitable as detected at preoperative coronary sinus CT. In right lateral decubitus position and under single-lung ventilation a lateral left minithoracotomy (3 cm) in fourth intercostal space was made and a camera port was inserted in the same space. A pericardial 2 cm incision was made and one or two electrodes were sewed or screwed in. The lead was guided subcutaneously to the pacemaker.

Results: All patients were extubated in 1h after surgery and remained in the intensive care unit for <18 h. Chest tubes were removed after a mean

of 1.8±0.5 days. All patients were discharged after a mean of 4±1 days. Intraoperative and pre-discharged pacing thresholds at one month were <1.5 V/0.5 ms in all cases, with pacing impedance <1000 Ohm. There was neither surgical morbidity nor mortality.

Conclusions: In this preliminary series of patients VATS and very small thoracotomy seem to be an excellent procedure for epicardial lead implantation. It is a feasible and safe procedure with optimal pacing results at a short intervention time and tolerable stress for the patients.

CP84

ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY REDUCES LATE POSTOPERATIVE SURVIVAL

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Objectives: Atrial fibrillation (AF) is the most common complication after coronary artery bypass grafting (CABG) surgery, increasing morbidity and mortality. The impact of AF on postoperative survival is still unclear. This study aims to ascertain the impact of AF after CABG on postoperative survival and to assess its prognostic role on cause-specific mortality.

Methods: One thousand eight hundred and thirty-two patients undergoing isolated CABG between January 2000 and December 2006 at two Cardiac Surgery Centers in Northern Italy were prospectively observed, and those affected by postoperative AF were identified and followed-up until death or study end (April 30, 2007). Long-term survival was evaluated using Cox proportional hazard methods. The role of AF occurrence during follow-up was evaluated, in a time-dependent Cox model, as well as its interaction with postoperative AF.

Results: Five hundred and thirty-two patients (31%) developed AF after coronary surgery. Patients affected by postoperative AF experienced a longer hospital stay (9.4±6.2 vs. 8.1±5.2 days, $P<0.001$). Hospital mortality was also higher in AF patients (3.3% vs. 0.5%, $P<0.001$). There were 26 (1.4%) in-hospital deaths. The remaining 1806 patients were dismissed, and have been followed-up for a median of 51 months. One hundred and twenty-six (6.9%) of them died after a median of 14 months. Long-term mortality rates were significantly poorer for patients with postoperative AF (61 deaths, 2.99 per 100 person year), compared to the patients who did not develop the arrhythmia (65 deaths, 1.34 per 100 person year). At Cox regression, patients with AF were shown to be at higher risk of dying from embolism (HR 4.07).

Conclusions: Postoperative AF affects early and late mortality after isolated CABG surgery. A careful postoperative surveillance with a specific antiarrhythmic prophylaxis is recommended, in order to reduce the risk of fatal embolic events.

CP85

ASCENDING AORTA SURGERY IN PATIENT WITH ISTHMUS AORTIC COARCTATION

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Objectives: Surgical management of thoracic aortic coarctation associated with ascending aortic aneurysm is difficult in most cases. The aim of the present study was to assess the results of surgical strategy for the ascending aorta replacement combined with isthmus aortic coarctation correction.

Methods: Between 1996 and September 2007, 57 patients (41 males, mean age of 32±3.5 years) underwent surgical treatment for ascending aortic aneurysm and isthmus aortic coarctation. Nineteen patients, who underwent first-step correction for coarctation, were not included into the study. They were claimed to potential second step ascending aorta replacement.

Sixteen patients (single-stage group 28.1%) in severe cardiac and coarctatic conditions underwent simultaneous ascending aorta replacement and aortic coarctation correction. Fourteen patients (two-stage group 24.6%) were successfully treated with a two-stage operation. The first stage consisted in the correction of a dominant pathology; the second procedure was performed 6.4±3.9 months later. Twenty-seven patients underwent surgery late after coarctation correction (in average -17.2±4.2 years). Repair of the ascending aortic aneurysm was performed with Bentall-DeBono technique and supracoronary graft repair. Aortic coarctation repair included end-to-end anastomosis, synthetic patch, and ascending-descending aorta bypass graft. Bilateral perfusion was applied as alternative to ordinary cardiopulmonary bypass.

Results: Overall hospital mortality was 7%, with no significant difference between groups. Mortality was due to multiple organ failure, distal aortic rupture, neurological complications.

Conclusions: Surgical approach with simultaneous and two-stage operations (depending on the degree of anatomic and hemodynamic abnormality) for the treatment of ascending aortic aneurysm associated with isthmus aortic coarctation showed good immediate results.

CP86

THORACIC AND ABDOMINAL AORTIC ANEURYSMS - 6 YEARS EXPERIENCE

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Objectives: To review the results of thoracic and abdominal aortic aneurysm repair for 79 patients. The age ranged from 32 to 77 years (mean 47). Male to female ratio was 2.5:1. Twenty-one patients had thoracic aortic involvement, 16 ascending aorta, 3 aortic arch and 2 had descending aortic disease. Sixty-one patients had abdominal aortic involvement, with 58 infrarenal and 3 suprarenal aortic disease. Three had coronary artery disease, 2 had valvular disease, 24 had hypertension, 37 had peripheral vascular disease, 1 had carotid artery disease. Twenty-nine were diabetic and 7 were having COPD. Fifty-nine were operated electively and 20 as emergency. Ten patients expired postoperatively due to renal failure, bleeding, stroke or myocardial infarction. Follow-up was with clinical examination and X-rays over a period of three years.

Methods: Seventy-nine patients underwent surgery for thoracic and abdominal aortic aneurysms. Ascending aorta and arch were approached by median sternotomy. Thoracic aorta was approached by left thoracotomy and abdominal aorta by midline laparotomy. After heparinisation (3 mg/kg), femoro femoral bypass was employed in ascending and arch aneurysms. Total circulatory arrest was employed in arch aneurysms, partial bypass in descending thoracic aortic aneurysms. Cerebral perfusion was maintained by single carotid artery canula. Aortic canula (Sarns metal, USA) and straight femoral canulas were employed. Membrane oxygenators (Polystan, Dideco) were used in all patients. Blood cardioplegia was used whenever necessary. Aortic cross clamp time varied from 50-90 min and bypass time varied from 100-120 min. The total circulatory arrest period ranged from 40-60 min. Preclotted dacron grafts were sutured using 4/0 prolene (teflon felt reinforcement used in arch aneurysms). Aortic valve conduit with implantation of coronaries two and celiac, renal and SMA re-implantation in 2. Inotropic support with adrenaline, dopamine or dobutamine was used. All were electively ventilated for 24-48 h. Five patients required re exploration for bleeding.

Results: Seventy-nine patients were operated for thoracic and abdominal aortic aneurysms. Average ICU stay was 72 h and average hospital stay was 10 days. Ten patients died postoperatively due to renal failure in 4, bleeding in 3, stroke in one and myocardial infarction in 2. Follow-up was done, for a period of three years, clinically and with X-ray.

Conclusions: Surgery of aortic aneurysms can be performed using conventional surgical techniques. Timely surgical intervention in aortic aneurysms yields favourable results with acceptable morbidity and mortality.

CP87

ISOLATED MITRAL VALVE REPLACEMENT AFTER PREVIOUS CLOSED MITRAL COMMISSUROTOMY: RISK-FACTORS OF SURGERY

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Objectives: To analyze risk-factors in surgery of mitral valve diseases (MVD) after previous closed mitral commissurotomy (PCMC).

Methods: During 2000-2007 years, 1574 patients with MVD were operated with CPB. Predominant genesis of MVD was rheumatism, lipoidoses, atherosclerosis and others. Following methods of surgical treatment were used: MVR ($n=1251$), MVR+correction of tricuspidal valve by De Vega ($n=323$). Two hundred and forty-five (15.6%) operations were performed after PCMC (group A). Previous brain damage with neurological deficits (cysts) were marked in 215 (13.7%) patients. There were 86 (40%) males, 129 (60%) females. Patients' age was 29-69 years (mean 54.8±12.6 years). NYHA class in all group were followings: II class 1 (0.5%), III class 27 (12.6%), IV class 187 (86.9%) patients. Ventilation support in ICU 6.4±1.4 h. Preservation of MV's apparatus during MVR was in all cases of mitral incompetence, especially with ESVI >75 ml/mq. All operations were performed with CPB, moderate hypothermia (30-32 °C), combined ante-retrograde St. Thomas crystalloid cardioplegia. CPB time was 118.4±28.6 min and cross-clamping 68.4±8.6.

Commissural tissue in pericardium was discovered at the next variances: 1) complete (including the posterior wall of left ventricle) - 187 (76.4%) patients, 2) right side of the heart and anterior-apical part of the left ventricle - 54 (22.0%) patients, 3) complete only right side of the heart - 4 (1.6%) patients.

Results: The hospital mortality (HM) was 7.1%. HM was higher for group A than B (without PCMC): respectively were 8.1% and 2.5% ($P < 0.05$). The value of HM in group A depends of following main factors: IV NYHA class, small cavity of LV - end-systolic volume index of left ventricle (ESVI) < 15 ml/mq (especially for MS), LV's ejection fraction < 0.35 , systolic pressure in pulmonary artery > 90 mmHg, massive thromboses of LA (thrombotic masses more than 1/3 of volume), constrictive pericarditis, calcification on valve +3, organic tricuspid valve diseases, discovered of the commissural tissue only right side of the heart.

Conclusions: Correction of MVD after previous CMC should be better performed, when both ventricles will be discovered of commissural tissue for better myocardium protection at procedure. The combination of described risk-factors increases value of HM.

CP88

SURGICAL RESULTS OF ACUTE TYPE A AORTIC DISSECTION IN A SINGLE HOSPITAL: 20 YEARS EXPERIENCE

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Objectives: Although early diagnosis and the advances in surgical techniques have contributed to the decline in mortality rates in the current era, acute aortic dissection is still associated with a high surgical mortality and morbidity rates. This study aims to demonstrate perioperative risk factors for death in patients with acute type A aortic dissections performed in our center over a period of 20-years.

Methods: A retrospective comprehensive analysis was completed of 26 clinical variables and their relationship to surgical outcomes in 294 consecutive patients enrolled in Kosuyolu Heart and Research Hospital from 1987 through 2007. Clinical characteristics, intraoperative and postoperative variables were reviewed.

Results: The overall in-hospital mortality was 26% (77 of 294). Independent preoperative predictors of operative mortality were total circulation arrest time (odds ratio=1.32), preoperative renal dysfunction (odds ratio=8.33), preoperative shock or tamponade (odds ratio=3.11).

Conclusions: Our experience confirms that patient selection plays an important role in determining surgical outcomes in patients with acute type A aortic dissection. Risk assessment in patients with acute type A aortic dissection provides better preoperative management and favorable surgical result.

CP89

EARLY, MID-TERM, AND LATE RESULTS OF AORTIC VALVE REMODELING WITH DR URBANSKI SEPARATE PATCHES TECHNIQUE

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Objectives: In July 2006, we introduced Dr Urbanski aortic valve remodelling technique described in 2005 in 20 patients.

Methods: Fourteen patients with complicated aortic root pathology were operated on, 9 males, 5 females, aged 27 to 64, including four with de Bakey type I dissection, 13 with severe IA, one, aged 27, without IA, but with 29 mm aortic annulus and with the lost of almost whole coaptation area. Logistic EuroSCORE ranged from 4.65-59.4%, and was $12.79 \pm 3.86\%$ on average. In all 10 patients without dissection Non-Coronary Sinus was exchanged. Right Coronary Sinus patch was required in four of them; reduction wedge plasty of 1 or 2 Valsalva Sinuses in 3. Additional procedures were necessary to achieve valve competency: El Khoury plasty of 3 cusps in 2, and subcommissural annuloplasty in two patients. Supracommissural implantation of ascending aorta prosthesis of the chosen diameter completed all operations. Four patients had de Bakey type I dissection, 2 chronic, 2 acute, causing severe aortic valve insufficiency. Three had exchanged their Non-Coronary Sinuses with a patch. Left Coronary Sinus patch, and hemiarch technique distally was required in one patient. Remaining dissected Valsalva Sinuses were repaired on sino-tubular junction (or rather sino-prosthesis junction) level.

Results: In 11 patients, including these with dissections and those with additional procedures, we achieved excellent early results. In two the result on TEE was inadequate (IA grade II), and conversion to AVR was necessary. In 13 patients the in hospital follow-up was uneventful. One patient with four month old chronic de Bakey type I dissection, diabetes, and arterial hypertension despite technically good result died on postoperative day 1 from renal and multiorgan failure. No IA recurrence occurred during follow-up from 2-19 months.

Conclusions: Dr. Urbanski technique: Allows individualize reconstruction of aortic root according to the given patient pathology and deal with every component of functional aortic annulus. Permits to spare all good quality tissue. Gives very good view of the valve and allows do procedures on cusps precisely. Is particularly indicated when not all sinuses have to be exchanged. Meets the needs for new methods suitable for less advanced pathologies repair. It is appropriate for aortic insufficiency in aortic root dissection repair Therefore, the results are promising and should be long-lasting.

CP90

RETROGRADE CEREBRAL PERFUSION FOR THE ASCENDING AORTA AND ARCH ANEURYSMS CORRECTION

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Objectives: To present the experience of surgical treatment of ascending aortic and arch dissecting aneurysms.

Methods: From 1994 to 2007, 89 patients with ascending aortic and arch dissecting aneurysms were operated on in our institution. There were 73 (82.0%) males and 16 (18.0%) females, age 22-68 years, mean 48.8 ± 4.6 years, 13 (14.6%) of patients were in class III NYHA classification, 76 (85.4%) in class IV NYHA. The reasons of aneurysms: hypertension, atherosclerosis 45 (50.6%), Marfan syndrome 17 (19.1%), cystomedionecrosis 13 (14.6%), bicuspid aortic valve 7 (7.9%), falling down from the high 1 (1.1%), aortitis Takayasu 2 (2.2%), others 4 (4.5%). All patients were operated on with cardiopulmonary bypass (CPB) in deep hypothermia (DH), with cardiac arrest and retrograde cerebral perfusion (RCP) via superior vena cava (SVC). The following operations were used: a) supracoronary replacement with the aortic valve cusps resuspension 58 (65.2%); b) Bentall's operation in our modification 25 (28.1%); aortic arch replacement 5 (5.6%); Wheat operation and arch correction 1 (1.1%). Myocardial protection cold crystalloid antero-retrograde cardioplegia. Cannulation of femoral artery (FA) was performed in all cases. There were 25 patients operated on with DH ($16-18^\circ\text{C}$), CPB blood flow $500-750$ ml/min/m², SVC pressure 15-20 mmHg and mean RCP time 34.6 ± 8.8 min during 1994-2002 period (group A). Sixty-four patients were operated on with RCP and DH ($12.5-14^\circ\text{C}$), CPB blood flow $250-500$ ml/min/m², SVC pressure 10-12 mmHg and perfusion via FA was conducting during the all RCP period. The RCP time was 56.8 ± 10.4 min group B, during 2003-2007.

Results: General hospital mortality was 20 (22.5%); 27.9% (17 from 61) for urgent cases and 10.7% (3 from 28) for elective cases. Mortality in group A was 7 (28%), two of patients died because of brain damage. The mortality in group B was 13 (20.3%) with one neurological events.

Conclusions: Impoved combined RCP with low pressure in SVC and low blood flow of extracorporeal circulation, DH ($12.5-14^\circ\text{C}$) with permanent perfusion through FA (group B) are better methods to preserve brain during the long periods of arch and hemiarch correction in cases with ascending aortic and arch dissecting aneurysms.

CP91

DYNAMIC STJ REMODELING

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Objectives: Isolated aneurysmatic dilatation of the ascending aorta often involves the sinotubular junction (STJ), which results in valvular incompetence even if the leaflets are structurally intact. The dislocated commissures can be readjusted by various methods. The objective of this operation is the choice of the appropriate sized prosthesis necessary for restoring competence of the valve.

Methods: Previously used geometric principles are derived from anatomical studies. The authors describe a new transesophageal echocontrolled intraoperative under pressure technique, to determine the appropriate size of the neo-STJ.

Clinical introduction of the novel dynamic measurement aortic strap.

Results: The dynamic remodelling is carried out on beating heart - at closed aorta -, which besides notable time-sparing may reflect more the function than the anatomy of the root. The method significantly reduces the cross-clamp time, and provides reliable informations of the aortic root under pressure conditions.

Conclusions: The STJ reduction may be applicable very effectively with a simple callipered-silk strap in carefully selected cases where the aortic regurgitation is proven to be caused by the radial expansion of the commissural distances.

Keywords: Aortic valve insufficiency, ascending aorta, aneurysm, sinotubular junction, remodeling, functional anatomy.

CP92

THE INFLUENCE OF INTACT PLEURA ON POSTOPERATIVE RESPIRATORY DYSFUNCTION AFTER CORONARY ARTERY BYPASS GRAFTING (CABG) USING BILATERAL INTERNAL MAMMARY ARTERIES (BIMA)

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Objectives: Bilateral internal mammary artery harvesting for coronary artery bypass graft had shown to be superior compared to venous grafts in regard to cardiac events, however, the major drawbacks from such technique is early postoperative complications; namely bleeding, wound infection (deep or superficial) and impairment of respiratory function. The aim of this work is to study the effect of opening the pleura on postoperative complications.

Methods: We tested the hypothesis of modifying the surgical technique when harvesting bilateral mammary arteries with maintaining pleural integrity (Npo group A n=25) and conventional technique with pleura opened (po group B n=25) and its effect on early postoperative complications.

Results: Patients in group A (Npo) had demonstrated more favorable early postoperative outcome compared to group B (po) evidenced by better PaO₂/FiO₂, dynamic spirometry function (FEV1 72.5% vs. 59.9% of expected and FVC 64.5% vs. 52.3% of expected), less morbidities (4 incidences vs. 10 incidences), less postoperative bleeding (461 ml vs. 570.8 ml) and better cough score.

Conclusions: Meticulous harvesting of bilateral internal mammary artery with preservation of pleura could dramatically decrease early postoperative complications associated with such technique.

CP93

AORTIC VALVE SPARING OPERATIONS - LONG-TERM RESULTS

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Objectives: Sixteen years has gone since first publications about aortic valve sparing operations, those procedures became a standard in cardiac surgery. During this time Yacoub and David procedures have evolved, resulting in many modifications and types. In spite of the differences in basic consideration of remodelling and reimplantation techniques the aim is the same: to retain the functioning valve leaflets of the patient, to avoid of anticoagulation reducing thromboembolic and hemorrhagic incidents, to reduce risk of endocarditis.

Methods: During five years we performed 29 David procedures and 10 Yacoub procedures in our clinic. There were 26 male and 9 female. Mean age was 54.6, however, Yacoub group was visibly older than David group (mean 61.6 vs. 51.8, respectively). Three patients (9%) were NYHA 1 class, 19 (54%) NYHA 2, 11 (31%) NYHA 3 and 2 (6%) NYHA 4. Indication for surgery was AAAsc with aortic valve incompetence (29), followed by Aortic Dissection (5) and Marfan syndrome (2). Additional procedures included CABG (6) and mitral valvuloplasty (3). Major postoperative complications were AF (9) AV block (1), excessive bleeding required rethoracotomy, neurocognitive dysfunction (2) Inhospital mortality was 2 (6%). Postoperative TTE examination revealed No AI in 7 (25%) cases, trace 8 (29%), (+) 12 (43%), (++) 1 (4%).

Results: In the beginning of 2008 we followed-up 35 patients. We excluded two patients treated in 2007 from consideration because of too short follow-up. We could not establish follow-up in two cases. The longest follow-up was 5.05 years, shortest 1.11, years and mean 3.08 years. Two patients required re-AVR because of AI. One patient had CABG but with good David procedure

result. Late mortality was 3 patients (9%), however, 2 patients died because of malignant neoplasm and 1 patient (3%) died because of heart failure. Mainly patients were in NYHA 1 and NYHA 2 class (14 and 13, respectively). Only one was NYHA 3. Follow-up TTE revealed AI (+) in 13 (46%) cases, AI (++) in 13 (46%) and (+++) in 2 (7%) cases. We stay with close contact with those two patients. Conclusions: Aortic valve sparing procedures are high effective, freedom from re-AVR is 93%. Examination revealed good tolerance of low and moderate AI by patients.

CP94

NEW DEVICE FOR THE MINIMALLY INVASIVE ENDOSCOPIC GRAFT HARVESTING PROCEDURE - LESS INVASIVE AND ECONOMICAL GRAFT HARVESTING METHOD

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Objectives: We have been reported that utility of the minimally invasive endoscopic graft harvesting procedure with KARL STORZ-ENDOSKOPE system (KARL STORZ GmbH & Co. Germany) for the patient who needs coronary artery bypass grafting (CABG). It is clear that this procedure gives a great benefit to the patients who need CABG. In addition, this device have been brought us not only cosmetic benefit but also economical advantages. Because of this device can be Re-sterilization. On the other hand, there were few disadvantages with this device during harvesting grafts. It is devised when we used that system. Beginning of 2007, the new model of endoscopic system form KARL STORZ was announced that is called Bisleri endoscopic radial artery retractor system which was corrected the disadvantages. Since September 2007, we started to use this new device and have a good feeling of results. We would like to report the utility of these devices.

Methods: 1-2 cm skin incision were made on two positions and harvesting radial artery (RA) as possible in direct vision. Then Harmonic Scalpel (Ethicon Endo- Surgery Inc. Cincinnati, Ohio, USA) and Bisleri endoscopic radial artery retractor system were used, when RA between two skin incisions was harvested. Both devices were able to do Re-sterilization. Scissors type of Harmonic Scalpel was selected, because of good hemostasis.

Results: Fifty CABG cases were indicated endoscopic RA harvesting method. Thirty-five CABG cases were used the former model of the KARL STORZ-ENDOSKOPE system (Group K). Fifteen CABG cases were used the Bisleri endoscopic radial artery retractor system (Group B). Mean harvest time were Group K; 34.1±8.6 min, Group B; 27±5.6 min. There was no significant nerve disorder with all patients arm that RA was harvested at both groups. There was no conversion from the endoscopic method to the conventional method at both groups. There was no hematoma with patients arm after the surgery at both groups.

Conclusions: We think that initial results of Bisleri endoscopic radial artery retractor are acceptable. This device is not inferior compared with the former model. This device is developed and corrected, becoming easy to use than the former model. Although many minimally invasive graft harvesting systems are announced, most of devices are single use thing and they are not economical device. We are using the KARL STORZ-ENDOSKOPE system then these are not single use devices. We suspect that this harvesting procedure may have endoscopic graft harvesting technique spread to our country, because of economical and less invasive.

CP95

HOW TO KEEP IN SITU INTERNAL THORACIC ARTERY TENSION-FREE: PERICARDIAL MOBILIZATION TECHNIQUE IN LEFT-SIDED CORONARY REVASCULARIZATION WITH LITA

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Objectives: In arterial myocardial revascularization, in situ internal thoracic arteries (ITA) are frequently used with high benefit. However, in chronic obstructive pulmonary disease (COPD), excessive expansion of the upper lobe of the left lung towards mediastinum may disturb the course of in situ left ITA routed to the left coronary system. We present a method to protect composite arterial conduits (sequential, T or Y-grafts) from excessively expanding upper lobe of left lung to prevent peroperative myocardial injury.

Methods: ITA grafts were all harvested in a pedicled fashion with low energy cautery and skeletonized with fine scissors. Proximal dissection up to the origin from subclavian artery was made. First intercostal and mediastinal branches were always ligated both to increase flow and to prevent steal phenomenon. Composite grafts, including T or Y, were always performed before beginning extracorporeal circulation. When in situ RITA was used for

LAD, in situ LITA was directed to obtuse branches and distal right coronary artery. Also, we performed left coronary revascularization with only in situ LITA using sequential and composite grafting techniques. The decision to use this technique was given just after aortic declamping and manual ventilation of the lungs. To make ITA grafts tension-free, inverted T-shaped pericardial incision was created and lengthened superiorly being parallel to phrenic nerve. Then, inferior edge of rectangle shaped-flap was turned upwards and stitched to endothoracic fascia on anterior thoracic wall, being parallel to sternum, with zero number cut-edged prolene suture.

At the end, pericardial flap was positioned between in situ ITA medially and ventilated left or right upper lung laterally.

Results: This technique was used in 92 patients without any complication for total arterial myocardial revascularization using in situ ITAs. We performed 34 sequential left lateral wall revascularizations including distal right revascularization with in situ LITA, 16 T-grafting and 12 Y-grafting with in situ LITA, and 30 LAD revascularizations with in situ LITA. In all patients, there were 38 cases with right coronary revascularization using in situ RITA. In some of these cases, we applied this technique for right upper lobe. With this method, free LITA usage in COPD has decreased. We haven't seen any morbidity and mortality.

Conclusions: This technique is a reasonable technique to keep in situ ITAs intact, composite grafts available and tension-free. It may safely be used to increase the usage of arterial conduits in total arterial myocardial revascularization with composite grafting techniques in COPD.

CP96

A NEW METHOD FOR ASSESSMENT OF TRICUSPID ANNULAR DYNAMICS USING REAL-TIME 3D ECHOCARDIOGRAPHY

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Objectives: Being the tricuspid valve function not perfectly known due to its complex structure and interactions with the surrounding heart chambers, the ideal surgical approach to tricuspid valve annuloplasty is still missing. The need for more exhaustive methods of analysis and possibility of simulation of clinical scenarios, led us to develop a virtual model of the tricuspid valve based on the theory of continuum mechanics and on the solution of its equations by means of numerical methods.

Methods: Real time three-dimensional (3D) echocardiographic images datasets were acquired intraoperatively in 10 patients with normal left ventricular function and tricuspid valve, using an epicardial approach. These images were analyzed to semi-automatically detect and track the tricuspid annulus throughout the cardiac cycle. Two points, one on each side of the annulus were manually selected on 10 long-axis cut planes evenly rotated around tricuspid annulus centre. The positions of each point was automatically tracked frame-by-frame in 3D space throughout the cardiac cycle. The points were connected using line interpolation to obtain the annular line and finally, a 3D surface was generated for each consecutive frame throughout the cardiac cycle using a triangulation algorithm by connecting with triangles adjacent tricuspid annulus points. The sum of the areas of all these triangles represented the actual tricuspid annulus 3D surface area, rather than an area projected onto a plane.

Results: The following measurements were obtained and used to describe the dynamic behaviour of the tricuspid annulus:

1) dynamic motion or pulsatility of the tricuspid annulus; 2) longitudinal displacement of the tricuspid annulus throughout the cardiac cycle; 3) maximum tricuspid annulus velocities; 4) anterior-posterior and septum-lateral annulus diameter; 5) non-planarity of the tricuspid annulus.

Conclusions: Transthoracic real-time 3D echocardiography in conjunction with our methodology offers a better understanding of the complex geometry of the tricuspid valve. Moreover, the dynamic behaviour of the annulus can be described. Using this methodology it is possible to evaluate the effects of annuloplasty in three-dimensional annulus shape as well as in tricuspid annulus dynamic motion.

CP97

STAGED VS. COMBINED CAROTID ENDARTERECTOMY AND CORONARY ARTERY BYPASS GRAFTING: SINGLE SURGEON EXPERIENCE

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Objectives: The ideal management of synchronous coronary and carotid artery disease is still controversial. This retrospective study analyzed the outcomes of patients following staged or combined carotid endarterectomy (CEA) and coronary artery bypass grafting (CABG).

Methods: Between January 2001 and December 2007, 4.2% (126/3005) of the patients undergoing CABG surgery had high grade carotid artery stenosis at our institution. Staged CEA and CABG was performed on 33 (Group I) and combined CEA and CABG was performed on 93 patients (Group II). The inclusion criteria for CEA were at least 75% stenosis of one carotid artery and/or presence of ulcerated or unstable plaque determined on duplex ultrasonography. In the combined group CEA was performed during cardiopulmonary bypass with mild hypothermia. Preoperative assessment of patients revealed transient ischemic attack in 12% and stroke in 5%. The mean follow-up was 56.4 months.

Results: Hospital mortality was 3.97%. Mortality rates did not show any significant difference among the groups (mortality was one in group I and four in group II, $P=0.750$). Perioperative myocardial infarction rates also did not differ between the two groups (3% in group I and 2.15% in group II). Permanent stroke was seen in 3% of patients in group I and 3.2% in group II. Combined procedure was associated with lower hospitalisation rates (6.39±2.03 days) whereas hospital stays were longer in group I patients (11.03±3.74 days) ($P=0.000$).

Conclusions: In this single surgeon experience study, it is concluded that patients presenting with concurrent carotid and coronary artery disease may be treated either with combined or staged procedures as both strategies have similar mortality and complication rates. However, prospective randomized studies are required to confirm these results.

CP98

MICROEMBOLI IN CARDIAC SURGERY. PRELIMINARY RESULTS OF A NEW AUTOMATIC EMBOLUS DETECTION SYSTEM

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Objectives: Cerebral microembolism during extracorporeal circulation is associated to a variety of neurological complications including cognitive dysfunction. Transcranial Doppler ultrasound is used to detect microembolic material, both gaseous and solid, into the intracranial cerebral arteries during cardiac surgery, even if its application is limited by complexity and size of the equipment. We tested and validated a multigate transcranial Doppler ultrasound system with real-time embolic signal identification and archival (Department of Electronics and Telecommunications, University of Florence, Florence, Italy), that combines small dimensions and user-friendliness. Microembolism rate was studied in two cardiopulmonary bypass systems: with a roller (Stockert, Munich, Germany) and a centrifugal pump (Medtronic Bio-Medicus, Eden Prairie, MN, USA).

Methods: From November 2005 through December 2007, 34 patients were randomized to one of two pump systems. Inclusion criteria were elective surgery, presence of acoustic temporal window and no cerebral vascular injuries nor previous ischemic events. The Short Portable Mental Status Questionnaire (SPMSQ) was administered to detect and grade mental confusion preoperatively. Before sternotomy, a doppler probe was positioned on the patient's right temple at the level of middle cerebral artery. On post-operative day 4 the SPMSQ test was repeated.

Results: Mean age was 63.1 years (24 to 83). Cardiopulmonary bypass time was 133±65 min and aortic cross-clamp time was 84±75 min. Microembolic rate during extracorporeal circulation was 310.7±411.6 event per hour for the Roller pump group, and 158.0±198.9 for the Centrifugal pump group ($t=1.113$; $P=0.2739$). No patient had a cerebrovascular event. Two patients in the roller pump group experienced moderate mental confusion and a third individual demonstrated mild confusion at SPMSQ, while three patients in the Centrifugal pump group had mild confusion.

Conclusions: The new automatic embolus detection system has proved effective, reliable and easy to use. Microembolic rate with a roller pump is possibly superior to a centrifugal pump, even if this result must be confirmed by a larger number of cases.

CP99

RELATIONSHIP BETWEEN ACUTE REJECTION IN ENDOMYOCARDIAL BIOPSIES AND PLASMA LEVELS PLASMA BARRIER OXIDATION IN HEART TRANSPLANTED PATIENTS

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Objectives: The aim of this study was to evaluate the blood reduction-oxidation potential in heart transplanted patients at risk for acute rejection.

Methods: 5 ml of peripheral heparinated blood venous sample were obtained concomitantly with subsequent endomyocardial rejection surveillance biopsies for 10 heart transplanted recipients, undergoing 110 biopsies in the first six months after transplantation. The biopsies were grouped according to the presence of low grade 0-2 ($n=92$) or rejection grade 3A ($n=18$) of the International Society of Heart and Lung Transplantation. After blood sample centrifugation, plasma was collected and stored at -30°C . Concentrations of plasma barrier oxidation were measured using Oxy adsorbent kit (Diacron srl, Grosseto, Italy). The plasma levels of plasma barrier oxidation were compared in the two groups (3A grade and 0-2 grade of rejection).

Results: The antioxidant power were significantly decreased in the group of biopsies grade 3A vs. the group of low grade cellular rejection (249 ± 23 $\mu\text{mol HClO/ml}$ vs. 320 ± 19 $\mu\text{mol HClO/ml}$, $P<0.01$).

Conclusions: In heart transplanted patients low levels of plasma barrier oxidation were associated with acute cellular rejection.

CP101

OFF-PUMP CORONARY ARTERY BYPASS GRAFTING (OPCABG) IN PATIENTS WITH NON-ST ELEVATION MYOCARDIAL INFARCTION

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Objectives: To evaluate the early clinical results of OPCABG in patients with non-ST elevation myocardial infarction.

Methods: Eighteen patients with non-ST elevation myocardial infarction underwent OPCABG from January 2006 to January 2007. The age average was 58.6 ± 7.5 -years-old. There were 14 (77.8%) male and 4 (22.2%) female. There were 6 (33.3%) patients without myocardial infarction in anamnesis, 12 (66.7%) - with recurrent myocardial infarction, 16 (88.9%) - with arterial hypertension, 8 (44.4%) - with diabetes mellitus, 6 (33.3%) - with chronic obstructive pulmonary diseases, 2 (11.1%) - with heart failure and 1 (5.6%) patient with left ventricular aneurysm. LIMA graft used in all cases. In 17 (94.4%) patients used vena saphena magna and in 1 (5.6%) patient - left radial artery. The radial artery was evaluated with the simple and modified Allen test. In 2 (11.1%) patients underwent PTCA to Cx one month before surgery. Full arterial revascularization performed in 1 (5.6%) patient. All operations performed with usage of Estech Sinergy Plus and Pyramid (Germany) myocardial stabilizatory devices. 8 (44.4%) patients underwent surgery in 6 h after hospitalization, 10 (55.6%) - in 24 h after hospitalization. Total amount of distal anastomosis was 3.1 ± 1.2 . Distal anastomoses were performed to LAD, diagonal branch, Cx systems and RCA. Amount of distal anastomosis performed with LIMA was 18, with VSM -28, with RA - 1. In 17 (94.4%) patients proximal anastomosis was on the ascending aorta, in 1 (5.6%) - on LIMA (T graft). In 1 (5.6%) patient performed off-pump left ventricular aneurysmectomy. All patients observed during six months after operation. Control exam included: X-ray, ECG, ECHO-, CK-MB, ALT, AST, LDH. During all six months patients were under medication with amlodipin and aspirin.

Results: There was no in-hospital mortality. In no one of cases we faced with aborted OPCABG to CPB, reoperations or PTCA reinterventions. In 4 (22.2%) patients were observed ventricular arrhythmias. 4 (22.2%) patients had ECG changing with ST elevation on 1mm. All changes were reversible and became to normal after 48 h. Ventilatory support time consist 5.2 ± 1.4 h. Serious respiratory complications occurred in 1 (5.6%) patient. ICU-stay period was 26.4 ± 3.2 . Hospital stay period was 9.2 ± 1.6 days.

Conclusions: Early clinical results of OPCABG in patients with non-ST elevation myocardial infarction are satisfying. We believe that OPCABG in patients with non-ST elevation myocardial infarction is very beneficial choice and could be used with great success in future.

CP102

DOUBLE VS. SINGLE INTERNAL THORACIC ARTERY HARVESTING IN DIABETIC PATIENTS: ROLE IN PERIOPERATIVE INFECTION RATE

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Objectives: The aim of this prospective study is to evaluate the role in the onset of surgical site infections of bilateral internal thoracic arteries harvesting in patients with decompensated preoperative glycemia.

Methods: Eighty-one consecutive patients with uncontrolled diabetes mellitus underwent elective CABG harvesting single or double internal thoracic arteries. Single left ITA was harvested in 41 patients (Group 1, 50.6%), BITAs were harvested in 40 (Group 2, 49.4%). The major clinical end points analyzed in this study were infection rate, type of infection, duration of infection, infection relapse rate and total hospital length of stay.

Results: Five patients developed sternal SSI in the perioperative period, two in group 1 and three in group 2 without significant difference. All sternal SSIs were superficial with no sternal dehiscence. The development of infection from the time of surgery took 18.5 ± 2.1 and 7.3 ± 3.0 days for Groups 1 and 2, respectively. The infections were treated with wound irrigation and debridement, and with VAC therapy as well as with antibiotics. The VAC system was removed after a mean of 12.8 ± 5.1 days, when sterilization was achieved. The overall survival estimate at one year was 98.7%. Only BMI was a significant predictor of SSI using multivariate stepwise logistic regression analysis (Odds Ratio: 1.34; 95% Confidence Interval: 1.02-1.83; P -value: 0.04). In the model, the use of BITA was not an independent predictor of SSI.

Conclusions: CABG with bilateral pedicled ITAs grafting could be performed safely even in diabetics with poor preoperative glycaemic control.

CP103

LONG-TERM CLINICAL AND ECHOCARDIOGRAPHIC FOLLOW-UP OF A PORCINE STENTLESS AORTIC PROSTHESIS

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Objectives: This report was undertaken to evaluate the long-term clinical and echocardiographic follow-up of patients who underwent aortic valve replacement with the BRAVO 400 Xenograft, an entire porcine aortic root.

Methods: Between February 1992 and January 1994, 67 underwent aortic valve replacement with Bravo Model 400 stentless porcine bioprosthesis at one single institute. Data were obtained annually by means of direct visits and telephone interviews. Transthoracic echocardiography was performed preoperatively, at discharge, at three months, at one year and annually thereafter. Left ventricular mass (LVM) was assessed using the formula proposed by the Penn Convention and indexed to body surface area (Left ventricular mass index, LVMI). Survival and time-related event analysis was performed with the Kaplan-Meier method. Significant differences in echocardiographic parameters were evaluated with repeated-measures ANalysis Of Variance (ANOVA). If statistically significant, Student's paired t -test was then performed, with Bonferroni's method used to correct for multiple comparisons. A $P<0.05$ was considered statistically significant.

Results: There were 26 late deaths at follow-up, seven were valve-related deaths. The actuarial freedom from valve-related death 14 years was $87.0\pm 4.6\%$. The actuarial freedom from cardiac-related death at 14 years was $84.1\pm 4.9\%$. The actuarial freedom from non-cardiac death at 14 years was $69.2\pm 6.6\%$, respectively. 14-year Kaplan-Meier survival of patients younger than 65 years at surgery was $81.8\pm 8.2\%$ vs. $45.7\pm 8.2\%$ for older patients ($P=0.012$, Log Rank Test). Freedom from valve-related death and from cardiac related death was not significantly different between patients younger and older than 65 years at surgery (Log Rank Test). Freedom from non-cardiac deaths was significantly better in patients younger than 65 years at surgery ($P=0.004$, Log Rank Test). Prosthesis replacement was necessary in seven patients for degeneration of the prosthesis. The actuarial freedom from reoperation at 14 years was $85.4\pm 5.2\%$, respectively. At echocardiographic follow-up, the most significant decrease of mean transvalvular gradient was a reduction to 37.4% of the preoperative value at three month. LVMI was significantly reduced by 20.7% at three month and continued to decrease down to 72.4% of the preoperative value at 14-year follow-up. These changes reflected mainly the reduction in septal and posterior wall thickness.

Conclusions: The Bravo 400 aortic prosthesis has provided good clinical and echocardiographic outcomes up until 14 years of follow-up.

CP104

DELAYED STERNAL CLOSURE - AN EFFECTIVE TECHNIQUE FOR LIFE-SAVING ON PUMP CARDIAC SURGERY

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Objectives: Capillary leak and edema associated with cardiopulmonary bypass continue into the postoperative period and can compromise myocardial and pulmonary function in patients. This report describes our experience of 37 patients with simple technic of the DSC following open heart operations over a period of seven years, with the aim of identifying the risks and assessing the outcome of this technique

Methods: There were 2198 patients who underwent open heart surgery at our hospital between March 2001 and November 2007. Standart anesthesia, cardiopulmonary bypass, and surgical techniques were employed. The sternum was left open in 37 patients (1.7%), after the initial operation in 26, after the first reexploration in 8, and after the second reexploration in three patients. The operative procedure were classified as elective in 19 (52.5%), urgent in 7 (32.5%), and emergency in 5 (13.5%) patients. and redo cardiac operations in 3 (8.4%), 3 (8.4%) patients were required cardiopulmonary resuscitation. Mild ventricular dysfunction was present with a mean ejection fraction of 45.3% ($\pm 15.2\%$) an average mean pulmonary artery (PA) pressure of 45 mmHg (± 25.5 mmHg, $n=37$). During prolonged sternotomy, the skin was closed by heavy merselin stitches and covered with sterile dressing. The dressing was changed daily using a strictly sterile technique with povidone iodine.

Results: The 37 patients who underwent DSC after cardiac operations from March 2001 through December 2007 represent 1.7% of all cases in which cardiac surgery. Thirty-two of these patients had the sternums left open in the operating room and five had the sternums opened in the CICU. The patients had an open sternum for 3.48 ± 0.35 days; with a range of 1-33 days six patients (16.7%) were extubated within 24 h. Our operative mortality, defined as death with in 30 days or during the same hospitalization, was 24% twenty seven of 37 patients (72.9%) were discharged from the hospital at a mean of 21 days (± 25 days; range, 6-194 days). Cause of death included multisystem organ failure ($n=3$), low cardiac output ($n=3$), cardiac arrest ($n=2$), stroke ($n=1$), and sepsis ($n=1$) of sternal closure.

Conclusions: DSC is a safe and sample method for treating bleeding, arrhythmia, and myocardial edema following on pump cardiovascular surgery.

CP105

CORONARY ARTERY FISTULAS; OUR EXPERIENCE

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Objectives: Coronary artery fistula is an infrequent abnormality. The incidence of coronary artery fistula in the overall population is estimated to be 0.002%. Coronary fistula is an incidental finding in 0.3%-0.8% of patients who undergo diagnostic coronary angiography. We present our five patients with coronary artery fistula who have relatively older ages. One patient with isolated coronary artery fistula and four patients with coronary artery fistula and with other cardiac diseases were included in this study.

Methods: Between March 1998 and November 2007, five patients incidentally diagnosed as having coronary artery fistulae by cardiac catheterisation. One patient was asymptomatic while four patients presented with signs of cardiac failure with cardiac valve diseases. One patient had severe mitral valve disease, one patient had aortic valve disease and other two patients had coronary artery disease. All of the patients were operated under cardiopulmonary bypass. Surgery was performed through a median sternotomy.

Results: The median patient age was 40.6 years (range: 27-52 years). They were two female and three male. Coronary fistulations origin and drainage and surgical procedures, performed on five patients

Patients	CAF (inflow)	CAF (outflow)	Surgical procedure
1	RCA	RA	MVR+Lg and Tr.
2	LAD	RV	CABG+Lg and Tr.
3	RCA, Cx	RPA, LPA	AVR+Lg and Tr.
4	Cx	PA	CABG+Lg and Tr.
5	LAD	CS	Lg and Tr.

CAF; Coronary artery fistulae, RCA: Right coronary artery, LAD: Left anterior descending, LMCA: Left main coronary artery, Cx: Circumphlex artery, PA: Pulmonar artery, RPA: Right pulmonary artery, LPA: Left pulmonary artery, MVR: Mitral valve replacement, AVR: Aort valve replacement, CABG: Coronary artery bypass grafting, Lg and Tr: Ligation and Transfixion, CS: Coronary sinus.

Conclusions: In this study, surgical closure of CAF proves to be technically safe and easy, especially in the presence of additional cardiac pathology. If the percutaneous closure for CAF is unsuccessful surgery is the reasonable next option.

CP106

CHOICE OF CORONARY ARTERY BYPASS GRAFT MATERIAL IN PATIENTS OVER 70-YEARS-OLD

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Objectives: Increased life expectancy has led to a growing elderly population frequently presenting with coronary heart disease and necessity of CABG. With increasing age also grow number of comorbidities, diffuse atherosclerosis and vein varicosis. This sometimes lead to difficulties of graft material choice for CABG operations and possible complications.

Methods: In year 2007 in our center were performed 205 isolated CABG operations in patients over 70-year-old (18% from all-1136 operations). Patients age were from 70 to 86 years. Gender ratio male and female were 126:79. LVEF varied from 25 to 75%, mean 52%. Extracardial atherosclerosis was observed in 75% of patients. Vein varicosity or unsuitable quality of vein for bypass grafts were observed in 50% of patients. Mean operative risk predicted by EuroSCORE was 6.5%, EuroSCORE points ranging from 3 to 9. Altogether were performed 722 bypass grafts in 205 patients, mean number of grafts-3.5 per patient. The main graft material was vs. saphena, used in 502 (69.5%) grafts, 59 from them sequential. LIMA was used in 191, RIMA in eight cases. Radial artery was used for 10 (4.9%) grafts.

Results: Overall operative mortality was 2.4% - 5 patients. Causes of death were: one thrombosis of mesenteric artery and four myocard infarctions with fatal heart failure. In two patients of them were observed graft thrombosis (1 vs. saphena and 1 LIMA). Altogether were 13 reoperations: 10 patients according to bleeding (2 surgical bleedings from bypass grafts), 1 emergency reoperation due to acute heart failure, 2 patients required reexploration due to sternum osteomyelitis and deep wound infection (1 patient from them after both IMA grafting). Dehiscence of sternum wound occurred in four patients.

Conclusions: CABG in elderly proved to be quite safe method of treatment-overall operative mortality (2.4%) turned out less than predicted by EuroSCORE (6.5%). The use of arterial bypass grafts does not increase post-operative mortality and morbidity. Using LIMA as a graft to LAD should be a gold standard. We suggest that in future more arterial bypass grafts should be used to improve midterm and longterm results.

CP107

MYOCARDIAL BRIDGING

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Objectives: Myocardial bridging was first described in 1737 by Reyman and is actually known to occur in 1/3 of general population. It is usually a benign condition but has also been associated with dangerous complications. Recent studies have lead to a better understanding of the physiopathologic mechanisms involved in those complications.

Methods: On the base of a literature review: anatomy, physiology, clinical relevance and treatment of this condition is presented.

Results: Myocardial bridging is characterized by a segment of a major epicardial coronary artery having an intramyocardial course (frequently median portion of the anterior descendent coronary artery) leading to a systolic and sometimes also diastolic compression of the involved vessel. This situation is clinically silent in the vast majority of cases but has also been associated with ischemia, arrhythmias, ventricular dysfunction, sudden death. Different mechanisms have been related to those associations: diastolic relaxation delay, reduced coronary flow reserve, endothelial dysfunction, vascular spasm. Angiography has been considered the gold standard for diagnosis but recent imagiologic techniques may also have an important future impact for diagnosis. Medical and surgical therapies have been proposed for a better quality of life in subjects having myocardial bridging.

Conclusions: Although usually a benign condition myocardial bridging is an underdiagnosed condition, and (among other things) may be associated with ischemia in low risk patients for coronary artery disease. Recent imagiologic tools may lead to a better identification and functional quantification of this situation, which is important regarding the creation of diagnostic and therapeutic guidelines.

CP108

INTERLEUKIN-6 ACTIVITY BEFORE AND AFTER REMOVAL OF A RARE CARDIAC LYMPHOMA

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Objectives: Interleukin 6 (IL-6), originally established as one of the B cell stimulatory factors, has multiple biological functions, and also may be associated with the physiopathology of some diseases, such as cardiac myxoma. A rare case of B-cell cardiac lymphoma with mediastinal lymphadenopathy is reported.

Methods: Preoperative echo showed a large mass in left and right atria with partial obstruction of the tricuspid valve and SVC, with a typical aspect of a biatrial myxoma. Right atrium was incised parallelly to atrioventricular groove and septum was opened superiorly and excised completely together with a large portion of left atrium. The mass was took off carefully. Right atrium was removed near totally. Reconstruction was obtained with bovine pericardium for right atrium and autologous pericardium for the left atrium. The patient had a standard postoperative course and was discharged after one week with a reduction of dyspnea (NYHA I-II) and no fever.

Results: A 5 ml sample of blood was obtained from the patients before intervention, 24 and 48 h after the surgery. The plasma concentration of IL6 was determined by an enzyme-linked immunosorbent assay method. Compared with the mean IL6 plasma levels of five healthy controls (2.1 ± 0.4 pg/ml), the patient had an elevated plasma level of IL6 before the intervention (91.1 pg/ml). This value rapidly decreased 24 and 48 h after the operation (24 h after 46.7 pg/ml; 48 h after 36.1 pg/ml), suggesting at least a partial involvement of the cardiac lymphoma in the IL6 production. The conclusion is that laboratory examinations revealed high level of IL-6 preoperatively and a decrease of it immediately after the removal of the tumor. These findings suggest that probably this cytokine was produced by the cardiac mass.

Conclusions: Recently, IL6 was demonstrated to have numerous biological functions, including stimulation and differentiation of lymphocytes. In cardiac mixoma the reduction of IL6 after mass removal demonstrates that it was produced by the tumor and was partially guilty of the symptoms suffered by the patients (fever, fatigue, asthenia). We found a similar behaviour in this case with a reduction of fatigue (NYHA I-II) and normalization of body temperature at two days after the operation. All these data confirm the importance of these factors in determining the clinical manifestations in cardiac tumors, not only in myxoma but also in malignant ones. Further studies are needed to give statistic relevance of this observation but the rarity of the pathology makes it difficult.

CP109

RE-COARCTATION OF THE THORACIC AORTA AND ANEURYSM OF THE ABDOMINAL AORTA - A SURGICAL CHALLENGE

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Objectives: Coarctation of the aorta is a congenital disease of unknown etiology with surgical or endovascular treatment options. It is commonly associated with acquired aorta pathology that may require surgical intervention. In addition, 5%-30% of patients with previous coarctation repair have re-coarctation. Adult patients with complex forms of descending aortic disease and re-coarctation remain a surgical challenge and have a high risk of postoperative mortality and morbidity. There is no consensus on the optimal approach for these patients.

Methods: We report a case of a 46-year-old male who was referred to our center due to re-coarctation of the aorta (patch aortoplasty performed 18 years ago), abdominal aortic aneurysm and right common iliac artery occlusion. Re-coarctation segment was long, with a pseudoaneurysm and a concomitant hypoplasia of the aortic arch.

Results: In a first surgical approach, the patient was submitted to a median sternotomy and after aortic and right atrial cannulation, normothermic cardiopulmonary bypass was established. Cephalad retraction of the heart and longitudinal pericardial incision directly over the descending thoracic aorta allowed exposure of the aorta through the posterior pericardium. The aorta was dissected to allow placement of a partially occluding vascular clamp. This was used to control the descending aorta, and the end-to-side Dacron graft-to-aorta anastomosis was made with continuous 4-0 polypropylene. The graft was led around the the left margin of the heart and anastomosed to the left lateral aspect of the ascending aorta by using a side-biting clamp. In a second surgical approach, the patient was submitted to a laparotomy for an aneurysmectomy and an aorto-bifemoral bypass.

Conclusions: Recurrent coarctation may be difficult to manage, mostly when other comorbidities are present. When the re-coarctation is associated to aortic calcifications and/or hypoplasia, endovascular treatment is inefficient; on the other hand, re-operation most of the times entails cardio-pulmonary bypass and aortic clamping, with the subsequent increased

risks of bleeding, spinal lesion and paraplegia. Extra-anatomic ascending-to-descending aortic bypass however, does not need local dissection of the coarctation or aortic arch, aortic clamping or cardiac arrest and yields excellent short- and mid-term results. This technique is the 'gold standard' in some centers.

CP110

RELATIONSHIP BETWEEN ACUTE REJECTION IN ENDOMYOCARDIAL BIOPSIES AND LEVELS OF PLASMATIC ANTIOXIDANTS IN HEART TRANSPLANTED PATIENTS

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Objectives: The aim of this study was the evaluation of the blood reduction-oxidation potential in heart transplanted patients at risk for acute rejection

Methods: 5 ml of peripheral heparinated blood venous sample were obtained concomitantly with subsequent endomyocardial rejection surveillance biopsies for 10 heart transplanted recipients, undergoing 110 biopsies in the first six months after transplantation. The biopsies were grouped according to the presence of low grade 0-2 ($n=92$) or rejection grade 3A ($n=18$) of the International Society of Heart and Lung Transplantation. After blood sample centrifugation, plasma was collected and stored at -30°C . Concentration of plasmatic antioxidants was measured using an Oxy adsorbent kit (Diacron srl, Grosseto, Italy). The plasma levels of this antioxidant barrier were compared in the two groups (3A grade vs. 0-2 grade rejection biopsies).

Results: Plasma barrier against oxidation was significantly decreased in the group of biopsies grade 3A vs. the group of low grade cellular rejection (249 ± 23 $\mu\text{mol HClO/ml}$ vs. $320 \pm \mu\text{mol HClO/ml}$, $P < 0.01$).

Conclusions: In heart transplanted patients low levels of plasmatic antioxidants were associated with acute cellular rejection. Further studies need to evaluate if plasma antioxidant levels determination may be useful to reduce the number of endomyocardial biopsies during the follow-up of these patients.

CP111

PREOPERATIVE BLOOD DONATION IS PREVENTING HOMOLOGOUS EXPOSURE IN ELECTIVE CARDIAC SURGERY

S. Alshammary, D. Bouchard
ICM Montreal, Canada

Objectives: The aim of this study is to assess the effect of autologous blood donation in the preparation for elective cardiac surgery on postoperative exposure to homologous blood products. Background: many methods have been used effectively in cardiac surgery to reduce the need for homologous transfusion such as reinfusions of shed mediastinal blood and use of pharmacological agents like the aprotinin but non of them had so far eliminated the need for homologous blood.

Methods: We prospectively studied 53 patients scheduled to undergo elective cardiac surgery (49 CABG, 1 Bentall, 1 Redo RVM, and 2 mitral valve repairs). They were randomized to preoperative blood donation OR not. Group (gr) 1 ($n=28$) donation group and group 2 ($n=25$) control group. All donation group were operated within max. 42 days from the 1st donation and from 6 to 36 days from the 2nd donations. Both group received aprotinin and had their shed mediastinal blood reinfusion. We assessed post-op variables especially their need for homologous blood products and their coagulation profile.

Results: Pre op variables and characteristics were similar for the two groups. Intraoperative variables and interventions for the two groups were also similar. Intra-op and post-op requirements for platelets group 1 (2 patients 7.1%) and group 2 (4 patients 16%), for FFP group 1 (1 patient 3.6%) and group 2 (5 patients 20%), for cryoprecipit group 1 (0 patient) and group 2 (1 patient 4%). Two patients of group one did not complete the donation because of worsening their angina only one of them donate one unit of RBCs. Only one patient of group one received homologous RBCs (3.6%) (He is one of the two patient who did not donate because of their angina) vs. six patients of group 2 (24%) they received homologous RBCs ($P < 0.04$). Fibrinogen level in group 1 (6.22) and group 2 (5.06) (P -value 0.0064). Also fibrinogen level in sub group of patients that received blood transfusions in group 1 and group 2 also showed significant differences ($P < 0.048$). No death or myocardial infarction occurred post op and coagulation profiles and other post-op variables are similar in the two groups.

Conclusions: Preoperative blood donations reduce significantly the need for perioperative homologous blood transfusion in elective cardiac surgery.

CP112

LONG-TERM OUTCOME AFTER CORONARY ENDARTERECTOMY IN PATIENTS UNDERGOING COMBINED CORONARY AND VALVULAR SURGERY

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Objectives: Coronary Endarterectomy (CE) in patients undergoing coronary artery bypass graft (CABG) surgery has been shown to be beneficial in those with diffuse coronary artery disease. There are no published data on its role and benefit in patients undergoing more complex operations. We present our experience with CE in patients undergoing valve surgery with concomitant CABG.

Methods: Between 1989 and 2006, 237 patients underwent CABG with valve surgery under a single surgeon at our institution. Of these, 41 patients needed CE. Data was retrospectively obtained from hospital records and database. Further follow-up was obtained by telephone interview. All variables were analyzed by univariate analysis for significant factors relating to hospital mortality. Morbidity and long-term survival was also studied. There were 29 males and 12 females with a mean age of 67.4 ± 8.1 and body mass index of 26.3 ± 3.3. Their mean EuroSCORE was 7.6 ± 3.2 and the log EuroSCORE was 12.2 ± 16.1.

Results: Thirty-two patients were discharged from the intensive therapy unit within 48 h after surgery. Average hospital stay was 12.7 ± 10.43 days. Thirty day mortality was 9.8%. Six late deaths occurred during the 14 year follow-up. Ten year survival was 57.2% (95% CL 37.8-86.6%). Three of the survivors had Class II symptoms, with one requiring nitrates. None required further percutaneous or surgical intervention. We compared the result with the available mortality figure from the SCTs database.

Conclusions: Compared to the SCTs database for these patients we have observed that CE does not increase the mortality in combined procedures. By accomplishing revascularization in areas deemed ungraftable, we have shown an added survival benefit in this group of patients.

CP113

MINIMAL ACCESS CORONARY ARTERY BYPASS GRAFTING WITH CORONARY ENDARTERECTOMY

S. Kumar, R.U. Nair
 Yorkshire Heart Centre, Leeds General Infirmary, Leeds, UK

Objectives: Complete revascularization of a severely atheromatous coronary artery can be accomplished by endarterectomy in conjunction with coronary artery bypass grafting (CABG). The present study assesses safety and long-term efficacy of left anterior descending (LAD) coronary endarterectomy as an adjunct to minimal access CABG.

Methods: Between January 1988 and March 2006, of the 2888 CABG operation, 238 (8.2%) had endarterectomy of the LAD. The patients with no visible good distal LAD on the angiogram were subjected for this procedure. There were 195 (82%) males and 43 (18%) females with mean age of 61.5 (±9.1) and 64.1 (±7.9), respectively. Two hundred and three (85.3%) had history of myocardial infarction, 28 (11.7%) had unstable angina with a median EuroSCORE of 3 (0-11). Two hundred and twelve (89%) had triple vessel disease. Eighty percent were elective, 20% urgent or emergency operation and 4 (1.7%) were reoperations. Five (2.1%) required intraaortic balloon pump preoperatively. The median post-operative stay was five days (4-10).

Results: All underwent LAD endarterectomy with CABG to the LAD. The left internal mammary artery was grafted to the LAD in 228 (95.8%) and 9 (3.8%) had saphenous vein with mean number of grafts 3.29 (1-6). Concomitant valve procedures were performed in 12 (5%). Overall 30-day mortality was 13 (5.46%). Perioperative myocardial infarction in the LAD territory was 3%. One-year survival was 90% (95% CI, 90-97%), whereas 10-year survival was 63% (95% CI, 60-80%). Twelve re-angiogram, revealed all but one patent LIMA to LAD graft.

Conclusions: Complete revascularization of the diffusely diseased LAD artery can be accomplished by adjunctive endarterectomy with a mortality of 5.4%. It offers survival benefits and contributes to long-term graft patency. The minimal access approach reduced the postoperative hospital stay and was aesthetically pleasing to the patient.

CP114

SYMPTOMATIC GIANT FALSE ANEURYSM OF SAPHENOUS VEIN GRAFT AFTER CORONARY REVASCLARISATION

S. Kumar, R.W. White, P.H. Kay
 Yorkshire Heart Centre, Leeds General Infirmary, Leeds, UK

Objectives: Twenty-three years after an uncomplicated Coronary revascularisation, a 77 year-old man presented with progressive NYHA grade 2 dyspnoea. A transthoracic Echo revealed a large echogenic extracardiac mass between the liver and the right side of the heart. On serial annual MRI scans a significant enlargement of this mass with increasing cardiac compression (Figure 2). He underwent resection of false aneurysm of previous saphenous vein graft through redo-sternotomy (Figure 1).

CP115

PROSPECTIVE EVALUATION OF CARBOHYDRATE METABOLISM IN PATIENTS UNDERGOING ELECTIVE CORONARY ARTERY BYPASS GRAFTING

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Objectives: Disturbances of glucose metabolism are associated with increased risk of ischaemic heart disease (IHD). It is not uncommon that IHD and its complications precede diagnosis of glucose metabolism disturbances. The objective of the study was to evaluate prevalence of glucose balance disturbances in consecutive patients with stable IHD who underwent elective CABG procedures.

Methods: Prospective analysis of glucose metabolism was carried out on a group of 117 consecutive IHD patients (including 31 women) aged below 80 years, selected for elective CABG surgery. In all patients, history assessment and physical examination as well as basic biochemical studies and resting echocardiography were performed. Additionally, in all individuals without previous diagnosis of diabetes mellitus, oral glucose tolerance test (OGTT) was carried out.

Results: History analysis revealed glucose balance disturbances in 35 (29.9%) patients, including diabetes mellitus in 33 (28.2%) subjects and impaired glucose tolerance in 2 (1.7%) individuals. Based on OGTT results, among the remaining 82 (70.1%) subjects without previously known glucose metabolism disturbances 4 (3.4%) patients had abnormal fasting glycaemia, 32 (27.4%) subjects had impaired glucose tolerance, and diabetes mellitus was diagnosed in 12 (10.3%) individuals. No impaired glucose balance was found in only 34 (29.1%) examined subjects.

Conclusions: Over 70% of all patients undergoing elective CABG procedure presented various forms of carbohydrate metabolism disturbances that were not diagnosed previously. Thus, it seems that the assessment of glucose regulation should be mandatory in all patients undergoing elective CABG surgery.

CP116

BIVENTRICULAR REPAIR FOR RIGHT ATRIAL ISOMERISM ASSOCIATED WITH DORV, PS, LPSVC, HEMIAZYGOUS CONTINUATION OF INTERRUPTED IVC

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 Kartal Kosuyolu Heart and Research Center, Istanbul, Turkey

Objectives: Biventricular repair is usually hard to achieve in patient with right atrial isomerism associated with DORV, PS, LPSVC and hemiazygous continuation of Interrupted IVC.

Methods: Our patient was 4-years-old with right atrial isomerism underwent biventricular repair. He had a right atrial isomerism with large ASD and all the systemic and the pulmonary venous connections were opening left sided atrium. At about 13 months ago he had a Waterson shunt. At the follow-up period his pulmonary arteries enlarged and become to suitable levels (McGoon Ratio 1.8). He had two balanced ventricles with separated atrio-ventricular valves and outlet nonrestrictive VSD coupled with PS. He required intra-atrial baffle for rerouting pulmonary venous return to mitral valve and systemic venous return to tricuspid valve. An intraventricular channel was constructed between the morphologic LV and the aortic orifice using PTFE graft. RVOT reconstruction accomplished with resection of the infundibular muscle, pulmonary valvotomy and autologous pericardium was used for transannular patching

Results: He is in sinus ritm and free from the arrhythmias. According to the New York Heart Association he is in functional class I. At his postoperative echocardiography, only minimal mitral regurgitation was found.

Conclusions: In the majority of the right atrial isomerism cases, Fontan procedure could be the choice as a consequence of their anomalous structures. In particular circumstances such as in our case, biventricular repair is

an acceptable alternative to the Fontan procedure with suitable balanced ventricles.

CP117
PROPHYLACTIC PERITONEAL DIALYSIS AFTER TOTAL CORRECTION OF TETRALOGY OF FALLOT

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Kartal Kosuyolu Heart and Research Center, Istanbul, Turkey

Objectives: The intend of this study was to estimate the protective effect of peritoneal dialysis after cardiopulmonary bypass in corrections of Tetralogy of Fallot (TOF) (with a clinical state of high fever, decreased cardiac output and renal shut down (SIRS).

Methods: Seventeen consecutive children with TOF were randomly divided into a control group ($n=8$) and a protective group ($n=9$). In protective group we started peritoneal dialysis right after the surgery at the intensive care unit. At the control group peritoneal dialysis was not carried out. They were all cyanotic and their ages between 6 months to 19 months (9 ± 3.7 months) and weights around 6.7-12.4 kg (8 ± 5.9 kg), respectively. We performed the total correction procedure (VSD closure with interrupted Teflon pledged sutures through right ventriculotomy and right ventricle outflow reconstruction with gluteraldehyde treated pericardial patch) on all of them. The cross clamps and the cardiopulmonary bypass times were between 63-95 min (78 ± 14.37 min) and 81-134 min (97 ± 24.57 min) correspondingly. After the total correction, their right ventricle to aortic pressure ratio was below 0.7.

Results: The alveolar-arterial O_2 gradient were better preserved in the dialysed group than in undialysed one ($P<0.05$). In the protective group no patient went into this clinical state (high fever, decreased cardiac output and renal shut down). In the control group 3 out of 8 patient (37%) went into this clinical state. In these three patient, we began to continuous peritoneal dialysis from then on. In a very short time in two patient, we took under the control of SIRS state by means of dialysis. Gradually, arterial blood pressure went to higher level. Progressively, urinary output became to an admirable levels. We lost one patient in control group due to high fever, decreased cardiac output and renal shut down. The time of intensive care unit stay were shorter in the protective group (3.4 ± 6.1 days) compared with the control group (5.3 ± 7.9 min) ($P<0.05$).

Conclusions: After the total correction of TOF, the lung vascular endothelial cell injury may be the reason of the cardiopulmonary bypass-induced injury. Our clinical principal is to use peritoneal dialysis on every cyanotic patients to prevent SIRS after the ECC. We also thought that peritoneal dialysis in this clinical state (high fever, decreased cardiac output and renal shut down) is a life saving procedure.

CP118
AXILLARY ARTERY APPROACH FOR INSERTION OF AN INTRAAORTIC BALLOON PUMP CATHETER IN A PATIENT WITH SEVERE OCCLUSIVE AORTOILIAC DISEASE

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Bursa Yuksek Ihtisas Education and Research Hospital, Bursa, Turkey

Objectives: Transfemoral route for insertion of intra-aortic balloon pump (IABP) catheter for hemodynamic support is widely used in patients with postoperative cardiogenic shock by most cardiovascular surgeons. Nevertheless, this approach is not suitable in patients with severe occlusive aortoiliac disease. Axillary artery as alternative route is possible insertion site in this complicated cases.

Methods: We report a case of 69-year-old male patient who developed cardiogenic shock in the cardiac intensive care unit 6 h after successful off-pump coronary artery bypass surgery. He had severe stenotic coronary artery disease, severe occlusive aortoiliac disease, proximal stenosis of left subclavian artery of 40% and moderately depressed left ventricular dysfunction.

Results: The patient was hemodynamically stable with moderate doses of inotropes during perioperative period. Six hours later, he had hemodynamic deterioration and cardiogenic shock. Emergent IABP catheter insertion was easily performed through the right axillary artery. Duration of IABP support was three days. No neurovascular complications occurred. The patient had smooth recovery and IABP was removed successfully.

Conclusions: The axillary artery may be used as an alternative site for access in those settings in which severe aortoiliac occlusive disease and aortic aneurysmal disease hinder percutaneous femoral IABP catheter placement.

CP119
CYTOKINE REDUCTION BY AUTOTRANSFUSION DEVICES DURING CARDIAC SURGERY

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Department of Surgery and Bioengineering, University of Siena, Italy

Objectives: Intraoperative autotransfusion using a cell-saving device is a standard approach to augment blood conservation. Minimized extracorporeal circuits and the avoidance of cardiomy suction may result in additional benefit. The effect of red cell washing on inflammatory mediators has not been fully investigated. Aim of our study was to compare the ability of two cell-saving devices in decreasing Tumor Necrosis Factor alpha (TNF), Interleukin 6 (IL6), Interleukin 8 (IL8) and Myeloperoxidase (MPO) in the autotransfused blood.

Methods: Twelve high-risk patients undergoing cardiac surgery were randomized into two groups: autotransfusion by the Cell Saver five and by the Cardiopat system (Haemonetics Corporation, Braintree, MA, USA). At completion of cardiopulmonary bypass the circuit blood was sampled and then processed; additional samples were collected from the washed red cells and from the discharge fluid. Cytokines levels were tested by an enzyme linked immunosorbent assay (ELISA) test, using the Biosource sandwich ELISA kit (Biosource International, Camarillo, CA, USA).

Results: Cytokines were significantly removed by the two cell-saving devices. The Cardiopat system was more efficient in TNF and IL6 elimination (TNF: 2.1 ± 0.1 ng vs. 9.4 ± 0.5 ng, $P<0.01$. IL6: 6.5 ± 0.9 ng vs. 16.8 ± 2.5 ng, $P<0.01$). No significant difference between the two systems was found in IL8 and MPO removal.

Conclusions: Red-cell processing by autotransfusion devices may contribute to the attenuation of the inflammatory response during cardiac surgery, even if cytokine removal depends on different mediators. The Cardiopat appears more effective than the Cell Saver five on TNF and IL6.

April 24th-25th-26th, 2008

8:00-18:00

Vascular Posters

VP1

ANALYSIS OF INTRASAC PRESSURE AFTER THE IMPLANTATION OF ENDOPROSTHESIS WIDTH OF DIFFERENT DIAMETERS, IN AN ANIMAL MODEL OF ABDOMINAL AORTA ANEURYSMC. Vaquero¹, R. Martinez², E.S. Norberto¹, A. Alvarez-Barcia¹¹Faculty of Medicine Valladolid, Spain; ²Faculty of Medicine Canarias, Spain

Objectives: The effect of a plain 48-wire self-expanding flexible stent (Wallgraft Boston Scientific) on abdominal aortic aneurysms has been studied in a new animal model. We performed this study in order to analyze the mechanical properties of bare-metal Wallgraft® endoprosthesis to investigate their responses to hemodynamic forces.

Methods: Aneurysms were created by interposing fusiform segments of PTFE into the infrarenal aortas of 12 Large White pigs. The pigs were assessed after two weeks by telemetry pressure, ultrasonography and arteriography methods. Endovascular placement of the stents, two weeks after aneurysm creation, was performed under arteriographic control in the half of pigs (Second group of study). These pigs were assessed by telemetry pressure, ultrasonography and arteriography methods, weekly after stenting; they were then sacrificed for pathological examination.

Results: At six weeks the aneurysms in the first group were pulsatile with partial endothelialisation and no mural thrombus. Placement of the stent of different size in the second group was accomplished easily. Stenting resulted in an immediate reduction in wall pulsatility of all aneurysms and thrombosis of the excluded aneurysm sac occurred in three cases. In the other three cases the pulse pressure in the sac was reduced. In all cases there was a significant reduction in maximum aneurysm diameter when measured weekly after stenting.

Conclusions: A pulsatile, non-thrombogenic aortic aneurysm model approaching human dimensions has been successfully developed for the study of endoprosthesis prior to their clinical use. Endovascular placement of a plain, multiple-wire Wallgraft was associated with reductions in aneurysm pulsatility, pulse pressure within the sac and maximum aneurysm diameter over the study period. Stenting was associated with thrombosis of the excluded aneurysm sac in 50% of cases.

VP2

HISTOLOGICAL STUDY OF THE AORTA WALL AFTER THE IMPLANTATION OF SENSORS FOR EVALUATION OF INTRASAC PRESSURE IN THE ABDOMINAL AORTIC ANEURYSMC. Vaquero¹, R. Martinez², E.S. Norberto¹, J. Agudo¹, A. Alvarez-Barcia¹¹Faculty of Medicine of Valladolid, Spain; ²Faculty of Medicine of La Laguna, Spain

Objectives: To evaluate the histological changes after the implantation of a sensor for study of the intrasac pressure in a model of the abdominal aorta aneurysm in the pig.

Methods: Ten mini-pigs were utilized. The study is performed after the creation artificial aneurysm in the abdominal aorta with the implantation a sensor pressure for telemetry in the sac between the arterial wall and the endoprosthesis implanted. A histological analysis of the arterial wall for evaluation of changes in the layers induced for the sensor. To perform the histopathology study, the kidneys were fixed in formal, embedded in paraffin and sliced along their axis with the microtome in 6-µm thicknesses. After deparaffinating the sections, the samples were stained with hematoxylin-eosin. The histopathology study was performed using a light microscope.

Results: The results of the study show myointimal hyperplasia following implantation of sensor for pressure evaluation in aneurysm sac after the endovascular repair.

Conclusions: The experimental results indicate that for all the sensor-wire configurations tested, the presence of sensor had a minimal effect on the arterial wall of aorta. At present there is no reliable basis on which to evaluate susceptibility to rupture of a particular abdominal aortic aneurysm. AAA rupture is a biomechanical phenomenon that occurs when the stress within the aneurysm wall exceeds the tensile strength of the wall.

VP3

VOLUMETRY STUDY OF THE ABDOMINAL ANEURYSM SAC THROMBUS IN PATIENT ELECTED AND RUPTURE TREATEDC. Vaquero¹, R. Martinez², E.S. Norberto¹, V. Gutierrez¹, L.D. Rio¹, J.A. González¹¹University Hospital of Valladolid, Spain; ²University Hospital of Canarias, Spain

Objectives: The authors have a study for evaluated the repercussion of different volumetry of the thrombus sac of the abdominal aneurysm in two groups of patient treated in situation of elected and ruptured. The authors think there are differences between the groups for the different comportment of the pressure in the sac with different form and size for the transmission of the forces of rupture in the structure of the thrombus.

Methods: On make the study in the 200 patient, 100 of the ruptured and 100 of the effected treated group. All patient have a TC study with slides of 3 mm of diameter and with the measures of the thrombus sac with a morphometric, planimetry reconstruction have the meditation of volumetry of the thrombus and reconstructions. A comparative estadistic study is realized and the results are analyzed were on constated what the size of the thrombus have different evolution in relation of the thin thrombus have same probabilities of rupture of the large.

Results: The analysis of the data show mean measures of 3.4±1.2 in elected treated aneurysm of the diameter of the thrombus vs. 5.7±2.1 (P<0.01) of the other group. The area of 6.8±2.7 in elected treated group vs. 8.5±3.1 in other group with P<0.01. Others morphometry parameters are analyzed with the general results of an increase of the ruptured group in comparison with elected group.

Conclusions: The size it is important date for the prevision of the evolution with that large thrombus have a high probabilities of rupture. It is possible the prevision of rupture with an analysis of the thrombus scan analyzed with planimetry and volumetry.

VP4

COMPARATIVE STUDY BETWEEN THE INDICATIONS, DEVICES AND RESULTS IN TREATMENT ENDOVASCULAR OF THE ABDOMINAL AORTA ANEURYSM

V. Carlos, G. Vicente, G.J. Antonio, S.N. Enrique, D.R. Lourdes

University Hospital of Valladolid, Spain

Objectives: The treatment of endovascular of aneurysm of abdominal aorta has come evaluating considering the obtained results and the complications that have been derived. Multiple parameters have been analyzed and very specially the related one to the morphology of the aneurysm. The authors make an evaluation of the results obtained after the treatment to endovascular of the aneurysm of abdominal aorta. The objective of presents/displays work is to analyze the results obtained in relation to the used device and the technical indications followed in our selection patients.

Methods: Two hundred and fifty-six aneurysms treated by means of the technique are analyzed to endovascular. After the generic indication of treatment to endovascular has valued the aneurism morphologically and the device considered more adapted between the available ones in the market has been indicated. The pursuit has been made to the month, three months, six months and to the year, being the later valuations annually, according to the standard protocols of valuation with ultrasounds and TAC. Twenty-one endoprosthesis Aneurix, 210 have been implanted Talent, 1 Endologic, 17 Ancure of EVT, 27 Lifepath, 13 Cook and 11 Excluder de Gore. One hundred and ninety-seven have been branched off endoprosthesis and 41 mono iliacs.

Results: In our experience the selection of the device for the treatment of the divers forms of the aneurysms, show the better case for the size, tortuosity, angulations and situations of the branches arteries is made with the Ancure, Lifepath and Excluder devices. The worst cases are treated with Cook and Talent devices.

Conclusions: Discussion the criteria of selection of the graft, the anatomical considerations, the used devices and the obtained results are valued. There is a selection to selection of devices for treatment of different cases. The cases with a special difficult area treated with Talent and Cook endoprosthesis.

VP5

TRANSMISSION OF PRESSURE EVALUATION THROUGH THE ANEURYSMATIC THROMBUS AFTER ENDOVASCULAR ANEURYSM REPAIR. EXPERIMENTAL STUDY IN THE PIGV. Carlos¹, N. Felix³, M. Rafael², A. Javier¹, A.-B. Angel¹, G. Carmen¹¹Faculty of Medicine of Valladolid, Spain; ²Cardiovascular Institute of Canarias, Spain; ³High School of Engineers of Valladolid, Spain

Objectives: This study was undertaken to determinate the relationship of intrathrombus and intrasac pressure after endovascular abdominal repair in vivo porcine model.

Methods: Sixteen male pigs underwent creation of an infrarenal aortic aneurysm, with a Dura patch with preservation of lumbar branches. An indwelling pressure transducer was placed in the aneurysm sac. After four weeks the animals underwent EVAR with a custom-made Wall-graft endograft and provoked the thrombosis of aneurysm sac for electrocoagulation. Aneurysm sac pressure was measured in awake animals in four weeks in three months for evaluation in acute and chronic situation with fresh and organized thrombus.

Results: All twelve animals underwent successful creation of an aortic aneurysm and EVAR resulting in exclusion of the aneurysm sac. Our results show that an increase in sac with thrombus. The thrombus have a increase in volumen.

Conclusions: The thrombus fresh transmitted the pressure in the aneurysm endovascular treated sac. But the thrombus well-organized have a less increase of the presson.

VP6

DISSECTION OF ABDOMINAL AORTA - A CASE REPORT

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Objectives: Aortic dissection occurs when layers of the aortic wall separate as a result of extra luminal cavity of blood through an intimal tear. This process commonly involves the thoracic aorta. Dissection limited to the abdominal aorta is rare especially when the dissection limited to infrarenal segment. Surgical intervention has been proposed in the acute phase of infrarenal dissection, whereas antihypertensive therapy is recommended when the dissection extends from subclavian artery to abdominal aorta (suprarenal segment) without rupture or major branch obstruction. Unfortunately, the appropriate management of dissecting aneurysm of abdominal aorta has not documented previously.

Methods: A 43-year-old man was admitted to alzahra hospital in Isfahan with sudden onset periumbilical abdominal pain from one week before admission. In the evaluation, spiral CT scan with intravenous contrast confirmed infrarenal type of abdominal dissection of aorta with extension to right common iliac artery.

Results: Laparotomy was performed and aorta was repaired with anastomosis of left common iliac and right femoral artery using bifurcate collagen coated Dacron graft.

Conclusions: Surgical intervention with using synthetic graft is recommended in patients with dissecting aortic aneurysm of infrarenal segments where the extent of dissection is limited and accessible. Computed tomography would be useful in diagnosis and follow-up.

VP7

ABDOMINAL AORTIC ANEURYSMECTOMY IN RENAL TRANSPLANT RECIPIENTS

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Objectives: The abdominal aortic aneurysm (AAA) prevalence in patients with renal transplant is 1.01%, with a development in younger subjects and with a faster enlargement, suggesting that hemodialysis length, hypertension and steroid therapy may play a role. The aortic clamp during the AAA repair may cause renal damage if the warm ischemia time of the allograft is >60 min, so divers procedures have been performed to preservation the renal function:

The renal oxygen consumption is reduced to 15% in hypothermia at 20 °C. Perfusion with a 4 °C solution reduces the cortical temperature to 13 °C in 5 min, and allows approximately 2 h of reversible ischemia. Externally, the kidneys are also packed with ice. Temporary shunts are performed from the axillary artery or from the abdominal aorta above the aneurysm to the iliac or femoral vessels. These procedures entails the risk of distal arterial dissection or embolization and may increase the risk of haemorrhagic or infectious complications. The technique of ex vivo renal perfusion has been abandoned. Renal perfusion with a cardiopulmonary bypass by cannulation of femoral artery and vein is also low used. Advantages of the endovascular repair are the avoidance of graft ischemia during the aortic cross-clamping, less systemic complica-

tions, and consistent reduction in ICU stay. Disadvantages are the need for a large quantity of contrast media and possible damage at the graft anastomotic site. We report our experience in the management of these patients.

Methods: In the last two years two AAA were detected in renal transplant recipients. The cases are a 47 and a 63-year-old men that had both a right-sided renal transplantation three years earlier. A 5.5-cm and a 5.8-cm AAA were confirmed by CT. Resection of the aneurysms were performed and aorto-aortic grafts were inserted. Cold perfusion with heparinized 4 °C ringer lactate and local hypothermia with sterile ice were used.

Results: Renal function did not change after the operation (preoperative serum creatinine level were 1.56 and 2.18 mg/dl; postoperative 1.74 and 2.19 mg/dl, respectively). The two patients are doing well, with good graft functioning after a follow-up of 1.5 and two years, respectively.

Conclusions: Open surgery without adjunctive shunts or bypasses remains a viable treatment for these patients. Renal ischemia during aortic cross-clamping can be reduced by cold graft perfusion and local hypothermia. We thought that the endovascular technique should be reserved for patients who meet the anatomical criteria and are at high risk for a conventional operation.

VP8

ANATOMICAL BRANCHED VASCULAR PROSTHESIS IN THE SURGICAL TREATMENT OF THE THORACOABDOMINAL AORTA: OUR INITIAL EXPERIENCE

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Objectives: The thoracoabdominal extension of the surgical aortic pathology (including both primary atherosclerotic aneurysms and pseudoaneurysms based on previous dissections) represents the major challenge for vascular surgeon. During reconstructive vascular procedure and aortic crossclamping, adequate perfusion of the spinal cord, liver, kidneys, gut etc. should be maintained. The till recently most widely used Crawford's inclusion technique consists in the vascular prosthesis inlay within the aneurysmal sac. Oxygenated blood supply to the feeding branches below the aortic crossclamp is usually provided by atriopulmonary bypass and intraluminally placed perfusing catheters. The original arterial ostia are, some in shape of common patches, connected with the corresponding holes excised from the graft's sides. However, at the longer term follow-up, the visceral patch aneurysms can develop due to the incomplete radicality during the original aortic aneurysmal replacement.

Methods: During 2007, the anatomical branched Coselli Thoracoabdominal Graft (Vascutek, Inchinnan, Scotland, UK) was used in four patients at our institution. These were three men and one woman, of the average age of 52 years (34-62). The two true thoracoabdominal aneurysms (TAAA) and two postdissection TAAA were diagnosed. In two patients, previous ascending aorta and arch procedures including the elephant trunk technique were used, both for the previous A dissection and distal extension in Marfan syndrome and a true aneurysm. In other two, either progressive dilatation of the previously untreated B dissection or the diaphragmatic aortic segment aneurysm following the previous TAAA IV resection were present. In all, TAAA resection and replacement with the Coselli graft was performed, with the use of atriopulmonary bypass, selective visceral perfusion and the common techniques preventing the spinal cord ischaemia.

Results: Three patients survived the procedure and were discharged from the hospital, one patient was lost shortly after the operation due to the visceral malperfusion. The mean surgery duration was 7 h (4.30-9), m.blood loss 18.3 l (m. 13.5 l recuperated), mean ICU stay in survivors 28 days (10-53), mean hospital stay 42 days (21-76). No paraplegia occurred in survivors. In one, tracheotomy and prolonged artificial ventilation were inevitable and certain degree of pulmonary dysfunction occurred in all patients surviving operation.

Conclusions: The concept and introduction of the Coselli Thoracoabdominal Graft with prewired integral side branches eliminates the risk of aneurysmal patch formation and offers more radical approach for the surgical treatment of the thoracoabdominal aortic aneurysms including the complex and most challenging postdissection cases. The authors' initial experience is herewith introduced.

VP9

**TREATMENT OF TYPE III ENDOLEAK BY ENDOVASCULAR TECHNIQUE
THREE CASES**

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Objectives: We present three patients with Infrarenal Abdominal Aortic Aneurysm (AAA), who underwent endovascular repair. Type III endoleak was detected on follow-up period.

Methods: All the patients were males and had a symptomatic aneurysm considered suitable for endoluminal therapy. Case 1: A 59 year-old patient with a 6.2 cm of diameter AAA was treated with a Lifepath (Edwards) bifurcated stent graft. A type I endoleak was detected at one month follow-up, and was successfully treated by a Zenith (Cook) proximal extension. After four years, a type III endoleak was observed on a CT-scan, because of distal migration of the previous bifurcated graft. A Talent (Medtronic) aorto-uniliac prosthesis was implanted, with contralateral iliac occlusion and femoro-femoral bypass. The leak was corrected. Case 2: A Zenith (Cook) bifurcated endoprosthesis was implanted in a 80 year-old patient who had a 6 cm of diameter AAA. After five years, disconnection and distal migration of both iliac grafts was observed on a CT-scan. The type III endoleak was successfully treated with bilateral iliac extensions. Case 3: A 78 years-old patient with a 6.3 cm of diameter symptomatic AAA underwent endovascular repair with a Zenith (Cook) bifurcated graft. At two years follow-up, a Thoracic Aneurysm and a type III endoleak at iliac gap were detected. The thoracic aneurysm was treated with a Relay (Bolton Medical) stent graft prosthesis and the leak was sealed with an iliac extension.

Results: The three cases with type III endoleak were repaired satisfactory with endovascular technic.

Conclusions: Type III endoleaks are less common than others, but when detected, they must be treated because the risk of aneurysm rupture is highly increased. The endovascular approach appears to be the treatment of choice with satisfactory results.

VP10

OUR OPERATIVE PROCEDURES IN OUR INFRARENAL ABDOMINAL AORTIC ANEURYSM CASES

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Objectives: Continuous advances in the surgical, anesthetic, and intensive care techniques, the outcome of elective open AAA repair has improved constantly. Decline in rates of morbidity and mortality is associated with early diagnosis, treatment of coexisting diseases, advancements in surgical techniques and experience in follow-up in the postoperative intensive care unite.

Methods: Sixty-six patients who had infrarenal AAA were operated in our clinic between the dates March, 2001 and November, 2007. Forty-five patient underwent elective operation. Urgent procedures were necessary for 21 patients because of ruptured aneurysms.

Results: We performed aortobiliac bypass graft to 33 (50%) patients, aortobifemoral bypass graft to 18 (27.2%) patients, aorto-aortic bypass graft to 10 (15.2%) patients, aortoiliac/femoral bypass graft to 5 (7.5%) patients. There wasn't any death in follow-up period. The overall survival rate was 87.9%. This rate was 95.6% in the patients who had operated due to non-ruptured AAA, 72% in the patients who had operated due to ruptured AAA.

Conclusions: AAA repair can be performed at low rates of morbidity and mortality.

VP11

THORACIC ENDOVASCULAR SURGERY FOR THE TREATMENT OF TRAUMATIC AORTIC RUPTURE

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Objectives: Traumatic aortic rupture (TAR) leads to immediate death in 75 to 90% of cases requiring mandatory surgical treatment. Despite improvements

on perioperative care and surgical techniques, conventional surgery for TAR still carries substantial risk of serious complications and mortality. Thoracic endovascular aortic repair (TEVAR) has emerged as a valid alternative to open surgical treatment.

Methods: From March 2001 to June 2006, 70 patients underwent TEVAR: seven patients (10.0%) had a TAR after road accident. The age ranged from 19 to 82 years. To evaluate the risk we follow: 1) the Glasgow Coma Score (GCS) in patients with head trauma; 2) the Injury Severity Score (ISS) in patients with multiple injuries; 3) the American Society of Anesthesiologist classification (ASA class) to describe the perioperative physical status. Five patients (71.4%) showed an unstable clinical picture (ISS>40; ASA class>3); head injury (with stupor or coma) was present in three patients (GCS=12); multitrauma with leg, arm and/or vertebral fractures occurred in 4 (57.1%) and abdominal blunt trauma in 4 (57.1%), complicated by haemorrhagic shock, previously treated by splenectomy, in one (14.3%). The first patient, affected by a pseudoaneurysm complicated by dysphonia, had a delayed TEVAR after one month from the trauma; the remaining six patients required an emergency TEVAR. The stent-graft was delivered in the catheterization laboratory under general anaesthesia with controlled hypotension. Implant strategy was selected on the basis of aortic morphology and vascular access. Two different stent-grafts were implanted: 8 Talent in 6 patients and 2 Gore in 1. Criteria for successful deployment included absence of death or surgical conversion, and exclusion of transected tract.

Results: There were no operative death and surgical conversion. Any neurological complication, including paraplegia, was observed. Right common iliac artery laceration due to the stent-graft discrepancy, occurred, treated by rescue prosthetic ileofemoral bypass. Two patients required prolonged mechanical ventilation and temporary haemodialysis. The intraoperative angiography and discharge CT-scan showed absence of endoleaks. At follow-up (12-63 months), a patient showed a late type I endoleak, treated by secondary TEVAR.

Conclusions: TEVAR is a safe procedure in TAR patients, mostly in instable/emergent conditions. Moreover, TEVAR allows for prompt treatment of associated lesions in complex multitrauma patients. TEVAR could be considered as an hypothetical bridge to open surgery in case of late failure of the stent-graft. Finally, trauma centers should have thoracic endovascular grafts available for optimal patient care.

VP12

DEBRANCHING OF EPIAORTIC VESSELS FOR THE TREATMENT OF TYPE-B AORTIC DISSECTION INVOLVING THE ARCH

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Objectives: Conventional surgery of type-B aortic dissection (B-AD) involving the arch is still hampered by consistent risk of mortality and neurologic complications. Thoracic endovascular stent-graft repair (TEVAR) required a preventive revascularization of epiaortic vessels to allow the aortic arch coverage. Here we report our experience with two patients in the hybrid treatment for B-AD involving the arch.

Methods: Patient n. 1: a 56-year-old man was admitted for an acute B-AD involving the distal arch, left subclavian artery (LSA), visceral vessels, and the abdominal aorta up to both common iliac arteries, with a small ascending aortic aneurysm. An emergency surgical option was considered because of the substantial risk of impending rupture, highlighted by the persistence of chest pain and unresponsive hypertension. Our strategy consisted of a simultaneous hybrid treatment: to achieve an adequate proximal landing zone, under local anesthesia, a prosthetic bypass graft between the right and left common carotid arteries was accomplished and TEVAR from origin of brachiocephalic artery, with oversteering of the left carotid and subclavian arteries, to the celiac axis was thereafter performed. Patient 2: A 51-year-old man, previously treated for B-AD with TEVAR, was admitted because of a presence of a proximal type-I endoleak with retrograde dissection of aortic arch. Simultaneous hybrid treatment was planned: under general anesthesia, the preventive revascularization of the epiaortic vessels were performed by a bifurcated prosthetic bypass from the ascending aorta to the both common carotid arteries and to left subclavian artery. TEVAR was thereafter performed from the ascending aorta, distally to origin of the prosthetic graft, to the descending aorta, covering brachiocephalic, left common carotid and subclavian arteries.

Results: No death, steal phenomena, left arm ischemia, or cerebrovascular accident occurred. The patients were discharged on the fifth and seventh postoperative day, respectively. At nine and six months follow-up, respectively, both patients did well and the computed tomographic scan confirmed patency of the prosthetic bypass grafts and complete thromboexclusion of the false lumen.

Conclusions: This less invasive technique, avoiding conventional high risk surgery and cardiopulmonary bypass, allows surgical treatment for greater number of patients with severe thoracic aortic disease. TEVAR major challenges are related to the conformability and durability of the current generation of endografts: short- and mid-term outcomes after endografting B-AD are encouraging. However, this hybrid approach does not preclude the possibility of a secondary TEVAR or of a conventional surgery of the aortic pathologies if and when required.

VP13

SURGERY IN ATHEROSCLEROTIC LESIONS OF RENAL ARTERIES

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Objectives: To evaluate the results of the surgical reconstruction of renal arteries with atherosclerotic lesions.

Methods: There were analyzed 150 surgeries for atherosclerotic lesions of renal arteries. In 95 cases (63.3%) transaortic endarterectomy was performed, in 32 cases (21.3%) the resection with renal arterioplasty and bypass were performed. Seven (4.7%) patients underwent renal artery decompression and 9 (6%) had nephrectomy. Epinephrectomy was performed in 7 (4.7%) patients. There were performed 73 (48.7%) superior/inferior diaphragmal splanchnic ganglionectomies as individual surgery or in addition to other reconstructive operations. In 15 (10.2%) patients concomitant aortofemoral bypass was performed.

Results: Positive clinical effect was observed in 139 (92.7%) patients. In 10 (6.7%) patients arterial hypertension remained, but signs of renal failure significantly decreased. One patient (0.7%) died of acute left ventricular failure.

Conclusions: Timely performed surgical reconstruction allows to significantly decrease blood pressure and signs of renal failure in patients with atherosclerotic renovascular disease.

VP14

ENDOVASCULAR REPAIR OF ASCENDING AORTIC PSEUDOANEURYSM: TECHNICAL CONSIDERATIONS USING THE RELAY BOLTON NON BARE STENT ENDOGRAFT

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Objectives: To present a technique for endovascular treatment using custom-made Relay Bolton Non Bare Stent (NBS) delivered via a left common subclavian artery (LSA) approach in a patient with a large asymptomatic ascending aortic pseudoaneurysm after Bentall surgery.

Methods: A 61-year-old man underwent Bentall surgery 18 years before admission for a type A dissection. He developed a pseudo-aneurysm originating from the ascending aorta with growing diameter over the years. Imaging with conventional angiography and computed tomographic angiography demonstrated a leakage at the outer curvature at the level of the distal previous anastomosis. Pseudoaneurysm sizes were 95 mm×90 mm. The treatment strategy was to deliver an endograft to seal the ascending aortic pseudoaneurysm via a left subclavian approach. With the patient under general anaesthesia, the LSA was exposed and a transient conduit (Darcon 10 mm) was applied to introduce the custom-made short nose Transport sheath. The custom-made design, a 40×36×65 mm Relay NBS graft was delivered to the ascending aorta, positioned and deployed under pharmacologically induced hypotension amplified by vena cava balloon occlusion. The patient tolerated the procedure well and the endograft was collocated in the right position without blocking the coronary arteries or the brachiocephalic trunk.

Results: Ascending aortic pseudoaneurysm is a clinical challenge due in part to the significant operative stress in a conventional surgical repair. With a high morbidity risk and a mortality rate ranging between 7 to 40% for conventional surgery, the question is if endovascular surgery could offer an less invasive option in carefully selected cases.

Conclusions: Ascending thoracic endografting is feasible and can repair secondary cardiac surgery complications.

VP15

MANAGEMENT APPROACHES OF CHYLOUS ASCITES AFTER ABDOMINAL AORTIC SURGERY TEN YEARS EXPERIENCES

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Objectives: Chylous ascites is defined as accumulation of lymphatic fluid from the lymphatic vessels in abdominal cavity. It is a rare, but potentially devastating and morbid complication of abdominal aortic surgery. Untreated, can be fatal, with patients dying from severe fluid and electrolyte abnormalities, malnutrition, and overwhelming infections, including peritonitis. Iatrogenic complications also can occur.

Methods: On January 1, 1996, a comprehensive computerized data base was created that prospectively recorded pertinent information on all patients with chylous ascites after abdominal aortic surgery evaluated at the Clinic for Vascular and Transplant Surgery, Clinical Center Vojvodina in Novi Sad. These data were analyzed retrospectively. During this 10-year period, consecutive patients with chylous ascites after abdominal aortic surgery were evaluated using a standardized protocol.

Results: From 1996 to 2006, we treated eight cases of chylous ascites after operations on the abdominal aorta. There were 7 men and 1 woman, with a mean age of 64 years (range: 46-82 years). Five cases (62.5%) occurred after abdominal aortic aneurysm resection, 2 (25%) after aorto-bifemoral bypass for occlusive disease, and 1 (12.5%) after resection of infected aortic grafts. Abdominal distention was the most common presenting symptom, occurring in seven of eight patients. The mean time from aortic operation to the development of symptoms was 15.5 days (range: 11-35 days). Diagnosis was confirmed by abdominal ultrasound and paracentesis, which yielded lipemic, sterile fluid in all patients. Therapeutic paracentesis was not successful when used alone, but, when combined with a medium-chain triglyceride (MCT) diet or total parenteral nutrition (TPN), it resulted in resolution of chyloperitoneum in two patients (25%). TPN alone or with paracenteses and/or diuretics was successful in 2 (25%) patients. Peritoneovenous shunt resolved chylous ascites in one patient not responding to diet and/or TPN. Operative ligation of the injured lymphatic channel was successful in all 3 (37.5%) patients treated by laparotomy when nonoperative efforts failed. Chyloperitoneum resolved in all but one (12.5%) patient. There were no death directly related to chylous ascites.

Conclusions: We reached the following conclusions: (1) Chylous ascites is a rare complication of aortic surgery; (2) The diagnosis is easily confirmed by paracentesis; (3) Nutritional intervention remains the mainstay of nonoperative treatment; (4) Repeated paracentesis should be avoided because several reasons; (5) Surgery is undertaken when conservative therapies fail (6) Contraindications to surgical correction of chylous ascites are based on the patient's comorbidities and his or her ability to tolerate surgery.

VP16

ENDOVASCULAR TREATMENT OF PATIENTS WITH RENOVASCULAR HYPERTENSION

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Objectives: Assessment of outcomes of endovascular intervention in patients with renovascular hypertension.

Methods: Results of 114 consecutive endovascular interventions performed in 101 patients with renovascular hypertension were evaluated: 60 angioplasties with stent implantation and 54 angioplasties without stenting. Seventy-six patients (75.2%) were male and 25 patients (24.8%) female. Mean age was 55±9.7 years. Ninety-three patients (92%) had atherosclerotic origin of the renal artery stenosis, six patients (5.9%) had aortoarteritis, and 2 (2%) patients had fibromuscular dysplasia. All patients underwent diagnostic aortography prior and up to one month after the intervention.

Results: According to aortography, there were revealed significant decrease of intraaortic systolic BP from 182.12±36.2 mmHg to 134±15.87 mmHg ($P<0.0005$) and diastolic BP from 125±33.21 mmHg to 80.54±14.68 mmHg ($P<0.0005$). Renal artery residual stenosis was 14.45±5.89% after stenting and 20±10.02% after the angioplasty. Immediate angiographic success was 100%. Positive clinical effect was demonstrated in 98 (97%) patients.

Conclusions: Endovascular interventions are an effective treatment of patients with renovascular hypertension.

VP17

SURGERY IN ATHEROSCLEROTIC LESIONS OF RENAL ARTERIES

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Objectives: To evaluate the results of the surgical reconstruction of renal arteries with atherosclerotic lesions.

Methods: There were analyzed 150 surgeries for atherosclerotic lesions of renal arteries. In 95 cases (63.3%) transaortic endarterectomy was performed, in 32 cases (21.3%) the resection with renal arterioplasty and bypass were performed. Seven (4.7%) patients underwent renal artery decompression and 9 (6%) had nephrectomy. Epinephrectomy was performed in 7 (4.7%) patients. There were performed 73 (48.7%) superior/inferior diaphragmal splanchnanglionectomies as individual surgery or in addition to other reconstructive operations. In 15 (10.2%) patients concomitant aortofemoral bypass was performed.

Results: Positive clinical effect was observed in 139 (92.7%) patients. In 10 (6.7%) patients arterial hypertension remained, but signs of renal failure significantly decreased. One patient (0.7%) died of acute left ventricular failure.

Conclusions: Timely performed surgical reconstruction allows to significantly decrease blood pressure and signs of renal failure in patients with atherosclerotic renovascular disease.

VP18

ENDOASCULAR INTERVENTION AND THE IMPACT ON VASCULAR SURGICAL TRAINING

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Objectives: Endovascular procedures have revolutionised vascular surgery and are being increasingly used to manage common vascular disorders. This study aims to audit the influence of endovascular interventions on the availability of traditional surgical experience for trainees.

Methods: A prospectively maintained vascular database between 1998 and 2006 was interrogated. Treatment of elective infra-renal abdominal aortic aneurysms (AAAs) and occlusive carotid artery disease was analysed. Treatment was classified as either endovascular or surgical. Annual incidence of interventions and grade of primary surgeon was recorded.

Results: During the eight year study period the annual incidence of elective AAA repair remained comparable (2006: 78 vs. 1998: 101). There was a trend towards increasing use of endovascular intervention to treat AAAs [2006: 47% ($n=37$); 1998: 29% ($n=30$); $P<0.05$], reducing the annual number of AAAs repaired surgically from 71 in 1998 to 41 in 2006. Trainees were recorded as primary surgeon in 73% ($n=30$) of the surgical cases and 38% ($n=14$) of the endovascular cases in 2006; 54% ($n=38$) of the surgical and 7% ($n=2$) of the endovascular cases in 1998. There was no statistically significant association between number of ruptured AAA repairs and endovascular procedures during the study period. The total number of carotid procedures performed annually increased throughout the study period (1998: 62 vs. 2006: 110), resulting in a trend for increasing numbers of surgical carotid interventions performed by trainees [1998: 52% ($n=32$); 2006: 49% ($n=47$); $P=NS$]. The introduction of endovascular carotid occlusion intervention accounted for only 13% ($n=14$) of cases in 2006, none performed by trainees.

Conclusions: Endovascular intervention for vascular disease is increasing in popularity, and represents an increasing proportion of interventions performed. This results in fewer opportunities for training in traditional surgical techniques. Longer training programmes plus increased supervision may be needed to maintain standards.

VP19

MENDELIAN RANDOMIZATION AND GENOTYPE-PHENOTYPE ASSOCIATION: THE CAUSAL RELATIONSHIP BETWEEN METHYLENE TETRAHYDROFOLATE REDUCTASE(MTHFR) C677T POLYMORPHISM AND ABDOMINAL AORTIC ANEURYSM (AAA)

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Objectives: The Methylene Tetrahydrofolate reductase (MTHFR) C677T polymorphism results in a substitution of thymidine nucleotide for cytidine at position 677 of the MTHFR gene resulting in a change from the wild type 'C'

allele to the risk (minor) 'T' allele. The latter results in homocysteinaemia which has been implicated in the pathogenesis of abdominal aortic aneurysm (AAA). Studies have also implicated the MTHFR genetic polymorphism in AAA formation although this is not consistent. Our aim is therefore, to determine if there is a causal association between MTHFR genetic polymorphism and AAA within the framework of mendelian randomization. Mendelian randomization is the random assignment of an individual's genotype from his or her parental genotypes that occur before conception. A causal relationship between MTHFR and AAA is therefore, free from bias and confounding just like a randomized controlled study.

Methods: This is a retrospective case-control study involving white caucasian participants. Our cases are those with imaging confirmed AAA whilst the controls are free from AAA. We recruited 816 study participants comprising 362 controls and 454 cases with a mean age of 70.21 years (CI: 69.587-70.55) We obtained some blood specimen from the participants from which we extracted genomic DNA. We subsequently genotyped the DNA sample for the MTHFR polymorphisms using a polymerase chain reaction (pcr) methodology. The pcr products were thereafter subjected to overnight restriction fragment length digestion with the restriction enzyme Hinf1. The resulting products were then run on a 2% agarose gel electrophoresis to yield the homozygote 'CC' and 'TT' genotypes and heterozygote 'CT' genotype.

Results: The distributions of the obtained genotypes (cases vs. controls) were as follows: CC (222 vs. 204), CT (189 vs. 132) and TT (43 vs. 26) accounting for allele frequencies of 0.70 (± 0.015) and 0.75 (± 0.016) respectively. The genotypes are in Harding-Weinberg equilibrium ($P=0.48$ for controls and $P=0.78$ for cases). The Allele difference odds ratio between cases and controls is 1.275 (CI: 1.024-1.587, $P=0.0296$) and the genotype odds ratio (CT+TT vs. CC) is 1.349 (CI: 1.022-1.781, $P=0.034$) and 1.254 ($P=0.032$) after correction for multiple testing.

Conclusions: We have shown that the MTHFR C677T genetic polymorphism is causally associated with AAA pathogenesis. Hyperhomocysteinaemia resulting from this polymorphism is amenable to folate therapy. Therefore, offering MTHFR C677T polymorphism genotyping test to people with other risk factors for AAA formation could prove a useful risk reduction strategy.

VP20

COMBINED SURGICAL AND RETROGRADE ENDOVASCULAR TECHNIQUE FOR TREATMENT OF CAROTID ARTERY DISSECTION - CASE REPORT

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Objectives: Spontaneous carotid artery dissection is rare but remains one of the main causes of stroke and increasingly recognized cause of headache or ophthalmologic events in young adults. Surgical management of this condition is related to elevated risk of cerebral ischemia.

Methods: We report a case of spontaneous common carotid artery dissection in a 44-year-old woman who was admitted to Neurology Department with a cortical stroke as primary symptom. Spiral computed tomography revealed a dissection and partial thrombosis of the right common carotid artery located in its initial section. The patient was referred to the vascular surgeon for further management. She underwent combined surgical and endovascular procedure in regional anesthesia. After arteriotomy and thrombectomy of the right common carotid artery, retrograde angiography was performed. It confirmed the diagnosis of the dissection. For the treatment Zilver stent 8/40 mm was implanted under DSA guidance. Arteriotomy was sutured without patch.

Results: Postoperative angio-CT demonstrated successful revascularization of carotid arteries and patient was referred to the Neurologic Department for supplementary treatment. Three-month follow-up period was uneventful.

Conclusions: Combined surgical and retrograde endovascular technique is feasible for the treatment of dissection of carotid artery and is valuable alternative for open treatment.

VP21

SURGERY OF NON-ATHEROSCLEROTIC DISEASES OF THE INTERNAL CAROTID ARTERY

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Objectives: Despite many advances in vascular surgery during the last decade and the emergent role of endovascular techniques in supra-aortic trunks, surgery of the internal carotid artery remains the unique alternative to treat certain patients such as those with non-atherosclerotic diseases. In an era of ever-expanding therapeutic modalities available to the vascular surgeon, it is important to remark that open surgery of the arteries to the head is still a very good option and, in many patients, is the treatment of choice or even the unique therapeutic option.

Methods: Here we report several cases of open surgery of non-atherosclerotic disease of the internal carotid artery in patients unfit for endovascular treatment.

Results: Open surgery of non-atherosclerotic diseases of the internal carotid artery is still the treatment of choice for most of the cases since endovascular techniques are not an option for this group of patients.

Conclusions: In the era of endovascular surgery, we think that it is important not to forget the role of open surgery and to review the experience of residents and young surgeons on the vascular surgery services regarding this type of techniques.

VP22

VASCULAR IMAGING IN BILATERAL SPONTANEOUS CAROTID ARTERY DISSECTION COMBINED WITH TYPE I AORTIC DISSECTION

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Objectives: Carotid artery dissection is one of the cause of ischemic stroke in patients without cerebrovascular risk factors.

Methods: The clinical and imagiological (MR angiography) findings in a 57-year-old man with bilateral spontaneous extracranial carotid artery dissection combined with Type I aortic dissection is described.

Results: The patient expressed that he had been operated on for Type II aortic dissection one year ago in a provincial hospital. Twelve days prior to admission he had had a dizziness and headache attack and had been transferred to our clinic. His physical examination was normal. The MR angiographies was diagnostic: A synthetic graft was seen at the proximal part of the ascending aorta. A false lumen of Type I dissection was lying down from the distal part of the ascending aorta to the iliac and femoral arteries. The dissection of the arcus aorta was reaching ahead to the bifurcation of the common carotid arteries in both sides. Medical treatment (anticoagulant and antiagregan) was given and the patient was discharged without any symptom and follow-up control was advised in three months interval.

Conclusions: In the dissection of the aorta and epiaortic vessels clinical assesment is fundamental for the diagnosis and treatment. In suspicious clinical cases CT and MR imaging techniques are reliable, rapid and noninvasive diagnostic methods. If there is not an obligatory cause, especially in asymptomatic patients, conservative (medical) therapy should be preferred.

VP23

SUCCESSFUL SURGICAL TREATMENT OF A RARE COMPLICATION OF THE CAROTID ARTERY ANEURYSM

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Objectives: Patient P. 50-year-old, was admitted to vascular department of surgical clinic with complains on presence of a tumor at the left anterior-lateral surface of the neck. This tumor appeared about a year ago. About three month ago two fistulas developed in this region. From time to time serous-haemorrhagic fluid discharged from these fistulas. Physical examinations revealed pulsating tumor 6x3x3 cm in size with systolic murmur.

Methods: Duplex ultrasonography visualized an aneurism of the common carotid artery with intraluminal thrombosis and two fistula channels between the aneurism and the skin surface on the neck. The both of these fistulas were thrombosed. This diagnosis was confirmed by spiral computer tomography.

Results: Resection of the aneurism with part of the sternocleidomastoid muscle and the skin, surrounding the fistulas, was performed. Restoration of the blood flow from the common carotid artery into the internal carotid artery was done using double autovenous by-pass, prepared from two segments of the vena saphena magna. Revision of the resected complex of tissues confirmed the preoperative diagnosis in details. The patient was discharged from the clinic in 15 days after surgery without any complications.

Conclusions: Duplex ultrasonography could provide very reliable diagnostic information for successful surgical treatment of such rare complication of the carotid artery aneurism.

VP24

ENDOASCULAR TREATMENT OF PSEUDOANEURYSM CAUSED BY PENETRATING INJURY OF THE ABDOMEN

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Objectives: Open surgical treatment of posttraumatic pseudoaneurysm of abdominal aorta located above celiac trunk is difficult and may lead to visceral arteries injury. Endovascular technique seems to be good alternative method of treatment, with lower risk of complication. We present a case of posttraumatic pseudoaneurysm of abdominal aorta treated by stentgraft implantation.

Methods: In 2006, 22-year-old male was referred to our Department due to pseudoaneurysm of abdominal aorta caused by penetrating injury of the abdomen. Before admission, patient was treated in another hospital due to haemorrhage caused by a stab wound of the abdomen. Surgical management consisted of laparotomy which revealed stomach wall perforation with severe bleeding. The puncture was sutured. There was no sign of bleeding after operation. Postoperative computed tomography showed a presence of large pseudoaneurysm (diameter 56x77 mm) located 20 mm above celiac trunk. At admission patient was stable, with no signs of hemorrhagic shock. After careful evaluation, we decided to exclude pseudoaneurysm with endovascular technique (straight tube stentgraft, Zenith Cook).

Results: Controlled computed tomography revealed complete exclusion of pseudoaneurysm, celiac trunk patency and no signs of infection. Postoperative period was uneventful. During follow-up period there was no sign of endoleak.

Conclusions: This case demonstrates feasibility and effectiveness of endovascular technique as a treatment of posttraumatic pseudoaneurysm of abdominal aorta located above celiac trunk.

VP25

EMERGENCY ENDOASCULAR TREATMENT FOR TYPE B DISSECTION COMPLICATED BY FALSE CHANNEL RUPTURE IN THE ABDOMINAL AORTA

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Objectives: The aim of the study was to describe the successful endovascular treatment of two cases of ruptured aortic dissections in the abdominal aorta.

Methods: Recently two patients (patient 1: a 72-year-old female; patient 2: A 78-year-old male) were treated for a ruptured aortic dissection in the infrarenal portion of aorta in an acute setting. Patient 1 was admitted with a ruptured acute abdominal dissection superimposed on an abdominal aortic aneurysm. Thoracic endografting followed by unilateral abdominal stentgraft placement with suprarenal fixation and ligation of the contralateral external iliac artery were performed. Perfusion to the left lower limb was restored by a femoro-femoral bypass. Patient 2, who 2.5 years earlier had a thoracic stentgraft implanted for a type B aortic dissection, was readmitted to our hospital with a ruptured false channel of the abdominal aorta. He underwent an endovascular procedure which consisted of: implantation of a covered stent across the detached ostium of the right renal artery and closure of the distal re-entry with a stent-graft limb implanted in the right iliac artery.

Results: Hemorrhage was contained and progressive healing of the aorta was observed in both cases. In case 1, an uneventful type II endoleak to the true channel of the AAA through the inferior mesenteric artery was observed. In case 2, limited inflow to the false channel was observed at the level of right renal artery. Patients were discharged from the hospital and presented no symptoms related to the aortic pathology at six month follow-up.

Conclusions: Our limited experience shows that in selected cases endovascular treatment for ruptured abdominal aortic dissections is feasible and effective. Each patient requires an individual approach according to the unique anatomical conditions in the presented aortic pathology.

VP26

EXPLANTATION OF AN AORTO-UNILIAC ENDOGRAFT WITH SUPRARENAL BARB FIXATION: A CASE REPORT

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Objectives: The explantation of an endoprosthesis from the abdominal aorta is subject to high morbidity and mortality rates. Below is the description of a case of urgent surgical removal of a thrombosed endoprosthesis. **Methods:** The case history: a 67-year-old patient, fitted with an aorto-aortic prosthesis for AAA in 1997, in May 2007 aorto-right uniliac endoprosthesis and cross-over femoro-femoral by-pass for an aneurysm of the common right iliac and occlusion of the common counter-lateral iliac; on the 27th day p.o., thrombosis of the endograft was detected, which was treated with locoregional thrombolysis and anticoagulant therapy. After 30 days, thrombosis of the entire endoprosthesis was again detected, with an occlusion immediately below the origin of the renal arteries. It was thus decided to proceed urgently with the surgical explantation of the graft by means of median xifo-pubic laparotomic access. To explant the endoprosthesis, a 20 ml syringe was used which was appropriately cut in the tapering portion.

Results: Having executed a longitudinal incision in the tube and liberated the distal portion of the endoprosthesis, the team proceeded with the removal of the iliac extension. Having anchored the tape of the distal extremity of the endoprosthetic body, the latter was inserted into the syringe, after the insertion of an aortic balloon for celiac clamping. It was decided to proceed with celiac aortic clamping using the balloon due to the presence of a hostile abdomen. Having inflated the aortic balloon and lengthened the section of the tube as far as the proximal anastomosis, the syringe was pushed cranially (keeping the endoprosthesis still) so as to cause the collapse of the supra-renal anchoring hooks. After everything was removed, standard infrarenal clamping was performed; the duration of the manoeuvre was approximately 2 min. The operation was completed with an aortobifemoral graft. The procedure took place, after administration of vitamin K, under blended anaesthesia (thoracic peridural and general) and controlled hypothermia; it required the infusion of 2800 ml of blood and 600 ml of plasma, and 20 h stay in Intensive Care. The patient was discharged on the 9th day in good overall condition.

Conclusions: Surgical conversion after EVAR is a technically demanding operation which is potentially lethal for the patient, especially in cases involving grafts with suprarenal anchoring.

Using easily-obtained materials, the technique used in this case permitted the removal of the endoprosthesis while conserving the renal vessels and the aortic walls.

VP27

ENDOVASCULAR REVASCLARIZATION IN PATIENTS AFTER CABG SURGERY

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Objectives: Nowadays there is constantly increasing number of CABG operations performed around the world. But the effectiveness of CABG surgery depends on the patency of venous and arterial conduits as well as the completeness of revascularization. The patency of saphenous vein grafts (SVG) and arterial grafts is limited due to recurrent atherosclerosis and thrombotic occlusions. It's well known that repeat CABG surgery is associated with a higher risk of mortality than first-time CABG. In this settings percutaneous coronary interventions (PCI) become the preferred alternative to repeat CABG surgery, but PCI in post-CABG patients suffering recurrent angina is complicated by high rates of distal embolization, myocardial infarction and restenosis.

Methods: To analyze the morphological changes in grafts and native coronaries as well as clinical outcomes of 36 consecutive post-CABG patients who underwent percutaneous revascularization.

Results: There were totally 114 grafts in 36 patients, the average number of grafts for one patient is 3.1 ± 0.7 ($M \pm m$); left internal mammary artery (LIMA)-32 (28% of all grafts); SVG-66 (58%); a.radialis was used in 16 cases (14%). The total number of lesions in grafts was 48, including 10 lesions located in LIMA grafts, 10 lesions in a.radialis grafts and 28 lesions

in SVG. PCI were performed on native coronary vessels in 22 (61.1%) patients, grafts were treated in 14 (38.9%). Drug eluting stents (DES) were employed in 14 patients, combined usage of bare metal stents (BMS) and DES took place at 4, 16 patients were treated using only BMS. LIMA was treated in 4 patients (11.1%), SVG in 6 patients (16.7%) and arterial conduits in 4 (11.1%). Proximal anastomotic lesions were treated in 6 patients (16.7%), body of the conduit in 2 (5.6%), distal anastomotic lesions in 6 (16.7%). Procedural success was 94.4% with good in-hospital outcome: no mortality and urgent bypass surgery cases, procedural Q-wave myocardial infarction (MI) rate 5.6%. Cumulative one-year rates were: mortality 5.6%, MI 8.3% and target lesion revascularization (TLR) 5.6%.

Conclusions: Elective revascularization of the grafts and native coronaries in post-CABG patients can be performed safely, with high procedural success and a low rate of in-hospital complications. Clinical effect was reached in all patients. Long-term follow-up showed very low TLR rate.

VP28

A NEW SHUNT METHOD IN A PATCH PLASTY OPERATION FOR ADULT TYPE OF COARCTATION OF AORTA

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Objectives: A forty-one-year-old man presented with hypertension, chest pain and dyspnea on exertion. Cardiac catheterization revealed coarctation of aorta and normal coronary arteries. Coarcted segment was located at distal to the left subclavian artery with a 40 mmHg of pressure gradient. A prosthetic patch plasty operation was decided.

Methods: The coarcted segment was exposed with a left posterolateral thoracotomy. When descending aorta was clamped, blood pressure in the right femoral artery fell down below 20 mmHg. Due to risk of medulla spinalis ischemia, a shunt placement between proximal and distal to the coarcted segment was decided. After heparinisation, aortic arch and descending aorta was cannulated with a 7 mm and a 6 mm Calmed[®] aortic cannula, respectively. Later, two cannulas were joined with a connector. When descending aorta was clamped again, blood pressure in the right femoral artery was between 60-70 mmHg. After an aortotomy in the coarcted segment, the coarctation ridge was excised. The coarcted segment was enlarged with a 4x10 cm, diamond-shaped Dacron patch. After the procedure, pressure gradient between the right radial artery and right femoral artery was 10 mmHg.

Results: The patient had no paraplegy or any other complication in the perioperative period.

Conclusions: In the surgical treatment of adult type coarctation of aorta, paraplegy due to cross-clamping develops in 2-3% of the patients. A shunt replacement between the proximal and distal to the coarcted segment helps to prevent this complication. We think this new shunt method that we described is safe, cheap and effective.

VP29

THE INFLUENCE OF VIDEOASSISTED THORACIC SYMPATHECTOMY ON FLOW MEDIATED DILATATION OF BRACHIAL ARTERY AND PERIPHERAL SKIN MICROCIRCULATION

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Objectives: The aim of the study was to investigate the influence of videoassisted thoracic sympathectomy (VATS) on hemodynamical properties of brachial artery and peripheral skin microcirculation of upper extremity.

Methods: Twelve patients (females 7, males 5) with hyperhidrosis of palms were included in the study. Mean age of the patients was 26.8 years. Resting diameter of brachial artery and its so called flow mediated dilatation (FMD) were measured by colour Doppler ultrasound after a 5-min period of upper arm ischemia. Skin blood flow and skin temperature on the dorsal surface of the hand and the tip of the IIIrd finger were measured with double channel laser Doppler flowmetry. Two sets of measurements were performed: 24 h before VATS and 24 h after VATS.

Results: VATS lead to increase of the resting diameter of brachial artery when compared with its diameter before the procedure (increase of $8.1 \pm 3.2\%$).

Moreover, sympathectomy significantly diminished FMD of brachial artery (from $7.2 \pm 2.1\%$ to $3.1 \pm 1.8\%$). Thoracic sympatectomy evoked significant increase of resting skin blood flow both on the dorsum of the hand as in the fingertip (increase of $42 \pm 16.3\%$ and $121.7 \pm 43.0\%$, respectively). Similarly with the skin temperature (increase of $8 \pm 0.8\%$ and $11 \pm 2.1\%$, respectively). The differences were statistically significant according to paired t-Student test ($P < 0.05$).

Conclusions: Increase of skin blood flow and skin temperature objectively confirms vasodilatation after videoassisted thoracic sympathectomy. Significant reduction of flow mediated dilatation of brachial artery, indicating its maximal dilatation after sympathectomy, also proves the anticipated effect of the procedure. Laser Doppler Flowmetry contrary to colour Doppler ultrasound may not be available in every vascular department. We think that measurements of flow mediated dilatation of brachial artery may also be a valuable tool for objective evaluation of the results of thoracic sympathectomy.

VP30

GENETIC ANALYSIS OF CONNECTIVE TISSUE IN PATIENTS WITH CONGENITAL THORACIC ABNORMALITIES

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Objectives: The most common congenital chest wall deformity is pectus excavatum, which is characterized by depression of the sternum, resulting in reduced internal thoracic volume and displacement of the heart and could be combined with congenital cardiac abnormalities such as VSD. Pectus excavatum is also a major component of many connective tissue disorders such as Marfan Syndrome. The main cause of sternal depression is thought to be elongation of the costal cartilages. The goal of our study was to analyze the genetic profile of rib cartilages from patients with pectus excavatum in comparison with normal cartilage.

Methods: Resections of the deformed cartilages were performed in the course of the corrective surgery by modified Ravitch procedure in 11 patients with pectus excavatum (ages 3-27). The control samples were obtained from five healthy donors (ages 6-17). Samples were hybridized onto Affymetrix U133plus2 Gene Chips. Microarrays were normalized and intensities were derived using GC Robust Microarray Analysis. A bayesian t-test was used to calculate statistical significance and was modified to a False Discovery Rate (FDR) by the Benjamini and Hochberg method. Genes were considered significant with a FDR < 0.05 and an absolute fold change more than 1.7. Gene ontology, chromosomal location and pathway analysis were performed using NIH David 2007 and were considered significant with FDR < 0.05 .

Results: Gene expression analysis revealed 238 statistically significant up-regulated (1.7-51.9 fold) and 52 down-regulated (2.5-8.3 fold) genes. Chromosomes 12, 2 and six were found to be most affected globally. Cytoband 19p13.3-q13.2 was found to be the most significant chromosomal region with a FDR of 0.034. Collagen (including COL2A1, COL9A1, COL27A1, COL9A2, COL4A2 and COL3A1 genes) was found to be significantly represented in cellular component ontologies (FDR=0.039). Four genes ranked the highest by fold change and FDR, four genes associated with cytochrome 19p13.3-q13.2, and six genes related to collagen were further validated by real-time reverse transcriptase-polymerase chain reaction (total 14 genes). Using current databases, no pathway was found to be significant at this time, however, molecular mechanisms of pectus excavatum continue to be defined and documented.

Conclusions: Multiple collagen genes were found to be significantly dysregulated. Gene expression analysis confirmed hyaline cartilage involvement in the development of congenital thorax abnormalities and enables further refinement of the up-stream genetic factors critical in triggering deformity evolution as a significant component of connective tissue disorders.

VP31

NEW VASCULAR PROSTHESIS WITH METALLIC SILVER IN THE TREATMENT OF VASCULAR GRAFT INFECTION - PRELIMINARY REPORT

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Objectives: Synthetic vascular prosthesis are commonly widespread with good reputation in vascular surgery. The only unsolved problem is graft infection. It is always difficult to eradicate and, if not recognized or adequately treated, eventually causes prosthesis failure, hemorrhage, or sepsis. Even in experienced centers and in recent series, mortality and amputation rates associated with infected grafts remain significant. There are some methods of treatment including graft replacement with autologous vein or arterial allograft. Those materials are more resistant to infection but also less mechanically resistant. The alternative can be dacron prosthesis impregnated with silver. There are two kinds of those prosthesis: one with silver acetate and a new one, with metallic silver which are made to relies silver for a long time (SilverGraft BBrown AG Melsungen, Germany). The aim of the study is to present preliminary results of treatment of vascular graft infection by replacement with new vascular prosthesis with metallic silver.

Methods: Between November 2007 and January 2008 three patients we performed prosthesis replacement for one with metallic silver. In all patients the indication was vascular graft infection: one ileo-femoral graft implanted one month ago during endovascular aneurysm repair and two infections in the groin affecting one limb of bifurcated aorto-femoral graft. The ileo-femoral graft was totally replaced and in remaining two cases one limb of bifurcated graft was resected and replaced by silver prosthesis. Debridement of surrounding tissues were performed intraoperatively. Patients received piperacilin/tazobactam, imipenem and itaconazol iv for 14 days.

Results: In all cases operative wounds healed uncomplicated in short observation period (1-2 months). There was no signs of persistent infection and patients were discharged in 12-th, 16-th, and 19-th postoperative day.

Conclusions: Short-time data of using SilverGard prosthesis in case of vascular graft infection seems very promising.

VP32

OUR SCIENTIST WHO INTRODUCED THE LETTER 'Ç' TO WORLD LITERATURE: ORD. PROF. DR. HULUSI BEHÇET (IN THE MEMORY OF HIS DEATH'S 60TH YEAR)

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Objectives: Hulusi Behçet was a Turkish dermatologist and scientist. He described a disease of inflamed blood vessels in 1937, which is named after him as the Behçet's disease.

Methods: In 1947, at the suggestion of Prof. Mischner of the Zurich Medical Faculty during the International Medical Congress of Geneva, the finding of Dr. Behçet was named 'Morbus Behçet'.

Results: Though it was evaluated in the early days as 'Behçet's Syndrome', 'Trisymptom Behçet', and 'Morbus Behçet', today the disease is universally called 'Behçet's Disease' in medical literature.

Conclusions: This was the first successful detailed explanation report. In following decades, there were so great successes that it became routine clinical procedure. Workers studied about this procedure will always be remembered with respect.

VP33

DIAGNOSTIC EVALUATION OF A GIANT SEROMA CASE DEVELOPED 3 MONTHS AFTER FEMORAL EMBOLECTOMY

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Objectives: In daily practice of vascular surgery, postoperative use of intravenous heparin is indicated as a risk factor for postoperative symptomatic seroma development. According to the literature, a significant cause that we face this problem with increasing incidence may be the postoperative use of high dose heparin.

Methods: Our case is a 72-year-old male who has been under hemodialysis program for three years due to chronic renal failure. He underwent a successful femoral embolectomy in our clinic due to acute arterial occlusion developed on his right lower limb three months ago. He was hospitalized due to increasing swelling at his right groin region.

Results: Physical examination revealed a non-pulsatile mass of cystic nature with dimensions of 10x10x5 cm at right inguinal region. Color Doppler ultrasound pointed out a cystic development of 87x58 mm in diameter without

any sign of vascularization. Intraarterial DSA also visualized this development. We assumed that intermittent heparinization for hemodialysis during postoperative period played a significant role in etiology and treated the patient via surgical approach.

Conclusions: Although postoperative seroma formation is a rare complication, it is a bothersome and hard-to-treat situation when occurred. We recommend to review the postoperative use of heparin as it is defined as a significant factor in etiology and immediate surgical approach should be the treatment of choice.

VP34

TEZOSANTAN REDUCES THE RENAL INJURY INDUCED BY ABDOMINAL AORTIC ISCHEMIA-REPERFUSION IN RATS

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Objectives: The aim of this study was to examine the effect of tezosentan on renal injury induced by abdominal aortic ischemia-reperfusion (IR) in rats.

Methods: Twenty-four Wistar-Albino rats were randomized into three groups (eight per group). Control group underwent laparotomy and dissection of the infrarenal abdominal aorta without occlusion. Aortic IR group underwent laparotomy and clamping of the infrarenal abdominal aorta for 120 min followed by 120 min of reperfusion. Aortic IR + tezosentan group underwent same aortic IR periods, and received a bolus intravenous injection of 10 mg/kg tezosentan before ischemia plus continuous intravenous infusion of 1 mg/kg/hr tezosentan during 120 min ischemia and 120 min reperfusion. Blood and kidney tissue samples were obtained for biochemical and histological analysis from all rats, respectively.

Results: Biochemical analysis showed that, aortic IR significantly increased ($P<0.05$ vs. control group) while tezosentan significantly decreased ($P<0.05$ vs. aortic IR) the plasma levels of malondialdehyde, superoxide dismutase, catalase and myeloperoxidase. Histological analyses showed that aortic IR significantly increased ($P<0.05$ vs. control group) while tezosentan significantly decreased ($P<0.05$ vs. aortic IR) focal glomerular necrosis, dilatation of Bowman's capsule, degeneration of tubular epithelium, necrosis in tubular epithelium, tubular dilatation and interstitial inflammatory infiltration in renal tissue samples.

Conclusions: The results of this study indicate that tezosentan reduces renal injury induced by aortic IR in rats. We think that tezosentan exerted this beneficial effect via reducing oxidative stress and lipid peroxidation, inhibition of leukocyte infiltration into renal tissue and acting cytoprotective on renal tubular cells after aortic IR.

VP35

RENAL AUTOTRANSPLANTATION AS A TREATMENT OF SEVERE RENOVASCULAR HYPERTENSION - CASE REPORT WITH 20 YEARS FOLLOW-UP

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Objectives: Renal autotransplantation is used as an alternative treatment of complex renovascular disease. In these cases endovascular technique may be ineffective and lead to ischemic injury. We present a case of patient with renovascular hypertension caused by severe atherosclerotic stenosis of renal arteries.

Methods: In 2006, 68-year-old woman was admitted to our Department due to suspected stenosis of renal artery of autotransplanted kidney.

20 years before present hospitalization, the patient was treated due to malignant renovascular hypertension with systolic blood pressure (SBP) over 220 mmHg, caused by stenosis of both renal arteries. The surgical treatment included aorto - renal by-pass (using saphenous vein) on the left side and autotransplantation of right kidney to the left iliac fossa with anastomosis to the hypogastric artery. Patient required only modification

of antihypertensive drugs during next years of follow-up. There was no signs of blood flow disturbances in autotransplanted kidney in control ultrasound until two years before present admission. Doppler US showed significant stenosis of renal artery. The treatment consisted of percutaneous transluminal angioplasty (PTA) with stent insertion with good clinical outcome.

Results: During present admission, the patient had moderate hypertension (SBP 150-160 mmHg). Kidney function was not compromised, with creatinine levels within normal range. Doppler US showed no signs of restenosis. After modification of antihypertensive drugs dosage, we observed reduction of blood pressure.

Conclusions: This case demonstrates feasibility and effectiveness of renal autotransplantation as a surgical treatment of complex renovascular disease in long-term follow-up.

VP36

BROKEN CATHETER IN THE LOWER EXTREMITY ARTERIES

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Objectives: Foreign bodies in the arteries are occasionally seen as a complication of invasive cardiologic and radiologic interventions.

Methods: The patient was 65-year-old man. During the coronary angiography the catheter had been broken during pull out in the femoral artery. Two pieces of catheter (2.5 and 4 cm long) was recognized in the right femoral and popliteal arteries with scopy.

Results: The broken pieces of catheter was removed through femoral and popliteal arteriotomies.

Conclusions: During the all kind of vascular interventions this complication should be kept in mind and the foreign bodies should be removed.

VP37

CASE REPORT: ACUTE MESENTERIAL ISCHAEMIA IN A YOUNG FEMALE

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Objectives: Acute mesenterial ischaemia in young adults is a very rare and unusual pathology. A possible cause could be the antiphospholipid syndrome (APS) - a thrombophilic disorder in which venous and arterial thrombosis can occur. We present a case of acute mesenterial artery thrombosis in a young female patient.

Methods: A 24-year-old female was admitted in the surgical department with complaints of severe abdominal pain and vomiting during one day. Approximately seven months earlier she was operated with a suspicion of appendicitis; before that she had had quite similar symptoms, only the pain was less intensive. During the operation partial necrosis of the small intestine was found and a resection of the necrotic intestine was performed. After surgical interventions there occurred a small thrombotic lesion in the wall of the abdominal aorta, straight at the beginning of the superior mesenteric artery (SMA) detected with CT angiography (CTA). As the lesion did not cause significant stenosis, anticoagulant treatment with warfarin was started. During six months treatment the lesion did not change but then, for an unknown reason, warfarin treatment was terminated. During the following four weeks the patient had weak abdominal pain which became worse; finally the patient was readmitted after severe abdominal pain and vomiting during one day. CTA showed a floating thrombus in the abdominal aorta and in the proximal part of the SMA. The thrombotic lesion was markedly larger compared with earlier findings, causing haemodynamically significant stenosis of the SMA. The patient was immediately operated, thrombectomy of the abdominal aorta and SMA with a patch closure was performed. After 48 h, during a second-look operation, a resection with length of about 70-80 cm of the small intestine was done. Anticoagulant treatment was continued after surgery.

Results: The patient recovered from surgery without major complications. As anticardiolipine antibodies were detected later in the patient's blood, primary APS was suspected and permanent anticoagulant treatment with warfarin was prescribed. Two months after surgery a follow-up CTA was done and no thrombotic lesions were detected in the abdominal aorta or the visceral arteries.

Conclusions: This case illustrates a rare life-threatening complication of thrombophilic disorder and the importance of anticoagulation treatment following thrombotic complication.

VP38

VISCERAL ANEURYSMS: REPORT AND REVIEW OF THE LITERATURE - CASE REPORT

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Objectives: The visceral aneurysms are rare and prone to rupture. The rare renal aneurysm may result indeed in renal parenchyma loss. The endovascular treatment is safer and has become the gold standard in the management of this problem. The objective of this work is to report a case of visceral aneurysms.

Results: A 56-year-old woman who was submitted to a computed tomography scan, because of her history of abdominal aortic aneurysm in the family. She presented a bilateral renal and one spleen aneurysm. She underwent to a successful arterial embolization with detachable steel coils of the right renal aneurysm, without any related complication. The others aneurysms were kept in an expectancy policy.

Conclusions: The inusitate of this case was the fact that three aneurysms were found in a healthy asymptomatic patient. The embolization with coils of visceral aneurysms can be done with safe, despite the fear with some problems as parenchyma loss.

VP39

CORONARY-SUBCLAVIAN-VERTEBRAL STEAL SYNDROME. A CASE REPORT

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Objectives: Coronary-subclavian steal is uncommon condition but important to take into consideration before coronary artery bypass surgery.

Methods: We report a 43-year-old female, who had severe anginal pains associated with subclavian-vertebral steal syndrome. On her history, there had been Takayashu arteritis. Left subclavian artery was 98% proximal stenosis on angiogram. Coronary angiograms show left circumflex coronary artery-subclavian artery collaterals.

Conclusions: He underwent successfully stenting the left subclavian artery. The patient showed good postprocedure outcome without complications.

VP40

PERCUTANEOUS ARTERIAL CLOSURE AFTER CORONARY ANGIOGRAPHY WITH ANGIO-SEAL: VASCULAR COMPLICATIONS

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Objectives: Femoral artery closure with Angio-Seal is an extended procedure but not innocuous. We describe our most recent experience.

Methods: Between 2005 and 2007, 2000 coronary artery angiographies has been done and Angio-Seal has been used in all of them. Fourteen patients developed ischemic complications early or late after femoral artery closure. A patients developed an infected pseudoaneurysm of the common femoral artery, five presented a pseudoaneurysm of the common femoral artery, 3 a femoral haematoma, 3 suffered an acute limb ischemia, and 2 patients had a subacute limb ischemia.

Results: All the patients required a vascular surgical intervention. Direct repair was done in seven patients and arterial reconstruction in seven by means of Goretex bypass (n: 4) or saphenous vein bypass (n: 3). In all the patients the operation resolved the Angio-Seal complications without consequences.

Conclusions: The incidence of complications associated to the percutaneous closure of the femoral artery with Angio-Seal is low but always required surgical intervention that can be done with satisfactory results.

VP41

FASCIOTOMY FOR CRUSH INJURY; THE RESULTS OF TWO YEARS FOLLOW-UP IN BAM EARTHQUAKE

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Objectives: At 5:30 AM of December 25, 2003 a strong earthquake was occurred in Bam that had about 80 thousands casualties. St Zahra hospital as a referral center was admitted 255 patients and fasciotomy were done in

twenty patients because of severe soft tissue crush injury of upper and lower extremities. We evaluated the complications and outcome of fasciotomy in these patients.

Methods: In 20 cases with crush syndrome, twenty-six fasciotomy of extremities were done. In 24 months of follow-up, sensation and motor function of limbs and joints' range of motion were evaluated.

Results: After two years, all of patient could walk appropriately by themselves and joints' range of motion were within normal ranges. In seven patients (11 extremities) hypoesthesia or hyperesthesia relieved utterly and remained cases had satisfactory or normal sensation in extremities. Only in one patient, sensation was limited in safenous dermatome because of radical debridement. The rest patients had suitable sensation in palmar region.

Conclusions: Fasciotomy is not only a safe procedure in patients with crush syndrome but also is necessary for limb preservation. Fasciotomy also can preserve normal function of limbs. Indubitably, Physical medicine and rehabilitation and using of prosthesis are necessary to obtain best performance. In a nutshell, fasciotomy should be done for limb salvage; even it could not preserve limb function utterly.

VP42

ADULT STEM CELL AUTOTRANSPLANTATION IN CHRONIC CRITICAL LIMB ISCHEMIA

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Objectives: Recently the therapeutic potential of adult stem cells in the treatment of peripheral arterial diseases has become increasingly evident, since implantation of bone marrow mononuclear cells (BM-MNC) or peripheral blood mononuclear cells (PB-MNC) into ischemic limbs can improve tissue vascularization.

Methods: Thirty patients with severe unilateral lower limb ischemia, with no option for standard revascularization therapies, were treated. Autologous BM-MNC were implanted into the ischemic limb in 13 cases and 17 received PB-MNC. The patients were monitored during 24 weeks with resting ankle-brachial pressure index (ABI), pain-free walking distance and rest pain scale evaluation.

Results: Twenty-one patients had been specifically advised to undergo major limb amputation that was avoided in 14 (67%). ABI significantly improved in the treated limb in both groups. Rest pain significantly improved in both groups at week 4 and at 24 weeks patients were completely pain-free. Pain free walking distance progressively improved in 13 groups. No related adverse effects were observed in any patient throughout the therapeutic procedure.

Conclusions: The methods of autologous BM-MNC and PB-MNC implantation in patients with critical lower limb ischemia showed to be effective procedures without related complications. These results encourage to continue clinical studies in this field.

VP43

FEMORAL PSEUDOANEURYSMS POST CARDIAC CATHETERIZATION SURGICALLY TREATED: EVOLUTION AND PROGNOSIS

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Objectives: To analyze the postoperative evolution of patients submitted to surgical repair of femoral pseudoaneurysm after cardiac catheterization.

Methods: Prospective study. Cardiovascular risk factors, related to surgery and cardiac catheterization were collected prospectively in 79 patients from 2003 to 2006 in an University Hospital. The indications of surgery included devitalization of adjacent soft tissue and skin, rapid growth, infection, bleeding, hemodynamic instability or failure of the percutaneous treatment. Patient and management related predictors for 30-days outcome were analysed.

Results: Fifty-six patients (56/79, 71%) underwent some type of postoperative complication, the most frequent being the need for a transfusion. Infection (15/79, 19%) and dehiscence of the surgical wound (10/79, 12.7%) were the other two most common complications. The mortality related to the intervention was 3.8% (3/79). The mean hospital stay was 32.5 days (\pm 28.4 days) Significant risk factors in logistic regression model were woman ($P=0.023$, $OR=9.66$), more than 70-years-old ($P=0.049$, $OR=0.15$) and the concurrent use of anticoagulation or antiplatelet therapy after the cardiac

catheterization ($P=0.005$, $OR=0.03$). The surgical interventions were more often during the summer months, particularly May and August.

Conclusions: Patients treated surgically of femoral pseudoaneurysm post cardiac catheterization present a high postoperative morbidity and hospital stay. Factors such as female gender, age over 70-years-old and treatment with anticoagulants or antiplatelets increase the postoperative morbidity. A seasonal influence was appreciated, with a higher frequency during the summer period.

VP44

PHYSIOPATHOLOGICAL CHARACTERISTICS OF THE ARTERY PROFUNDA FEMORIS WITH OCCLUSION OF THE SUPERFICIAL FEMORAL ARTERY

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Objectives: The profunda femoral or deep femoral artery, physiologically supplies the tissue of the thigh. The profunda femoris artery is recognized the most important collateral vessel for natural bypassing when is obstructed superficial femoral artery and is essential for maintaining limb viability. It is very interesting evaluate the hypothetical growing of the profunda femoris artery in situations of occlusion of superficial femoral artery.

Methods: In 45 patients, we examined 60 femoral angiograms. The angiograms were measured with VIDS III program image (computerized planimetry) to quantify the different parameters. Group I (n: 20 PFA angiograms) consisted of 10 patients with normal profunda and superficial arteries. Group II (n: 20 PFA angiograms) consisted of 20 patients with angiographically proven SFA occlusion and normal PFA. Group III (n: 20 angiograms) consisted with superficial arteries occluded and stenosis of the first segment of the deep femoral arteries. The parameters evaluated are area, length, maximum diameter, angle, ferrets diameter and form factor of the deep femoral arteries.

Results: There are changes of the different parameters studied with differences between the groups studied but without statistically significances differences. In the comparative analyses, the presence of superficial femoral artery occlusion did not show any relation with the planimetry of deep femoral artery.

Conclusions: In conclusion the profunda femoris artery is in theory, the greatest source of collateral vessels to the distal femoropopliteal segment. The incidence of growing of deep femoral artery in compensation of occlusion is low and the different are not statistically significant.

VP45

COMPARISON OF RESULTS OF DISTAL REVASCULARIZATION IN DIFFERENT GROUPS OF PATIENTS: GENERAL POPULATION, DIALYSED, PATIENTS AFTER FAILED PTA

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Objectives: The aim of this study was to compare the results of primary OS for CLI in general population with the results in dialysed patients and in patients with previous failure of PTA, in order to determine the correct approach to every patient with CLI and the actual role of OS.

Methods: Between January 2004 and July 2007, 402 patients (266 males, 136 females) aged between 46 and 95 (average age 72) underwent OS or EV in response to CLI (39% foot finger or ante foot gangrene, 12% hind foot gangrene, 28% ulcers, 11% rest pain, 10% severe claudication). General comorbidities were: diabetes 66%, clinically apparent coronary artery disease 47%, previous CABG 8%, COPD 70%, chronic renal insufficiency 20%, ESRD 13%. We performed in these patients 239 EV (47%) and 267 OS (53%). Open revascularisations were femoro-tibial or plantar and popliteo-plantar bypasses with autologous material in 93% and PTFE in 7%. OS involved 29 (11%) dialysed patients (group 1), 98 patients with failure of previous EV treatment (37%), frequently performed in different and non-surgical centres (group 2), and 140 patients (52%) with CLI non-dialysed and not previously submitted to EV treatment (group 3, control group). We retrospectively compared the early results in these three groups of patients treated by OS in term of level of revascularisation, primary patency, amputation and mortality.

Results: Revascularizations have been directed to the tibial or to the plantar arteries at the ankle or foot. Those directed to the plantars were respectively 83% in dialysed patients ($P 0.005$); 76% in patients with previous

failed PTA. Primary patency, amputation rate and mortality were respectively: 72.5% ($P 0.5$) -4% ($P 0.5$) in patients with previous failed PTA; 93.6% -3.5% -2.1% in general population.

Conclusions: In patients with ESRD, and in patients after failed EV therapy, the subsequent open surgery had to be more distal and technically demanding. Its results were significantly worse than in the general population, with an increase of redo. Our data suggested that EV should not be attempted as the first choice in every patient affected by CLI, and we believe that OS still is the primary treatment for the most advanced clinical situations, particularly in presence of ESRD and extensive loss of tissue, and of a very diseased arterial bed.

VP46

TO REVIEW LITERATURE AND PRESENT 2 CASES OF SUBCLAVIAN ARTERY ANEURYSM DUE TO CERVICAL RIB

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Objectives: To describe surgical approach for subclavian artery aneurysm as an alternative to conventional reconstructive surgery and review of documented managements of this disease.

Methods: The first case was a 34-year-old woman presented with aneurysm of left subclavian artery secondary to cervical rib and occlusion of the brachial artery due to embolization. The patient had pulsatile mass and bruise in left supraclavicular region.

Results: After excising cervical rib and scalenectomy through a combined supraclavicular and infraclavicular approach, aneurysmal dilatation rapidly relieved and artery returned to normal caliber. Then by another incision in anticubital region thromboembolectomy was done. In 3-months follow-up, the patient was well and free of symptoms and Doppler ultrasonography revealed lack of aneurysm and patency of arteries in left upper extremity. The second case was a 43-year-old woman with a large pulsatile mass in right supraclavicular region without any ischemic symptoms. After confirming aneurysm of right subclavian artery (midportion) by angiography, first operation was done and aneurysm was repaired by supraclavicular incision and partial sternotomy. In the second operation excision of first rib and scalenectomy was done through axillary approach. In 2-year follow-up the patient was like the first case.

Conclusions: All previous studies in the last decade support the replacement of the aneurysm of the subclavian artery by venous or synthetic graft in the cases of large aneurysm or embolic complications but our patients were treated without this operation.

VP47

EFFECTIVENESS OF USING A NEW COMBINED DRUG 'CYTOFLAVIN' FOR TREATMENT OF PATIENTS WITH PERIPHERAL ARTERY DISEASE

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Objectives: Effects of intravenous infusions of new developed drug 'Cytoflavin' (combination of succinic acid, inosine, nicotinamide and riboflavin) on painfree walking distance (PWD), maximal walking distance (MWD) and ankle brachial index (ABI) in patients with peripheral arterial disease (PAD) (Fontaine stage II-III), were assessed in this clinical study.

Methods: The patients with previous history of typical intermittent claudication during at least six months (18 persons) were selected to participate in this trial. The following inclusion criteria were used: standardized painfree walking distance 200 m or less; ankle brachial index 0.7 or less with further decrease after exercises. Treatment programme included 10 everyday intravenous infusions of 20 ml of Cytoflavin (added in 200 ml of 0.9% solution of NaCl). Treadmill tests and measurements of ABI were done before and just after this course of infusions.

Results: Analysis of the results demonstrated the following changes of the studied parameters: PWD: average increasing 38.5% (from -5% to +89%); MWD: average increasing 44.8% (from +7% to +122%); ABI: average increasing 7.3% (from -12% to +18%); All of the patients marked improving of their quality of life. As a result of this treatment. In two patients with diabetes mellitus regressed symptoms of peripheral neuropathy.

Conclusions: This study demonstrates that using of Cytoflavin is effective and leads to positive modifying of the natural course of intermittent claudication and improves blood circulation in the ischemic lower extremities.

VP48

BYPASS SURGERY FOR INFRAPLOPTEAL OCCLUSIVE DISEASE WITH POOR DISTAL FLOW ON ANGIOGRAPHY

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Objectives: We aimed to investigate whether limb salvage bypass operation improves outcomes in patients with critical infraplopteal ischemia who has poor or no distal arterial flow on angiography.

Methods: Between January 2000 and May 2007, 42 patients with severe tibial and peroneal occlusive disease and poor distal arterial flow on angiography were included. Patients had class IIB, III or IV disease according to Fontaine classification. Ongoing rest pain, ischemic ulceration, or gangrene limited to the forefoot or heel after a two week medical therapy were indications for surgical operation. Preoperative arterial Doppler ultrasonography and arteriography were performed in all patients. Doppler signals over major vessels in the foot were useful in determining a recipient site when arteriography was inadequate. 19 patients (15 males and 4 females) underwent distal bypass operation. Other 23 patients (17 males and 6 females) were followed with medical therapy. The age ranged from 57 to 82 years in the surgical group and 63 to 80 in the medical group. The graft material was only autogenous vein in 16 patients. Prosthetic graft was used additionally in three patients. The outflow distal anastomosis was performed on tibialis posterior, dorsalis pedis, anterior tibial, peroneal, lateral plantar arteries. Regional anesthesia was used in all cases.

Results: There were 3 (15.8%) early and 2 (10.5%) late graft failures. Limb salvage rates were 84.2%, 84.2%, 73.7% in the surgical group, and 82.8%, 69.9%, 64.3% in the medical group, respectively, in six months, one year, and three years. Limb loss occurred 26.5% of the surgical group, and 34.4% of the medical group ($P<0.05$). The levels of the amputations tend to be lower in the surgical group than the medical group but it was not significant statistically ($P<0.07$). One patient (5.3%) died because of myocardial infarction in seventh month in the surgical group and one patient (4.3%) died because of cerebrovascular hemoragy in eleventh month in the medical group. ($P=ns$). Median hospital stay was 10.5 days (range, 3-37 days).

Conclusions: We think that limb salvage bypass operation may be preferred for patients with critical limb ischemia and poor distal flow on angiography. Infraplopteal bypass will provide limb salvage and a functional extremity.

VP49

TWINS ANEURYSMS OF THE SUBCLAVIAN ARTERY DUE TO ATHEROSCLEROSIS: A CASE REPORT

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Objectives: True aneurysm of the subclavian artery is extremely rare. Whereas twins aneurysms of the subclavian arteries are not seen in the literature in our research. The most common aneurysms of a subclavian artery aneurysm, those associated with thoracic outlet syndrome, and post-traumatic aneurysm, atherosclerosis is the most common cause. Syphilis, tuberculosis, and cystic medial necrosis are less often the cause. These aneurysms can rupture, thrombose, embolize, or cause symptoms by local compression. Surgical treatment is generally indicated. A case of a surgically treated, asymptomatic, atherosclerotic twin's aneurysm of the proximal and second right subclavian artery is presented.

Methods: A 44-year-old man had a history smoking and in a good health underwent routine physical examination, which demonstrated subclavicular pulsatile mass. Arch aortography and coronary arteriography was performed. Aortography showed normal arterial anatomy with twins aneurysm beginning inisial subclavian artery and ending to the truncus brachiocephalicus artery. Coronary arteries was founding as a normal. Their sizes was accounted 3 cm and 6 cm. The patient underwent elective repair via mini j right sternotomy and supraclavicular incision. A dense inflammatory process was noted around the twins aneurysms. Truncus brachiocephalicus, right common carotid artery and subclavian artery was explored. The proximal subclavian artery was unsuitable for anastomosis side because of the inisial subclavian artery in the aneurysm area too. With a side-biting clamp placed on the truncus brachiocephalicus bellow the vessel, the subclavian artery origin area with 8 mm synthetic graft end to side technic was anastomozed. The aneurysm was resected, and the more distal subclavian artery was mobilized implanted end to end onto the axillary artery.

Results: Normal left upper extremity pulses were established, and the patient had an uneventful recovery. He was discharged on the sixth postoperative day and has remained well through follow-up one months later.

Conclusions: Modern surgical results with SAA and other procedures for disease of the supraaortic trunks are generally quite good, and an operative mortality rate of <5% should be anticipated for uncomplicated cases. Thus, most reasonably health patients with SAA should be offered surgical or endovascular treatment. Because patients with atherosclerotic SAA commonly have or have development of aneurysmal disease elsewhere, careful and complete evaluation and follow-up are of critical importance.

VP50

SUCCESSFUL RE-REVASCLARIZATION OF A HIGH RISK CASE WITH FEMORO-FEMORAL EXTRAANATOMIC BYPASS

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Objectives: Routine use of femorofemoral bypass grafting technique simplified the surgical therapy of unilateral iliac arterial obstruction. It was proved that this intervention has a less complication rate and is a very satisfactory reconstructive procedure.

Methods: Our case was a 60-year-old diabetic male. He underwent a CABG operation four years ago and an aortobifemoral bypass grafting operation a year ago at a different institution. Three months before his admission he started to experience pain in the right lower extremity and intermittent claudication with 100 m of a walking distance. Intraarterial DSA was performed revealing that right iliac arterial structures were totally occluded and right superficial femoral artery showed filling via collaterals at a low density.

Results: Right femoral profundoplasty procedure was carried out. Femorofemoral bypass grafting with a 8 mm ringed PTFE graft was also performed. He was discharged on 5th postoperative day. During the follow-up examination at the end of the first month, distal pulses were palpable and a full functional recovery was observed. Color Doppler ultrasound confirmed the graft patency.

Conclusions: We recommend the use of this technique whenever it is indicated regarding the existence of close correlation between this technique and anatomic bypass techniques in terms of long-term graft patency.

VP51

OUR LATE PTFE GRAFT INFECTION CASES IN LOWER EXTREMITY WITH LIMB SALVAGE

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Objectives: Arterial reconstruction is the most important surgical strategy for patients with arteriosclerotic obstruction in the lower limbs. One of the most feared complications of the use of a prosthetic material is the appearance of infection after implant.

Methods: In this study we present three ASO cases operated with using PTFE grafts. Our first case that his left femoroplopteal PTFE graft was infected two months ago after operation because incorrect dressing for wound in an other institution. Our second case underwent aortobifemoral Y-grafting and a right femoroplopteal bypass grafting two months ago at another institution. Our last case underwent aorto-right femoral artery bypass grafting three months ago at another institution having a purulent drainage from inguinal incision.

Results: We present our successful medical and surgical therapy modalities under light of literature. MRSA grew in all of our three cases. In our first case, the artificial graft was extracted and femoral profundoplasty was carried out for limb salvage. Our second case underwent removal of the infected graft via femoral and suprageneal exploration in the first operative session. First session includes the removal of one third of the right limb of the infected Y-graft. During the second session prior to complete removal of Y-graft, left axillofemoral bypass grafting was carried out. Our third case received proper parenteral antibiotherapy for six weeks to control the infection. All of these cases were discharged with cure and no limb loss.

Conclusions: Synthetic vascular prostheses have been developed to supply the limited supplement of native graft materials. The combined usage of systemic antibiotic prophylaxis and native saphenous grafts in high risk patient has been shown to be more effective in decreasing the incidence of prosthetic vascular graft infections.

VP52

HEMODYNAMIC PROGNOSIS OF THROMBOTIC COMPLICATIONS AFTER INFRAINGUINAL VEIN BYPASS GRAFTING AT THE PATIENTS WITH A CRITICAL LIMB ISCHEMIAP.I. Nikulnikov¹, V.N. Pshenychnyy², A.A. Ivanenko², E.V. Kashirova¹, Y.V. Pshenychna²¹National Institute for Surgery and Transplantology after AA Shalimov Academy of Medical Sciences of Ukraine Kiev, Ukraine; ²Institute for Reconstructive Surgery after VK Gusak Academy of Medical Sciences of Ukraine Donetsk, Ukraine

Objectives: The greatest number of femoropopliteal and femorotibial graft thrombosis at the patients with CLI occurs within the first 12 postoperative months. It was proved that the causes of it were technical and tactical errors made during reconstruction and also poor outflow. Today there are no precise tactical protocols taking into account the magnitude of peripheral resistance that complicates forecasting outcome of a revascularization of an extremity at CLI. To study opportunities of invasive and noninvasive methods of diagnostics in the evaluation of a peripheral resistance and forecasting thrombotic complications.

Methods: At 111 patients with CLI in preoperative period orthostatic stress testing by transcutaneous oxymetry was used, and also intraoperative floumetry for evaluation of microcircular reserve and peripheral vascular resistance (the outflow through the recipient artery). Measurements were made before reconstruction on the artery at the site of distal anastomosis. The impotence of the assessed runoff has been studied. Indications for surgery were rest pain ($n=57$), ischemic ulcer and gangrene ($n=54$). Fifty femoropopliteal (from them 14 consecutive two-storeyed infrainguinal) and 61 femorotibial (from them 9 foot) shuntings were executed. At 29 (26.1%) patients early graft failure developed within a year.

Results: Before and after reconstruction the patients with graft occlusion had a significantly lower artery runoff and orthostatic increase of PO_2 (60 vs. 90 ml/min and 9 vs. 24 mm) and flow (70 vs. 145 ml/min) than patients with patent graft. Prognostic value of high runoff for femoropopliteal bypass is 90%, for femorotibial bypass -76%, high flood flow for grafts -92%, high increase of PO_2 -85%. Prognostic value of low parameters (predictive value of a negative test) is accordingly: 71%; 75%; 80%; 88%.

Conclusions: The runoff of an arteria and orthostatic growth of PO_2 before operation, and also volumetric blood stream for bypass after operation have high correlation with early and intermediate results of infrainguinal vein bypass and can be used for forecasting the results of these surgical operations.

VP53

LIMB SALVAGE USING HOMOGRAFT VESSELS

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Objectives: Autologous greater saphenous vein (GSV) is the ideal graft for infrainguinal arterial reconstruction in the cases of threatened limbs. If this vein is not available because of previous operations or the size or quality of vein is not satisfactory, implantation of deep frozen homologous artery or vein may offer a therapeutic option. Graft patency and limb salvage rate were examined in our tertiary academic center in a ten years period (1997-2007).

Methods: In our department we have been operating a homograft bank since 1997 and in ten years we implanted 84 homografts in 72 patients for threatening limb ischemia. The average number of previous operations were 2.6 operations/patient. Single run off vessel was documented in 58, two vessel run off was seen in 14 patients. Fifty-five patients had gangrene, 17 patients had rest pain. Twenty-two patients' saphenous vein was already used at the time of previous surgeries, in the other cases GSV was found to be unsuitable for graft creation by preoperative examination or at the time of surgery. Femoro-popliteal supragenaal bypass was performed in four cases, in 10 cases infragenaal femoro-popliteal bypass and in 58 cases femoro-crural bypass was created.

Results: In-hospital mortality was 1.2%, 30 days mortality was 3.6%. Peripheral pulse returned in 34 cases. Early reocclusion was diagnosed in 7 cases (8.3%), 21 other grafts occluded in the follow-up period (25%). Successful reoperation was performed in seven cases and in two cases thrombolysis saved the graft.

Conclusions: Life table analysis showed a 66% limb salvage rate and a 53% secondary patency rate at three years. No statistical difference was noticed when we analyzed the possible difference between artery and vein and ABO blood group crossmatching. Based on our data homograft blood vessel

implantation is a good option to save threatened limbs in Fontaine III-IV stages.

VP54

THE USE OF HIGH SENSITIVITY C-REACTIVE PROTEIN AND ADIPONECTIN AS BIOMARKERS FOLLOWING ENDOVASCULAR REVASCULARISATION FOR LOWER LIMB PERIPHERAL VASCULAR DISEASE

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Objectives: Current assessment of the treatment of peripheral vascular disease utilising Ankle Brachial Pressure Index is subject to limitations. Adiponectin is an adipocyte derived peptide that is thought to be involved in the development of atherosclerosis. High sensitivity CRP (hsCRP) are known to be associated with inflammatory conditions such as those responsible for atherosclerosis. This pilot study examines if circulating levels of these two biomarkers correspond to the changes in Ankle Brachial Pressure Index noted after patients have undergone endovascular revascularisation.

Methods: Venous blood samples were obtained and Ankle Brachial Blood Pressure Indices were measured before patients underwent lower limb endovascular procedures. Blood samples were taken and Ankle Brachial Pressure Index were repeated 12 h post procedure. hsCRP and Adiponectin were measured via competitive enzyme-linked immunosorbent assay (ELISA).

Results: Ten patients (6 males: 4 females, Average age 71.2 years) underwent percutaneous angioplasty. All patients had Rutherford category four ischaemia with the target lesions classed as Trans Atlantic interSociety Classification (TASC) grade B lesions. An increase in ABPI was noted after the procedure (Standard deviation=0.067, $P<0.0001$). Likewise there was a significant increase in post procedure hsCRP (Wilcoxon's signed ranks Two sided $P=0.027$). In comparison there was no significant change in Adiponectin levels (Wilcoxon's signed ranks test Two-sided $P=0.0537$).

Conclusions: Changes in hsCRP protein correlate with an increase in Ankle Brachial Pressure in individuals who have undergone endovascular angioplasty. In keeping with its proposed role as an atheroprotective molecule, Adiponectin levels did not show an immediate change in circulating levels.

VP55

IMPORTANCE OF ILOPROST IN THE TREATMENT OF BURGER'S DISEASE

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Objectives: Burger's disease is a disorder starting with distal vessel involvement in young male smokers between ages 25-35. There is no clear therapy except smoking cessation for Burger's disease. Iloprost is a prostacyclin analogue which increases microvascular blood flow and inhibites platelet aggregation. We investigated the effects of iloprost on improvement, pain relief, decrease of analgesic neccessity and amputation in patients with Burger's disease.

Methods: Iloprost treatment had been given to 30 male patients with Burger's disease between january 2004-december 2007. Patients mean age was 36.8 (± 5.47) years. Diagnosis was made by physical examination and peripheral angiography. Iloprost was started at the dosage of 0.5 ng/kg/min and gradually increased to 3.0 ng/kg/min. Iloprost therapy was given for four weeks (6 h in 5 days of a week). No intolerable side effects were seen. Pain scoring value, wound diameter measurement in patients with ulcer and ABI measurement was evaluated before treatment and one and six months after treatment. Previous surgical intervention history was evaluated. Fifteen patients (5 in right foot, 8 in left foot and 2 in both feet) had ulcers before therapy. Minor amputation to four patients, sympathectomy to three patients and femoropopliteal by-pass surgery to two patients had been performed in other clinics.

Results: Complete recovery was observed in 26 patients (85.7%) and partial recovery was observed in four patients (decrease in ulcer diameter in three patients and finger (toe) amputation in one patient) after treatment. Fourteen patients, including all of four patients with partial recovery had continued smoking during therapy. There was significant increase in mean ABI and significant decrease in pain scores of patients in the post first and sixth months of therapy.

Conclusions: Iloprost seems to be a reliable alternative in the treatment of Burger's disease by decreasing rest pain, analgesic usage, ulcer diameter and amputation rate.

VP56

THE USAGE OF ILIOMEDIN IN CRITICAL LEG ISCHEMIA

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Objectives: We have investigated the effects of ilioprost on critical leg ischemia, recovery in ulcer, removing the pain and decreasing the level of amputation.

Methods: Between January 2004 and December 2007 years ilioprost treatment was applied to 21 men, 7 women and 28 occlusive arterial patients. The average age of the patients were 62.4±5.86. Seventeen patients who had diabetic wounds were examined in a separated group. Diagnosis was made by PE, colored Doppler USG and peripheral angiography. Iloprost was started at the dosage of 0.5 ng/kg/min and gradually increased to 3.0 ng/kg/min. Iloprost therapy was given for four weeks (6 h in 5 days of a week). Pain scoring value, wound diameter measurement in patients with ulcer and ABI measurement was evaluated before treatment and one and six months after treatment. In diabetic group ulcer wounds were localized on both feet of four patients, on right foot of five patients, on left foot of eight patients. In non-diabetic group ulcer wounds of two patients were localized on right foot, on left of four patients and on right hand of one patient.

Results: After ilioprost treatment, in diabetic group complete progress in 12 patients (70.59%), partial progress in three patients (17.65%) were seen. At the end of the sixth month no progress in ulcer of two patients was seen (11.76%) and the treatment has been accepted as unsuccessful. In non-diabetic group complete progress in 6 patients (54.5%), partial progress in 2 patients (18.1%) were determined. At the end of the first month the treatment had been unsuccessful in three patients. (major cnemis amputation in 2 patients, subintimal angioplasty in 1 patient) Increasing in the average ABI and decreasing in pain scoring of the patients were seen between the first and sixth month data.

Conclusions: Iloprost can be an option to use in treatment, because of the reasons to reduce the general mortality ratio and amputation nearby lessening the ischemic ulcer lesion and recreation pain and compensating the analgesic necessity in critical leg ischemia.

VP57

ANEURYSM IN A PERSISTANT SCIATIC ARTERY

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Objectives: The incidence of a persistent sciatic artery has been estimated as low as 0.025% to 0.04%. This artery is prone to atherosclerotic change and is associated with aneurysmal change in 46.1% of the cases; these cause a painful or painless pulsatile mass, distal embolization, sciatic neuropathy, or rupture. We present a case with aneurysm in persistant sciatic artery.

Methods: A 59-year-old male admitted us with a pulsatile mass on right gluteal region one month after a trauma. As we confirmed that all parameters are normal with the routine medical follow-up, we performed an aorto-peripheral angiography. The distal abdominal aorta and common iliac arteries were anatomically normal. We realised that the right iliac artery was hypoplastic with 50% stenosis. In the right lower extremity the common femoral artery and superficial-profunda femoral arteries were hypoplastic. Internal iliac artery was wider than its normal size with a 6 cm.s aneurysmatic dilatation about 3-5 cm.s distal to the bifurcation. The artery was anatomically passing through the gluteal region and in the posterior femoral region continuing as popliteal artery just before the trifurcation. This anatomic variation showed us the persistant sciatic artery.

Results: We performed the surgery after the routine perioperative medical follow-up under general anesthesia. We used the classic right paramedian oblique abdominal incision and another incision between right m. Biceps femoris and m.vastus lateralis. We performed a bypass surgery between right common iliac artery and right sciatic artery before we ligated the internal iliac artery distally to the proximal anastomosis and sciatic artery proximally to the distal anastomosis. The patient was transferred to the postoperative intensive care unit after the surgery and to the vascular surgery clinic on postoperative 1st day. He the was discharged on the post-operative day 7 without any problem.

Conclusions: Persistent sciatic artery is prone to early atherosclerotic degeneration and aneurysm formation in up to 44% of cases. Even if the exact cause of aneurysm formation is unclear, predisposing factors are a congenital hypoplastic vessel wall with reduced elastic elements and exposure of the artery to

frequent and repeated trauma in the gluteal region. Aneurysms can be treated by ligation, by excision or by endovascular approach. The revascularization of the lower limb is crucial as in persistant sciatic artery cases as femoral arterial system may be hypoplastic.

VP58

ADAPTATION AND DEADAPTATION OF PERIPHERAL BLOOD CIRCULATION IN PATIENTS WITH CHRONIC ARTERIAL INCOMPETENCE

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Objectives: For today there are no estimation criteria of adaptation and deadaptation of the peripheral blood circulation in patients with chronic arterial incompetence. In connection with that, risk criteria of the operation and prognosis of disease in early and late postoperative period are not determined. The aim of research: Taking into consideration regulation mechanisms of peripheral blood circulation and basing on up to date diagnostic methods (assessment of blood circulation, blood pressure, SaO₂ and SaCO₂ in tissues considering values of pump function of the heart and system blood pressure) is to create a method of dose-dependent physical exercise tests for blood circulation reserve estimation in patients with arterial incompetence.

Methods: Materials and methods: 14 patients were examined with different localization of lower limbs artery disease, with the II-III stages of chronic arterial incompetence according to Fontain-Pokrovsky classification, painless walks distance of patients was 40-120 metres, they had minimal trophic changes according to Fontain-Pokrovsky classification five patients were considered to be at the IIB stage; 9- at the III stage of chronic arterial incompetence. Duration of the disease was 4-16 years. All patients have gone through engineering construction with angiogenic gene by intramuscular injections in tibial muscle group of the limb, three times in equal doses once per three days. Exercise test was performed before and after 6 and 22 months. Peripheral hemodynamics were valued by registration of lineal circulation velocity in peripheral arteries by ultrasound (BIOS), duplex scanning on the Logiq 7 (GE). Results were compared with X-ray contrast angiography of lower limbs data. Exercise test was performed in three stages according to our programme: rest-exercise test-recovery. Patients statistically were divided in two groups depending on their painless walk distance. The 1st group consisted of four patients with painless walk distance 100 metres and more, the second group-10 patients with painless walk distance <100 m. We analyzed the data of pressure indexes and pressure gradients in research groups before and during the treatment.

Results: Results: Basing on the research results we created an algorithm of lower limbs arteries complex investigation statistical analysis confirmed high diagnostic sensitivity (97%), specificity (98%) and high prognostic value (100%) of proposed method.

VP59

THE PROTECTIVE EFFECT OF ERYTHROPOIETIN ON RENAL INJURY INDUCED BY ABDOMINAL AORTIC-ISCHEMIA-REPERFUSION IN RATS

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Objectives: Renal injury induced by aortic ischemia-reperfusion (IR) is an important factor in the development of postoperative acute renal failure following abdominal aortic surgery. The purpose of the study is to examine the effect of erythropoietin on renal injury induced by aortic IR in rats.

Methods: Twenty-four Wistar-Albino rats were randomized into three groups (eight per group). The control group underwent laparotomy and dissection of the infrarenal abdominal aorta (IAA) without occlusion. The aortic IR group underwent clamping of the IAA for 30 min followed by 60 min of reperfusion. The aortic IR+erythropoietin group underwent the same aortic IR periods and was pretreated with 1000 U/kg subcutaneous erythropoietin 5 min before ischemia. In rat kidney specimens, tissue levels of malondialdehyde (MDA), superoxide dismutase, catalase and glutathione peroxidase were measured. Histological evaluation of the rat kidney tissues was also done.

Results: Aortic IR significantly increased the levels of MDA and superoxide dismutase ($P < 0.05$ vs. control). Erythropoietin significantly decreased

the levels of MDA, superoxide dismutase and catalase ($P < 0.05$ vs. aortic IR). Histological evaluation showed that aortic IR significantly increased ($P < 0.05$ vs. control), whereas erythropoietin significantly decreased ($P < 0.05$ vs. aortic IR) the focal glomerular necrosis, dilatation of Bowman's capsule, degeneration of tubular epithelium, necrosis in tubular epithelium, interstitial inflammatory infiltration and congestion of blood vessels.

Conclusions: The results of this study indicate that erythropoietin have protective effects on renal injury induced by aortic IR in rats. There are two main findings supporting this suggestion. First, erythropoietin significantly decreased the tissue levels of MDA, superoxide dismutase and catalase. Second, erythropoietin significantly attenuated the histopathological changes associated with aortic IR-induced-renal injury. In conclusion, the result of our study suggest that erythropoietin have protective effects against renal injury induced by aortic IR, and this cytoprotective effect may be primarily due to its antioxidant properties.

VP60

LEUKOCYTE ACTIVATION AND REDOX CHANGES FOLLOWING AORTO-BIFEMORAL BYPASS SURGERY.

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Objectives: While aorto-bifemoral bypass (ABP) surgery is a routine intervention, the postoperative complications mainly depend from the operation stress, and the tolerance of the patient. During due to the cross-clamping and the aorta a mass of peripheral skeletal muscle is suffering from ischaemic-reperfusion injury (IRI). A whale of evidences point to oxidative stress, as an important trigger in the complex chain of events leading to reperfusion injury. In the present study the authors aimed to examine the oxidative stress parameters, the antioxidant-prooxidant state and the expression of leukocyte adhesion molecules (CD11a and CD18) following aorto-bifemoral bypass surgery.

Methods: Sixteen patients, underwent an ABP surgery, were examined in the prospective randomized study. Peripheral blood sample collection was before the operation (ischaemic period), and after the reperfusion in the 2nd and 24th h, and on the 7th day. For monitoring the cellular oxidative stress plasma superoxide-dismutase (SOD) activity, reduced glutathion (GSH) concentration, and total thiol (SH) group concentration were measured. The degree of lipidperoxidation was marked with the quantity of malondialdehyde (MDA). For characterize the inflammatory response the plasma myeloperoxidase (MPO) level, leukocytes free radical production, and the expressions of leukocyte adhesion molecules (CD18, CD11a) were measured.

Results: Our results showed, that the speed and rate of free radical production significantly increased in the early reperfusion ($P < 0.05$). The level of the antioxidant enzymes decreased after the revascularisation. The CD11a and CD18 expression of the granulocytes significantly ($P < 0.05$) decreased right after the revascularisation, but with a gradual elevation, until the 7th day they exceed the ischaemic value.

Conclusions: Our results showed the turnover of the sensitive antioxidant-prooxidant balance after ABP operation. The critical period for systemic inflammatory response is the first 24 h, but increased leukocyte activation could be detected still the end of the first week. Supported by OTKA K67731, K48851, K60227 grants.

VP61

STUDY OF THE EFFECTS ON THE ARTERIES OF HORMONAL TREATMENT

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Objectives: The menopause is a very special stage in the woman where changes happen from the metabolic and hormonal point of view that to entail deep alterations in some cases of positive character for the woman and in others being developed deep organic and functional alterations. The relations between menopause and possible alterations at level of the cardiovascular system have been reviewed by great number of authors, being the relations of but varied and go from the relation of menopause and disease cardiac, to the possible connection of estrogens with the atherosclerotic disease or to the generic cardiovascular risk without needing, referenced by other authors. The authors have an experimental study in the rat for

evidenced the changes what the treatment with females hormones o ovaries transplant have in the wall of the aorta artery.

Methods: The study is make with histological and morphometric techniques. The first group constituted 15 rats to which a simple ooforectomy of the attached one was practiced them straight, being to the three months sacrificed and obtained the samples due to the operation of the attached rest we will call group to him normo functioning control (Group I). The second group constituted rats to which in a first surgical time a total castration was practiced them. To the three months one sacrifices the animals and one obtains the samples. It is the castrated group (Group II), also constituted by 15 units.

Results: In the arterial pathologic study are not showy differences between the groups. A good disposition of the festooned one of elastic fibers exists. It is not appraised increase of the collagen weave nor processes related to the atheromatosis. Inflammatory phenomena nor changes in the cellular composition are not appraised either.

Conclusions: Could be concluded affirming, that in our work, we did not find significant differences in the morphometry of the blood vessels between the groups, because possibly it is necessary more time so that changes or to that take place are necessary helping factors in addition to the loss of the ovarian function. We found significant differences in the thickness of the average layer, which indicates that the hormonal factor influences the muscular fiber of the artery.

VP62

INFLUENCE OF SIZE TYPE II ENDOLEAK ON ENDOVASCULAR ABDOMINAL ANEURYSM REPAIR FOR MEASURING INTRASAC PRESSURE

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Objectives: The authors have experimental study in the pig with the purpose of evaluation of the monitoring of the intrasac pressure in the abdominal aortic aneurysm for telemetry before and after the endovascular treatment of the aneurysm sac.

Methods: The study is performed in pig after of the creation artificial aneurysm in the abdominal aorta with the implantation a sensor pressure for telemetry in the sac. After a month, all the animals are re-opened and implantation a wall graft device, a half of the animal with a hole of different sizes in the wall for performed a Type II endoleak. Every week for three months, all animal are examined and measured and registration the values systemic and abdominal aneurysm intrasac of the systolic pressure.

Results: Increase of the size of the holes of the endoprotheses as model of endoleak was significantly associated with a proportional increase of the intrasac pressure. The flow was statistically greater when the hole was superior to 2 mm of diameter was and the relations.

Conclusions: This model confirmed that greater size of the hole as endoleaks increase the endotension and intrasac pressure.

VP63

HISTOLOGICAL CHANGES IN THE THORACIC AORTA AFTER THE INTRALUMINAL DISTENSION. EXPERIMENTAL STUDY IN THE RABBIT

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Objectives: Understanding the effects of the transversal elongation o distension in the wall artery is very important to now the different circumstances in various situations of the pathology arterial vessels in divers situations as the injury of the artery and others circumstances.

Methods: An experimental study is performed for evaluation of the effects of aorta distension in the rabbit. The group with injured artery distension is compared with a control group with sham-operation. Histological and ultrastructural findings in experimental group were compared with those in untreated in the thoracic aorta artery with the evaluation of the images of the arterial wall in the intimal, muscular and adventitial zones. The light microscope study is made with standard methods an eosin-hematoxililn and Masson trichrome stain was performed in the specimens. The electron microscopy study also is development with standard procedure.

Results: Changes in the wall of the artery are detected in the structure of the wall. The intima and muscular layers are the structures with big alterations in the transversal direction. The adventicia layer, have few

alterations and your disposition is same in the experimental and control groups. Collagen structure and degradation of elastin is more important after distension of the wall in the muscular layer.

Conclusions: The repercussion of the transversal distension of the aorta is very important in the intima and muscular layers of the aorta with reconstruction with collagen tissue of the wall.

VP64

ILOPROST ATTENUATES SKELETAL MUSCLE INJURY INDUCED BY ABDOMINAL AORTIC OCCLUSION-REPERFUSION IN RATS

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Objectives: We aimed to examine the effect of iloprost on aortic-ischemia-reperfusion (AIR) induced skeletal muscle injury in rats.

Methods: Twenty-four Wistar-Albino rats were randomized into three groups (eight per group). Control group underwent laparotomy and dissection of the infrarenal abdominal aorta (IAA) without occlusion. AIR group underwent laparotomy and clamping of the IAA for 120 min followed by 120 min of reperfusion. AIR+iloprost group received 0.45 µg/kg/hr iloprost by constant intravenous infusion via tail vein during 120 min of reperfusion. Blood and gastrocnemius muscle tissue samples were obtained for biochemical and histopathological analysis from all rats, respectively.

Results: Biochemical analysis showed that, in the AIR group, plasma levels of malondialdehyde, creatine phosphokinase, P-selectin, vascular cell adhesion molecule-1 (VCAM-1) and intercellular adhesion molecule-1 (ICAM-1) were significantly higher than in the control group ($P<0.05$). In the AIR+iloprost group, plasma levels of malondialdehyde, creatine phosphokinase, P-selectin and ICAM-1 were significantly lower than in the AIR group ($P<0.05$). Histopathological examination showed that, in the AIR group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor-alpha, CD11b, CD18, ICAM-1 and cyclooxygenase-2 were significantly higher than in the control group ($P<0.05$). In the AIR+iloprost group, immunoreactivity of P-selectin, L-selectin, tumor necrosis factor-alpha, CD18 and cyclooxygenase-2 were significantly lower than in the AIR group ($P<0.05$).

Conclusions: The results indicate that, iloprost attenuates AIR induced skeletal muscle injury in rats. This beneficial effect of iloprost is due to down-regulation of expression of adhesion molecules, inhibition of leukocyte infiltration into skeletal muscle tissue and reduction of lipid peroxidation.

VP65

POSTMASTECTOMY LYMPHEDEMA - POSSIBILITIES OF PROGNOSIS OF ITS DEVELOPMENT

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Objectives: Development of postmastectomy lymphedema of the upper limb is usually explained by certain risk factors such as axillary surgery, radiotherapy, obesity, venous outflow obstruction, delayed wound healing, and infection. According to published reports, the incidence of lymphedema of the arm in patients with cancer of the breast, treated by surgery, varies from 5 to 50%. The objective of the current study was to evaluate efficiency of lymphoscintigraphy in identifying those risk factors that might result in secondary lymphedema after treatment for breast carcinoma in a large patient series.

Methods: Using dynamic lymphoscintigraphy we performed intravital visualization of functionally active lymph collectors of 600 upper extremities: 300 in healthy subjects, 80 in patients with different stages of breast cancer before treatment, 70 in operated patients without postmastectomy edema, and 150 - in operated patients with postmastectomy edema of the upper extremities. Among the patients with lymphedema transient edema (I stage) was diagnosed in 16.5% of the cases, soft edema (II stage) in 52.1%, firm edema (III stage) in 27.3% and elephantiasis (IV stage) in 4.1%.

Results: The following three principal variants of the normal lymph flow were revealed in the healthy subjects: collector pattern (in 62% of the women), diffuse pattern (in 18%) and nodular pattern (in 20%). In patients which undergone radical mastectomy collector pattern of lymph flow was found in 56.2% of the cases. On the scintigrams of those of them, who had postmastectomy lymphedema, were seen 'cut off' main lymph vessels and diffuse accumulation of the radiotracer. Diffuse pattern of lymph flow was diagnosed in 10% of

treated patients without edema and in 42% of the women with postmastectomy edema. Nodular pattern was registered in 25% of patients without edema and practically was not met in patients with edema.

Conclusions: Diffuse pattern of lymph flow indicates low compensatory possibilities of lymphatic system of the extremity and could be estimated as an unfavorable prognostic sign. In these patients complex conservative treatment should be started in advance, before clinical appearance of the edema. On the contrary, collector and nodular patterns indicate ability of lymphatic system to provide drainage of the lymph via additional collateral net and are good prognostic signs.

VP66

CEPHALIC TO JUGULAR VEIN BYPASS AS NEW TREATMENT FOR VENOUS HYPERTENSION DUE TO SUBCLAVIAN VEIN THROMBOSIS IN PATIENTS WITH BRACHIAL ARTERIOVENOUS FISTULA

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Objectives: The introduction of percutaneous dialysis catheter placement in the subclavian vein for temporary dialysis has contributed to the high incidence of occlusion or thrombosis of subclavian vein. In the setting of functioning ipsilateral brachial arteriovenous fistula, venous hypertension symptoms may be exacerbated. We studied the use of cephalic to jugular vein bypass in six cases of subclavian vein obstruction associated with upper extremity venous hypertension as a new alternative treatment for this disease.

Methods: Six 37- to 60-year-old patients (5 males and 1 female) were studied. All patients had severe swelling of upper extremity (like elephantiasis) because of venous hypertension due to subclavian vein occlusion. They had previously undergone placement of temporary subclavian vein dialysis catheters. A 8 mm polytetrafluoroethylene (GoreTex) graft was used to anastomose cephalic vein to internal jugular vein (4 cases), anterior jugular vein (1 case) and external jugular vein (1 case).

Results: All patients had complete resolution of symptoms within one week after surgery, without any morbidity or mortality. No symptoms of elevation of intracranial pressure occurred except headache in one patient that relieved spontaneously. Bypass grafts had remained patent, allowing the grafts to provide functional access for 3-18 months after surgery.

Conclusions: Regarding the costs and major complications of balloon angioplasty or transluminal stenting, this approach may be a good alternative operation to treat venous hypertension and preserve of dialysis fistula and provide a functional access for dialysis in patients suffering from chronic renal failure.

VP67

RESULTS OF CONSERVATIVE TREATMENT OF THE ISCHEMIC DIABETIC FOOT

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Objectives: All over the world the number of patients with combination of threatening ischemia of the lower extremities and diabetes mellitus continuously increases. It is well known that in case of development of ischemic infected deep ulcers these patients become candidates to major amputation. The aim of this study is to describe the outcomes of conservative treatment of 21 patients (mean age 61.8±5 years) with 36 chronic ulcers and confirmed (by Duplex scan and/or angiography) occlusion of the both tibial arteries of the same leg that were followed in our clinic during period of nine months or more (13.5±6.2 months). In 30% of these patients peripheral diabetic neuropathy was diagnosed.

Methods: To achieve the best results we have developed the following protocol of treatment: aggressive surgical debridement to remove all necrotic and infected tissues, regular and careful treatment of the ulcer surfaces using antiseptics and wound healing stimulators; heavy antibiotic therapy and vasoactive drugs in combination with regular walking exercises. Some of the patients were treated using intravenous infusions of 'Cytoflavin' (combination of succinic acid, inosine, nicotinamide and riboflavin).

Results: In spite of the fact that in all of the patients the Ankle Brachial Index was below 0.7 (close to critical ischemia) healing of wounds has been recorded in 19 of the 21 patients. Duration of treatment in these patients was from 1.5 to 7 months. In the patients with peripheral diabetic neuropathy treated with Cytoflavin neurological symptoms decreased very significantly and surprisingly quickly.

Conclusions: Our results show that this complex multidisciplinary approach with a very motivated and skilled team allows to get the best results in treatment and saving of affected legs that otherwise would have been amputated. Initial results of using Cytoflavin for treatment of the diabetic foot patients seem to be very promising.

VP68

TISSUE-ENGINEERED VALVE: FROM RESEARCH TO CLINICAL PRACTICE. OUR PRELIMINARY EXPERIENCE

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Objectives: Bioengineered heart valves and vascular conduits - involving the reconstitution of viable tissue with the use of autologous cells grown on 3D scaffolds - promise to be the ideal cardiovascular replacement graft. They have the potential to grow and repair within the host, to minimize inflammatory and immunological responses and to limit thromboembolism. We study a decellularized extracellular valve matrix from human and animal (goat and/or sheep) valves/vessels as a leading structure for cells recellularization conducted in a bioreactor. This study presents our first research efforts in the design of a bioengineered graft with a different decellularization protocol evaluation.

Methods: We developed a new kind of bioreactor to improve conduit engraftment and in vitro dynamic reseeding with allogeneic pre-expanded cells. We compared different decellularization protocols for efficiency of complete cell removal. Animal and human aortic valve leaflet and aortic root wall specimens were acellularized with trypsin-EDTA, sodiumdodecylsulphate, or tert-octylphenyl-polyoxyethylene. Subsequently all specimens underwent ribonuclease digestion. Standard histological staining with Hematoxylin and Eosin served to determine presence/loss of nuclear structures and histochemistry was used to address changes in extracellular matrix constitution.

Results: The acellularization procedures with trypsin-EDTA and sodiumdodecylsulphate resulted in an almost complete removal of cells regarding both animal and human aortic valve leaflets but showed incomplete cell loss regarding the aortic wall. Subsequent added ribonuclease digestion determined complete cell extraction in all specimens, but led to a substantial leaflet extracellular matrix degradation. Peculiar characteristics of our bioreactor prototype regarding mechanical conditioning and culture chamber assembling system allowed a continuous and lasting graft mechanical stimulation.

Conclusions: An effective acellularization procedure should be developed while maintaining the structural integrity of the original matrix architecture. We intended to investigate the potential of mesenchymal cells reseeding in an intramural position as well as endoluminal re-endothelialization via bioreactors and culture conditions that permit the required luminal and intramural seeding process of such a valve/tube structure.

VP69

THE LEVEL OF HEAT SHOCK PROTEIN 70 IN ABDOMINAL AORTIC WALL IN DIABETIC RATS

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Objectives: Heat shock proteins have important roles in protecting cell nature. Heat shock protein 70 (HSP 70) increases in cardiovascular system pathologies. Diabetes is also a leading cause of death in vascular pathologies. In our study we tried to investigate prospectively the role of diabetes mellitus directly on the vascular wall, and the difference of (HSP 70) levels in the serum and abdominal aortic wall in the of streptozotocin-diabetes rats.

Methods: This study involved 16 males Sprague Dawley rat. The animals were divided into two groups as the control group and the diabetic rats group. We used streptozotocin injection intraperitoneally in rats to induce hyperglycemia. Rats were sacrificed after two weeks resulting the side effects of diabetes. The infrarenal abdominal aorta were resected for histopathologic assessment. The level of HSP 70 was detected in serum and the tissue.

Results: There was a substantial increase in blood levels and intracellular levels of HSP 70 in the streptozotocin-diabetes rats. Additionally, the degree of vascular injury caused by diabetes was correlated with the tissue and blood levels of HSP 70.

Conclusions: Heat shock protein 70 is a special protective molecule for cardiovascular system. Serum and tissue levels of this protein increases in atherosclerosis, hypertension and ischemic heart disease. In our study the results indicate that HSP 70 level increases in diabetes which plays a major role for vascular pathologies.

VP70

CHEMICAL PROFILING OF VASCULAR ULCERS BY DETECTION OF VOLATILE ORGANIC COMPOUNDS USING A NOVEL GAS CHROMATOGRAPHY-ION TRAP MASS SPECTROMETRY AND CHROMATOGRAPHIC VISUALISATION

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Objectives: Vascular ulcers in the form of leg ulcers are highly prevalent, affecting more than 1% of the adult population of developed countries and expensive both in financial costs and in the psychological pain. Volatile organic compounds (VOCs) emanate from human skin and are altered by changes in the body's metabolic or hormonal state, in its external environment and in the bacterial species colonising the skin surface.

Methods: VOC profiles from five patients with arterial leg ulcers were sampled using a modified silicon skin-patch method, analysed by thermal desorption coupled to gas chromatography-ion trap mass spectrometry (GC-ITMS) and data analysed using multivariate analysis (MVA) and direct chromatographic visualisation (DCV). In each subject healthy skin, affected skin within the ulcer and the boundary between these two areas were sampled and the VOC profiles compared.

Results: Discrimination was achieved between the healthy skin and boundary and between healthy skin and lesion sampling areas using principal component analysis (PCA). DCV suggested possible species associated with each area.

Conclusions: This novel method was successful in collecting VOCs from human skin and in separating the samples into the three sampling areas of healthy skin control, boundary area and skin affected by a vascular leg ulcer of arterial aetiology.

VP71

INTRAVENOUS PAMIDRONATE FOR THE TREATMENT OF REFRACTORY LYMPHEDEMA

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Objectives: Lymphedema generally defined as an excessive regional accumulation of protein-rich fluid in the extravascular interstitial spaces as a consequence of impaired lymphatic drainage. The standard treatment of extremity edema has been established as the use of compression garment, exercise, and acknowledgment about skin care. A new treatment for refractory lymphedema can be PAM (PAM) that is not investigated yet. PAM is used for reflex sympathetic dystrophy and reduces their pain and swelling. We tried to assess the effectiveness of PAM on lymphedema and its possible side effects.

Methods: We studied 12 cases of lymphedema; 11 patients with unilateral leg lymphedema and one patient with upper limb lymphedema. All patients had refractory chronic lymphedema. They received pamidronate monthly for three consecutive months. They were followed by evaluating discomfort with visual analog scale (VAS) and physician global assessment based on objective signs or clinical evaluation (limb volume, limb circumference, skin temperature).

Results: The limb volume, limb circumference, and patient satisfaction of the patients were improved significantly. Pretreatment median VAS score was eight and considerably decreased to two following treatment with PAM that was statistically significant ($P=0.001$). No serious side effects were reported and calcium levels and mineral salts were not changed considerably after administration of PAM.

Conclusions: Our results show that PAM has exciting effects on lymphedema when is added to conservative treatments and it especially improves patient's comfort and reduces their limb volume.

VP72

SERUM PROTEINS ASSOCIATED WITH EXPANSION OF ABDOMINAL AORTIC ANEURYSMS IDENTIFIED BY PROTEOMIC ANALYSIS

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Objectives: Aneurysms of abdominal aorta (AAA) are usually asymptomatic until they reach a large size where they may rupture. Identification of new predictors of the expansion of small AAA might give us further pathophysiologic insight and a more nuanced indication for surgery.

Methods: We have applied two-dimensional gel electrophoresis (2D PAGE) followed by mass spectrometry (MS) and database search to identify proteins in patients with different AAA expansion rate. We hypothesized that these proteins might be involved in AAA development, progression and rupture. Sera from 15 cases of asymptomatic AAA were used. These cases had undergone surveillance in the Viborg Aneurysm Screening Study, and referred to surgery because of expansion to above 5 cm in maximal diameter. Mean annual expansion rate was calculated. Samples were analyzed for protein composition by 2D PAGE. Analysis of protein spots was performed using Melanie II analysis software. Spot intensities were expressed as relative volumes in percentage (%VOL) by integrating the optical density in the spot area (VOL) and dividing with the sum of volumes of all spots detected in the gel. These data were exported to Excel for further statistical analysis. Correlation was calculated using SPSS 10.0 statistical package for Windows and non-parametric Spearman correlation coefficient was used. Comparisons were made, $P < 0.05$ was considered statistically significant. Only well focused spots were considered. Protein spots that showed significant correlation were excised from the gel and subjected to in-gel tryptic digestion for identification by tandem MS.

Results: Fifteen protein spots in AAA showed strong positive or negative correlation with AAA expansion rate. Twelve proteins spots were identified. A significant positive and negative correlation were found concerning Albumin; in two spots ($r = 0.82$, $P = 0.004$) and in four spots ($r = -0.8$, $P = 0.005$). Six proteins in nine spots were identified; significant negative correlations were found concerning Antithrombin III ($r = -0.77$, $P = 0.009$), Ig alpha-2 chain C region ($r = -0.76$, $P = 0.01$), Fibrinogen gamma ($r = -0.65$, $P = 0.042$), Hemaglobin B ($r = -0.606$, $P = 0.042$), Alfa 2-HS glycoprotein ($r = -0.73$, $P = 0.004$) and in two spots Haptoglobin 1 ($r = -0.648$, $P = 0.043$ and $r = -0.640$, $P = 0.046$).

Conclusions: AAA expansion rate was significantly correlated to changes in amounts of a set of proteins in the sera which may be related to relationships between blood coagulation and the fibrinolysis system and morphology of AAA.

VP73

THE COMPARISON OF INTRALUMINAL WITH INTRAVENOUS ADMINISTRATION OF ANTIBIOTICS IN PERMANENT HAEMODIALYSIS CATHETER ON THE RATE OF CATHETER REMOVAL

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Objectives: Permcath infections can lead to catheter removal in haemodialysis (HD) patients. This is an important factor in morbidity and mortality of the patients. Successful use of a 'locked-in' antibiotic to treat unusual gram-negative and more common organisms has reported good results in catheter infections. This study was designed to evaluate the impact of the intraluminal vancomycin in comparison with intravenous antibiotic administration.

Methods: This prospective experimental controlled study included 52 (32 males and 20 females) end-stage renal disease (ESRD) patients of diverse etiology enrolled for long-term HD from July 2004 to June 2007 at our tertiary care hospital. Those patients requiring permcath insertion for the maintenance or commencement of HD were eligible for the study. We exclude them, if they have allergy to vancomycin in the intervention group. The patient was divided to two groups. In the first group, 500 mg vancomycin (in 100 cc N/S 0.9%) that was injected 50 mg in each lumen of permcath (each 48 h), with one group IV Ceftriaxone (each 12 h) for seven days, and then oral antibiotics was administered according to the culture. In the second group the routine intravenous antibiotic (Vancomycin, Ceftriaxone±Amikacin) prescribed with the observation of nephrologists. Our endpoint is to assess-ment of catheter removal. At the end, both groups compare by K-square to determine the effect of methods on catheter removal.

Results: Patients characteristics (age, time of insertion of the catheter and number of dialysis per week) didn't differ between two groups. Of 28 patients in group 1, 1 catheter removal, and of 24 patients in group 2, 13 catheter removals were done. There is a significant reduction of catheter removal in the first group ($P < 0.001$).

Conclusions: This study has shown that intraluminal administrations of Vancomycin is more effective than intravenous, and reduce the number of catheter removal. Such treatment may permit continued use of tunneled HD catheters for longer periods. Larger multi center blinded studies should be

done to conclude that intraluminal administration of antibiotics in permcath in HD patients is safe and more effective.

VP74

OUR CLINICAL EXPERIENCES RELATED TO E-POLYTETRAFLUOROETHYLENE GRAFT USED FOR PERFORMING ARTERIOVENOUS FISTULA IN THE PATIENTS WITH CHRONIC RENAL FAILURE REQUIRING HEMODIALYSIS

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Objectives: A arteriovenous fistula performing with e-PTFE (expanded polytetrafluoroethylene) vascular graft allows vascular access for hemodialysis where a primary fistula is not possible. We aimed to evaluate our clinical experience related to this prosthetic graft.

Methods: We performed arteriovenous fistula using e (expanded)-PTFE graft in the 35 patients with end-stage renal failure requiring hemodialysis between September 2003 and November 2007. The mean age of patients were 55.09 ± 12.2 (range, 23-74). There were 16 women and 19 men. Beforehand in all patients were performed direct arteriovenous fistula in the upper extremity and these arteriovenous fistulas wasn't functional. All patients were performed doppler ultrasound examination of the upper and lower extremity arteries and veins. The patients were used e-PTFE (Gore Intering vascular graft) graft 7 mm in diameter tapered to 4 mm at the arterial site.

Results: Between brachial artery and axillary vein in 24 patients (68.6%), between radial artery and antecubital vein in 6 patients (17.1%), between femoral artery and femoral vein in 5 patients (14.3%) were performed arteriovenous fistula. In all patients primary patency rate were 81.9%, 66.6%, and 26.6% at 6, 12, and 24 months. Secondary patency rates at 6, 12, and 24 months were 78.2%, 33.3%, and 17.6%. There were no perioperative morbidity and mortality. Mean follow-up was 27.22 ± 12.04 months (range, 2-48 months). **Conclusions:** e-PTFE grafts provide satisfactory patency rate. Preoperative doppler ultrasonography and venography examination are important for showing of probable graft configurations. Thrombosis is the most complication.

VP75

A PSEUDOANEURYSM COMPLICATION OF ARTERIOVENOUS ACCESS DIALYSIS GRAFT IN THE LOWER EXTREMITY

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Objectives: Pseudoaneurysm is a rare complication of synthetic vascular prostheses in hemodialysis patients. Rupture and life-threatening hemorrhage are the most common and dangerous complications of the pseudoaneurysm.

Methods: In this study, under the light of current literature, we aimed to present our case of successful repair of pseudoaneurysm occurred at the arteriovenous hemodialysis access graft placed between right common femoral artery and great saphenous vein six months ago.

Results: Ultrasound is useful in the evaluation of other graft or fistula abnormalities, such as pseudoaneurysm. The traditional repair of a clinically significant hemodialysis graft pseudoaneurysm is its surgical ligation or resection and it must be followed by insertion of a new interposition graft segment.

VP76

EARLY FAILURE OF ARTERIOVENOUS FISTULA FOR HEMODIALYSIS

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Objectives: Increasing use of primary arteriovenous fistulae (pAVFs) is a desired goal in hemodialysis patients. However, in many instances, AVFs fail to adequately mature due to ill-defined mechanisms. Objective is to determine the factors affecting early failure and high complication rate of AVFs.

Methods: A retrospective study was conducted analyzing data during six year period on hemodialysis patients with previously created vascular accesses at Clinical Center in Novi Sad. Five hundred eighty AVFs were analyzed. There were 216 men and 188 women, with an average age ranging from 21 to 82 years (mean age, 51.39 years).

Results: The types of procedures performed included placement of arteriovenous grafts in 12 patients, creation of AVFs in 484 patients and revision of AVFs in 83 patients.

Results: The types of procedures performed included placement of arterio-venous grafts in 12 patients, creation of AVFs in 484 patients and revision of AVFs in 83 patients.

Conclusions: Main risk factors for early failure and high complication rate included: hypotension, diabetes mellitus, cardiac disease, previous temporary catheter insertion. Autologous access is the best angioaccess for dialysis also in all groups of patients and can be performed in most patients.

VP77

CALCIUM DOBESILATE AND OXERUTIN: EFFECTIVENESS OF COMBINATION THERAPY

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Objectives: Calcium dobesilate and oxerutin are well known alternatives in the treatment of venous insufficiency. Both drugs are shown to be effective individually but the effectiveness of a combination of both drugs has not been shown yet.

Methods: One hundred and fifty patients with primary venous insufficiency were randomised into three groups: Group A receiving calcium dobesilate only, Group B receiving oxerutin only and Group C receiving both, calcium dobesilate and oxerutin. Patients were evaluated with a questionnaire before and four weeks after treatment regarding following parameters: itching, fatigue, heaviness, numbness, cramp, swelling and sensitiveness. Patients rated their symptoms from 0 to 4 (0: absent; 1: mild; 2: moderate; 3: severe; 4: very severe). Circumference of legs were measured at two levels (10 cm below the lower margin of the patella and 5 cm above the malleoli). Venous ulcer diameters were measured if present. Age, sex, body mass index, waist-to-hip ratio, smoking habit, history of hemoptysis and/or dispnea, presence of pigmentation were also recorded. Whole blood count as well as renal and hepatic function tests were performed.

Results: There was no difference regarding demographic data, statistically (Table 1). Rated values decreased more in Group A vs. Group B but most in Group C, except itching, which decreased more in Group B when compared to Group A ($P < 0.05$). Furthermore ulcer diameter reduced more in Group C, prominently (Table 2). There was no difference regarding hepatic and renal function tests as well as whole blood count before and after treatment.

Conclusions: Calcium dobesilate and oxerutin are widely used medications for treatment of venous insufficiency. Combination of both drugs revealed better results in reducing subjective symptoms. Combination therapy seems to be safe because none of the groups demonstrated prominent changes in biochemical tests. In conclusion, combination therapy was found to be more effective in the treatment of venous insufficiency. But these results should be confirmed with objective tests.

VP78

ANEURYSM OF THE INFERIOR VENA CAVA: CASE REPORT

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Objectives: Aneurysms of the inferior vena cava (IVC) are extremely rare. According to the current literature, only 29 cases of IVC aneurysms are published. We present one new case of surgically treated symptomatic sacular aneurysm of the infrarenal IVC.

Methods: Diagnosis of IVC aneurysm was made by abdominal CT scan. The operation was performed using the right retroperitoneal approach with extrapleural resection of the 11th rib.

Results: The 27-year-old patient presented with moderate lower limb swelling and mildly tender non-pulsatile mass in the right lower abdominal quadrant. Blood tests and thrombophilia screens revealed normal findings. Duplex ultrasonography showed organized thrombosis of both iliac veins. Abdominal CT scan revealed thrombosis of the infrarenal IVC and large (72x87 mm) sacular aneurysm arising from the right lateral wall of the IVC. The aneurysm displaced and compressed the right kidney, right renal artery and the right ureter and was adherent to these structures. After the opening and partial resection of the aneurysm, we found that the lumen of the entire infrarenal IVC and both iliac veins was completely obliterated with an old organized thrombus. Renal veins and suprarenal IVC were free of thrombosis, with excellent back-bleeding. After several unsuccessful attempts of iliac vein thrombectomy we concluded that IVC reconstruction was not possible. The aneurysm and the infrarenal part of IVC were completely resected

without complications. The remaining IVC was closed just below the right renal vein, preserving the venous drainage from the right kidney, and just above the iliac vein confluence. Histopathologic examination found alterations in all three layers of the aneurysm wall, with destruction of the intima and fragmentation of muscle and elastic fibres in the media. Patient completely recovered, with only mild signs of lower extremity venous hypertension. He was discharged on the eight postoperative day with anticoagulant warfarin therapy and compression stockings. During the six month follow-up no complications developed, and the leg swelling completely resolved.

Conclusions: Thrombosed IVC aneurysm may mimic a retroperitoneal tumour. In some cases, CT and MRI findings may be equivocal. Because of the low incidence of the IVC aneurysms, their natural history is not known and there are no recommendations for their treatment. Surgical treatment is indicated in all symptomatic and low-risk asymptomatic cases.

VP79

LYMPHOSCINTIGRAPHY OF UPPER AND LOWER EXTREMITIES: APPLICATION IN THE CLINICAL PRACTICE

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Objectives: Nowadays one of the most actual problem of early diagnostics of lymphedema is visualization of lymphatic structures of an extremity. It is basis for choice of the most adequate method of treatment.

Methods: lymphoscintigraphy is miniinvasive method of evaluation of lymphatic system state of extremities in case of edemas of various genesis. The procedure allows to detect intravitaly functionally full-fledged lymphatic vessels and nodes. There are two advantages of the method: 1) the only possibility of objectification of the 0 stage of lymphedema, hypo- or aplasia of lymphatic system, 2) multiple continuous control over results of treatment, 3) prognostication of lymphedema development regarding type of lymph transport. The method of lymphoscintigraphy is informative and don't have contraindications. No case of complications was fixed. The investigation in the gamma-ray chamber in the whole body scan regime provides complete view of type and intensity of lymphatic system pathology on the whole extremity's length. According to the investigation protocol, ^{99m}Tc-NANOCIS of high specific activity is introduced to a patient subcutaneously in the first interdigital space on the dorsum pedis. The dose of radiopharmdrug 150-200 MBq. Scintigrams are made in 5-20 min after the injection of drug.

Results: The results of investigation showed that there are different types of lymphatic drainage: main (collector), nodal and retrograde, and their different combinations. Collector and nodal types of lymph flow are the most favourable. The type of lymph flow allows to make a conclusion about the possibility of making lympho-venous anastomosis. Diffuse type of lymph flow is prognostically unfavourable in relation to lymphedema development and give evidence about low compensatory opportunities of lymphatic channel. As it was detected, diffuse lymph flow in extremities does not provide drainage of lymph up to the level of regional lymph nodes.

Conclusions: Retrograde lymph flow is evident sign of an obstacle to lymph movements. The sensitivity of the method according to our data is 81-87% at patients with different damages of lymphatic or venous disease, and 52% at patients with other diseases (trauma, malignant neoplasms and so on). Almost every fifth patient with diseases of venous system has not damages of lymph outflow according to scintigraphy data.

VP80

PATHOGENETICAL APPROACHES DIAGNOSTIC AND TREATMENT OF LYMPHEDEMA OF LOWER EXTREMITIES

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Objectives: There are structural changes of lymphatic stream, functional state, and the immune state of patient's organism, microcirculatory stream have very important meaning in pathogenesis of lymphedema of lower extremities. Damage of microcirculatory stream, damage of function of lymphangion and its consequential structural changes lead to progression of extremities edemas. For specification of a form and stage of the disease it is necessary

to perform a complex of diagnostic procedures (MRI, lymphoscintigraphy, laser doppler flowmetry, volumetry, lymphography, biopsy of lymphatic vessel with checking its motor activity). The evaluation of morphological and functional integrity of lymphangion, investigation of microcirculatory stream are the basis for choice of adequate pathogenetically grounded individualized approach to treatment.

Methods: experience of diagnostics and treatment of 3200 of patients with primary and secondary lymphedema of lower extremities is presented in this paper.

Results: The index of pulse harmonic/myogenic harmonic allows to diagnose the increase of tissue's edema and fibrosis on the LDF-gramm and pathological changes at different stages of lymphedema. Complex conservative treatment has foreground importance, including pharmacological, physiotherapeutical and compressive methods of treatment. The introduction of lymphotropic and endolymphatic therapy gave the biggest success. Surgical methods of treatment are used in case of secondary lymphedema with preserved contractive activity of lymphangions with application of different types of anastomoses between elements of lymphatic stream and venous system.

Conclusions: The method of LDF adequately represents the changes of human tissues hydration and may serve as a method of diagnostics of pathological changes at different stages of lymphedema. On the basis of pathophysiological and morphological investigations diagnostics schemes of patient's examination have been revised and new methods of treatment have been introduced, which allow to improve patients quality of life.

VP81

THE FIVE YEAR EXPERIENCE OF COMPLEX TREATMENT OF PATIENTS SUFFERING FROM DYSPLASIA OF SUPERFICIAL VEIN UPPER AND LOWER EXTREMITIES

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Objectives: The aims of this study were improving the results of treating the patients with this pathology.

Methods: From 2002 to 2007, 42 patients (12 males and 30 females, average age 25-year-old) were treated in our hospital. In 27 cases pathology was located only on one lower extremity, in three cases venous malformation was on both lower extremities, in 12 cases dysplastic veins located on one upper extremity. All these patients were provided with the procedure of spiral computed ascending phlebography with contrast examination of the vein, duplex ultrasound, analysis of the blood of hemostasis. After these examination 10 patients were operated and than sclerotherapy was performed, 32 patients were performed only sclerotherapy. After treatment all these patients used compressive stocking wear (II-III compression class), took phlebotonic 2-3 times a year, every course lasting 2-3 months.

Results: Thirty-five patients showed good results of treatment, seven patients satisfactory results. No cases of unsatisfactory results appeared. The criteria of assessment were: subjective improvement for the better life, decrease of symptom of chronic venous insufficiency, stabilization of pathology process, decrease of cosmetic fault. Decreasing of degree of chronic venous insufficiency from 3-4 to 1-2 was in 80% and from 2 to 1 degree in 20%. The relapse of venous trophic ulcers and bleeding from varicose vein for period examination didn't appear. Three patients were performed surgical treatment due to pain syndrome and phlebolithes in the zone of sclerotherapy.

Conclusions: The surgical treatment has been shown as the first step of treatment for removal horizontal and vertical reflux of superficial venous system in lower extremities. Choosing the method of sclerotherapy requires additional examination in system of hemostasis and individual approach to everybody. The treatment of patients suffering from dysplastic superficial veins requires stage by stage, complex approach, permanent examination in dynamics.

VP82

THE TREATMENT OF CONGENITAL LYMPHEDEMA IN CHILDREN

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Objectives: The purpose of the investigation was to improve the results of treatment of lymphedema at children.

Methods: The treatment group consisted of 38 patients with congenital lymphedema. We examined children with congenital lymphedema of upper and lower extremities 15 patients having both extremities involved, 9 only left extremities, 13-right extremities and one child upper extremity. The treatment of 7 children was started before their first year of age, 8- before their third year of life, other 23 children - after they were 12-years-old. On their first visit to a doctor 31 patients had complaints of edema of unknown origin. Edema was located on foot and lower third of shin. On the admissions to the hospital seven patients had erysipelas. Lymphoscintigraphy: Tc-99 spread in lymph nodes slowly, clear visualization of lymph nodes, which accumulated Tc-99, occurred in 5-6 h. All patients followed the course of basic therapy aimed at improving of lympho-drainage function. Children with erysipelas were given the conservative treatment after controlling over inflammation.

Results: The results were considered to be good if edema was reliably decreasing and there were no complaints of feeling of heaviness and fatigability of legs (23 patients). If edemas decreased incompletely, and some complaints remained, then the results were considered to be satisfactory (13 patients). And if there was no positive dynamics, the results were believed to be unsatisfactory (2 children). After the course of the basic therapy the patients followed the supporting therapy once semiannually.

Conclusions: Children who developed the disease after 12 years of age responded the treatment much better than those who developed it under three years of age.