67th International Congress of the European Society of Cardiovascular and Endovascular Surgery ESCVS

April 12-14, 2018 Strasbourg, France

ABSTRACT BOOK

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ABSTRACT BOOK

THURSDAY APRIL 12

SESSION: CARDIAC ABSTRACT SESSION I

TIME: 14:00-16:00
ROOM 1: FRANCE

00089

Feasibility and early outcome of semi-skeletonized internal mammary artery harvesting: a control study *versus* the pedicle one

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BACKGROUND: Semi-skeletonied internal mammary artery (IMA) is an alternative technique between the well known conventional wide pedicle one and the skeletonized. It is almost as simple as pedicle harvesting; less demanding and time consuming. More-over, it is supposed to provide the advantage of better graft length, flow, less bleeding and better early outcome. We thought to evaluate our operative and early postoperative outcome of patients with semi-skeletonized IMA (Study Group) *versus* a propensity matched similar group of patients with pedicle IMA (Control Group) in coronary artery bypass grafting Surgery
METHODS: Retrospective analysis of two groups, from Jan. 2012 to Dec.2017 in our center. (GroupI) (Semiskeletonized - IMA) (50 patients) and (GroupII) (Pedicle - IMA) (100 patients). Inclusion criteria are elective, stable, isolated conventional on-pump coronary patients. Emergency, Urgent, unstable, Off-pump and combind surgery patients are excluded for the purpose of the study. Variables used in the propensity analysis were age, sex, body surface area, New York Heart Association class, EuroSCORE II, peripheral vascular disease, chronic obstructive pulmonary disease, and left ventricular ejection fraction. The directly calculated free flow in a graded bowel before going on CPB and the Transit Time Flowmeter Measurements (TTFM) of the IMA graft at the end of operation in both groups and the amount of postoperative drainage, Need for the drains, and Blood transfusion, was considered as the primary end points. Early ICU Outcome including ventilation time, postoperative pain-need for extra-analgesia, ICU Stay and the Clinical F/U outcomes (3m.) were considered as the secondary end points
RESULTS: No significant intra-operative difference in the time needed to harvest both with complete haemostasis of the mammary bed (53.29 ± 26.18 *versus* 46.19 ± 36.47 min)(p=0.54) with obvious better length in (GroupI). The directly calculated free flow was significantly higher in GroupI (79.15 ± 47.41 *versus* 53.41 ± 39.85 ml/min)(p<0.01). The DF was also highly significant in (GroupI) (68.47 ± 12.16 *versus* 55.7 ± 23.41%)(p<0.01) but No significant statistical difference was observed comparing quantitative pulsatile flow and pulsatile index at the end of the operation in the two groups (34.47 ± 17.51 *versus* 25.61 ± 17.87 ml/min)(p=0.078) and (2.35 ± 0.72 *versus* 3.12 ± 0.69) (p=0.325) The mean amount of total drainage was (694.2±428.51 ml *versus* 984.51±367.49 ml)(p<0.001). No significant difference in the need for blood transfusion and the incidence of re-exploration but the duration of the chest drains (h.) was significantly lower in (GroupI) (29.15 ± 15.3 *versus* 38.18 ± 32.9h.) (P<0.01). Postoperative CK-MB and cTnI, were comparable in both groups for 48h. Duration of ventilation, the mean doses of analgesia needed and the length of ICU stay showed a trend towards being significant (p=0.510.063 and 0.069) but the total hospital Length Of Stay (LOS)(d.) was significantly better in GroupI (p<0.001). Clinical F/U outcomes (3m.) were comparable in both groups.
CONCLUSIONS: Semi-skeletonization technique of the IMA can offer the patient most of the advantages of the skeletonization and being also less demanding for the surgeon intra-operatively. Long term follow up and larger scales of patients are needed.

00198

Surgical degenerative cardiovascular disease and gingivitis. Sex role

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BACKGROUND: The prevalence of periodontitis on adult population is about 90%. When it progresses getting worse it becomes gingivitis. The prevalence of gingivitis is around 45% when periodontitis is present. Surgical degenerative cardiovascular disease is more frequent in men. Gingivitis is frequently associated with this disease and some authors believe that this may be the cause of surgical degenerative cardiovascular disease due to bacterial spread of dental plaque and gingival mucosa. In the adult population of our mediun gingivitis is more frequent in male. However, among patients with surgical degenerative cardiovascular disease prevalence of etiologic risk between the two sexes is different than in the adult population without surgical degenerative cardiovascular disease. Surgical degenerative cardiovascular disease has the same ethiologic factors than periodontitis (smoking, diabetes, blood hypertension, inadequate diet, obesity, sedentary lifestyle, hypercholesterolemia). The objective is to study the prevalence of gingivitis among patients with surgical degenerative cardiovascular disease depending on their sex.
METHODS: From January first to december 31, on 2016, 233 interventions were carried out in surgical degenerative cardiovascular disease (96 coronary by pass surgery, valvular aortic stenosis surgery in 99, and on 38 with both surgery). There are 102 women (Group A) and 131 male (Group B). To study the severity of gingivitis we use the index of Loe and Silness reduced (IG-r), which was used to assess the degree of gingivitis. The informed consent was explained and signed by the patient. The hospital ethics committee was informed. Continuous variables are expressed as mean value ± SD. Comparisons between continuous variables were performed using a two-tailed unpaired Student ttest. Dichotomous variables were compared using contingency table and chi-square analysis. A p value of < 0.05 was taken as statistically significant. The statistical study was done using SPSS 18 system.
RESULTS: There were no significant differences in the presence of comorbidities (renal failure, pulmonary pathology, neurological deficits, peripheral vascular pathology and arterial hypertension) between groups A and B, except in the incidence of diabetes (significantly higher in women).Gingivitis prevalence was similar in both sexes (100 % in both groups), but the severity was different: The IG-r was 2.12 ± 0.8 (inflammation severe) in women and 1.73 ± 0.3 (moderate inflammation) in the male (p<0.05).
CONCLUSIONS: Gingivitis prevalence was similar in both genders (100 % in both groups), but the severity was different: inflammation is more severe in women and moderate in the male, in a paradoxical way, given that in the normal adult population, the male has significantly more prevalence of gingivitis.

00355

Surgical treatment of a persistant left superior vena cava draining into the left atrium with a left-to-right shunt. Case report.

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BACKGROUND: A persistent left superior vena cava (PLSVC) is a rare congenital systemic venous anomaly. Usually draining into the right atrium via the coronary sinus without clinical expression, it can connects to the left atrium directly, via an unroofed coronary sinus or through a left superior pulmonary vein. Responsible for a right-to-left shunt, associated with an increased risk of intracerebral abscess, and embolic cerebrovascular stroke, left- to-right shunt have been reported when increase in left atrial pressure. It is often an incidental finding during cardiovascular imaging or transvenous procedures via left subclavian approach. Intraatrial rerouting techniques have been the most common surgical management to correct PLSVC draining to the left atrium with no connecting vein. Althoug when a bridging left innominate vein exist, a simple ligation can be performed.
CASE REPORT: A 65 year old woman, who had been operated twice for a coarctation of the aorta, was referred for the surgical treatment of a PLSVC discovered during an interventional procedure (atrial fibrillation ablation). Explorations (cardiac CT angiography, transoesophagial echocardiography with injection of agitated saline into the left cubital vein, right heart catheterization) identified a left superior vena cava joining the left innominate vein to the upper lateral part of the left atrium, without intra-cardiac shunt, associated to severe precapillary pulmonary hypertension (PAP (s/d - m) 70/26 - 42 mmHg) with an elevated cardiac blood flow (11,3L/min) and a biatrial enlargement (left atrium 34cm2 - right atrium 36 cm2). Any other congenital heart anomalies were noticed. The operation was performed without extracorporeal circulation by a median sternotomy approach. A PLSVC with arterialised blood was visualized, smaller than the right superior vena cava, connected by a left innominate vein, that was draining into the roof of the left atrium. After clamping the PLSVC, it was ligated at the junction with the left innominate vein and its entry to the left atrium and sectionned. In the postoperative period, she presented a new episode of atrial fibrillation that was controlled by antiarrhythmic drug therapy. No additional adverse event was reported.

00096

Supra-valvular aortic stenosis associated to aortic valve stenosis in very old and high-risk patient needs for surgical strategy even in transcatheter era

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BACKGROUND: Supra-Valvular Aortic Stenosis (SVAS) is a rare disease and frequently associated to aortic valve stenosis in adults. Its first cause is a systemic elastin arteriopathy (ELN), in syndromic or non-syndromic condition. Morphology and localisation complexity, together with the few symptoms, make diagnostic and clinical management difficult. Current guidelines and general tendency in aortic valve stenosis in over 85 year-old patients recommend TAVI procedure because of the less invasive procedure and the risk reduction in very old patients comparing to conventional surgery. But in case of concomitant supra-valvular aortic stenosis, TAVI procedure could be technically unfeasible and surgery remains the only available option.
Here we report a case of an 87-year-old man with a calcified aortic valvular stenosis associated with a supra-valvular stenosis.
CASE REPORT: An 87-year-old male was referred to our centre because of an Aortic Valve Stenosis (AVS). The symptomatology was typical including dyspnoea (NYHA III) associated to an episode of lipothymia. Patient co-morbidities were hypertension, stroke in 2014 and pulmonary emphysema. The case was discussed by heart team and TAVI procedure was proposed because of patient's age, frailty and operative risk (EuroSCORE II: 7,8). At the pre-operative assessment, angio-CT scan showed an isolated SVAS at the level of the sino-tubular junction (less than 2cm aortic diameter). This pathological anatomy contraindicated TAVI procedure, because of the impossibility to expand the aortic part of any transcatheter valvular device. TEP scan excluding tumoral lesions was realized and surgical treatment was reconsidered by the heart team and proposed after patient agreement. Surgery consisted in a biological aortic valve replacement associated to a polyester vascular aortic enlarging patch, in order to re-establish a normal aortic diameter, under cardiopulmonary bypass (144 min). Aortic cross-clamping was 108 min. Peri-operative trans-oesophageal echocardiography showed satisfactory hemodynamic results and a normal ascending aorta diameter (3,4 cm). Post-operative course was uneventful. Furthermore, anatomo-pathological examination of aortic tissue at the site of stenosis was performed. But our results were no specific. In conclusion, congenital or acquired supra-valvular aortic stenosis is a rare disease, often associated to an aortic valve stenosis. This particular pathological condition associated to aortic valve stenosis in very old and high risk patient needs for surgical strategy, even in transcatheter era. CT pre-operative assessment is crucial for decision making.

00010

Follow the heart…and follow the head: the multidisciplinary management of a case of infective endocarditis complicated by hemorrhagic stroke

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BACKGROUND: Infective endocarditis (IE) is an uncommon yet potentially fatal condition with an incidence of 3-7 per 100000 person-years and up to 15-30% in-hospital mortality. IE remains a diagnostic challenge and delays in diagnosis are common. Important complications include valve regurgitation, heart failure and septic embolism. Risk of embolism in IE is high with neurological complications reported in 20-40% of cases. This report describes a case of Staphylococcus aureus mitral valve (MV) endocarditis complicated by haemorrhagic stroke requiring emergency neurosurgical and cardiothoracic surgical intervention.

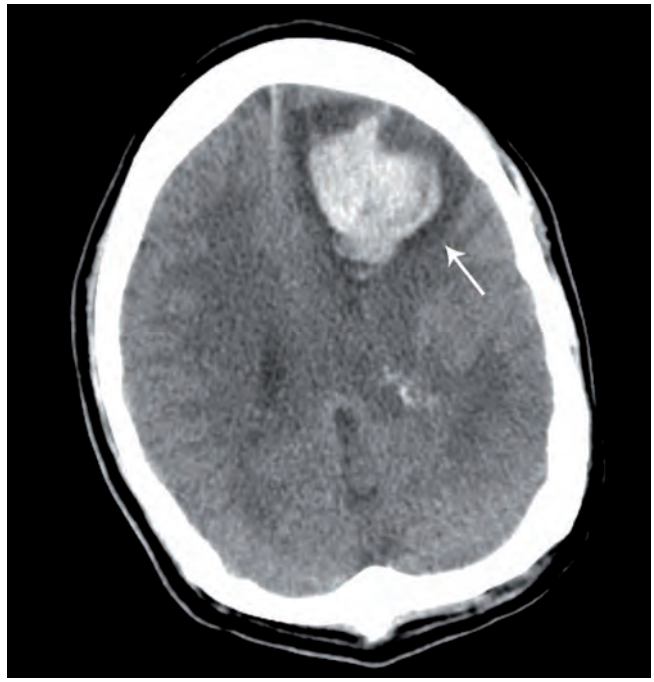

Figure 1.—Computed tomography of the head revealed a large (4 cm maximum oblique transverse diameter) haematoma in the left frontal lobe with mass effect (arrow).

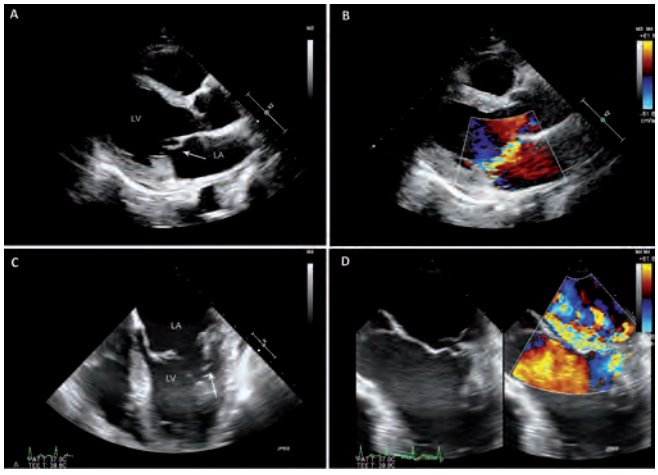

Figure 2.—Transthoracic (panels A, B) and transoesophageal (Panels C, D) echocardiography demonstrating a large vegetation on the mitral valve (arrow) and severe eccentric mitral regurgitation (Panels B, D). LA - left atrium, LV - left ventricle.

CASE REPORT: A 27-year-old man with a past medical history of severe anxiety presented with a 3-day history of fever, polyarthralgia, diarrhoea, vomiting and a rash following an uncomplicated dental procedure a month previously. He felt unwell for one week but denied recent travel or intravenous drug use. Examination revealed fever 38.1C, heart rate 118 bpm, blood pressure 108/77 mmHg, respiratory rate 18/min and oxygen saturation 96% on air. He had a widespread vasculitic rash, multiple tender joints, bilateral clear lung fields and normal heart sounds. Blood tests showed a raised CRP 258mg/l, lactate 2.83 mmol/L and creatinine 156umol/l. Three blood cultures grew Staphylococcus aureus. Viral and immunology screen were negative. He was started on intravenous Vancomycin 1g BD and Clindamycin 600mg QDS according to sensitivities. He developed acute abdominal distension and computed tomography (CT) whole body showed markedly distended colon suggestive of obstruction. The General Surgeons attributed his abdominal distension to pseudo-obstruction secondary to sepsis managed conservatively with a flatus tube. On Day 5 he deteriorated and was transferred to Intensive Therapy Unit (ITU). A new systolic murmur, bi-basal pulmonary crackles and splinter haemorrhages prompted transthoracic echocardiography (TTE) which confirmed vegetations on MV and moderate mitral regurgitation. He was reviewed by Cardiology and diagnosed with Staphylococcus aureus infective endocarditis. On Day 8, he developed acute right-sided hemiparesis, aphasia, confusion and drowsiness. CT Head demonstrated a left frontal intra-cerebral haematoma with mass effect (Figure 1). CT angiogram did not reveal any obvious vascular abnormality. He was urgently transferred to the Neurosurgery centre and underwent an uneventful emergency left frontal craniotomy and evacuation of haematoma. Antibiotics were switched to intravenous Meropenem 2g TDS and Gentamicin 100mg TDS. He deteriorated on Day 34 with hypotension and pulmonary oedema and was transferred to ITU. Repeat TTE and transoesophageal echocardiogram showed large vegetations on MV and severe mitral regurgitation (Figure 2). In view of progressive valve disease, heart failure and uncontrolled infection refractory to medical therapy he was referred for cardiac surgery. On Day 37 he underwent mechanical MV replacement and tricuspid valve repair. He made good post-operative recovery and completed 6 weeks of intravenous antibiotics. He was discharged with follow-up by Stroke, Cardiology, Cardiothoracic surgery, Neurosurgery, Physiotherapy, anti-coagulation clinic and Dentist.
CONCLUSIONS: This complex case of IE demonstrates the collaborative effort of the multidisciplinary team that successfully delivered timely medical and surgical care, culminating in the survival of this high-risk patient. Further research is needed to determine the optimal timing of surgery for IE complicated by stroke.

00231

Pattern of hyperbilirubinemia and its outcomes on cardiopulmonary bypass: our experience

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BACKGROUND: Inspite of advances in anaesthesia, surgical and perfusion techniques, postoperative liver dysfunction is still common and compromises standard care of cardiac surgery patients. Early transient hyperbilirubinemia after heart surgery is very common. In the various studies, incidence is reported to be 10%– 40% and is often associated with postoperative morbidity and mortality, while some studies showed that CPB time less than two hours is not associated with compromised liver function test. An elevation of serum liver enzymes after uncomplicated CPB has been reported in some studies. In our study aimed to identify pattern and safe levels of the serum bilirubin, enzymes and their impact on clinical outcome of postoperative liverdysfunction after CPB.
OBJECTIVE: 1. To identify the pattern of serum bilirubin, enzymes levels and early clinical outcomes after cardiopulmonary bypass.
2. To identify the safe levels of serum bilirubin and enzymes in postoperative liver dysfunction.
METHODS: In our study, we assessed the parameters of postoperative liver dysfunction (serum bilirubin, enzymes levels) and their impact on early clinical outcome after open heart surgery (both conventional and minimally invasive cardiac surgery) of 97 patients from May 2016 to January 2017. Postoperative hyperbilirubinemia was defined as serum total bilirubin >2.0 mg /dl.
RESULTS: The patients were divided into two groups: Group A; CPB time £ 120 minutes (37.11%), Group B; CPB time >120 minutes (62.88%). Mean total CPB and cross clamp time in group A (96.30 & 65.30 minutes respectively) and in group B (176.06 & 139.49 minutes respectively). High inotropic support, ventilation time, ICU stay, blood transfusions and complications were more in group B. The serum total bilirubin reached its maximum level on the first, second and third postoperative day in 17%, 43%, and 34% in group A and 7%, 64%, 44% in group B patients and hyperbilirubinemia came mainly from indirect bilirubin. The pattern of raised liver enzymes mainly AST on the first, second and third postoperative day in 86%, 86%, and 40% in group A and 87%, 98 %, 64 % in group B patients. Hospital mortality was higher in group B (16.33%) than in group A (5.55%).
CONCLUSIONS: Postoperative hyperbilirubinemia and significantly raised enzyme mainly aspartate aminotransferase is common in patients undergoing cardiopulmonary bypass on second postoperative day and is predictor of mortality. The increased preoperative bilirubin level, valvular heart disease, cardiopulmonary bypass time, aortic cross clamp time and blood transfusion units were common factors for persistent hyperbilirubinemia which is associated with a grave clinical outcome than early transient hyperbilirubinemia. All measures should be taken to prevent prolong CPB to avoid persistent postoperative hyperbilirubinemia resulting inimpending liver failure, sepsis, or multi organ failure.

00256

Excellent short- and mid-term outcomes of infants undergoing end to side anastomosis for coarctation of aorta

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BACKGROUND: To study the short and mid term outcomes, incidence of recoarctation in infants who underwent End to Side anastomosis for coarctation of aorta.
METHODS: From 2013 to 2017, 92 patients underwent end to side anastomosis for coarctation of aorta. Infants with the diagnosis of isolated coarctation, coarctation associated with Patent Ductus Arteriosus(PDA) and Bicuspid aortic valve were included. We did a retrospective study on these infants by analysing early and mid term outcomes .56 of these patients had PDA, 20 patients had Bicuspid aortic valve. Pre operative analysis of the patients was done by assesing the clinical condition, need for inotropic and ventilatory suppot, two dimensional Echo-

cardiography to assess left ventricular function and size of PDA.
RESULTS: Mean age of patients at the time of repair was 88.01 days. Mean weight of patients was 4.14kg. Minimal follow up period was 2 years and maximum follow up was 6.1years. All the repairs were approached through left posterolateral thoracotomy from the third intercostal space by the same surgeon. Mean cross clamp time was 24.67 minutes. All the patients had a gradient less than 12mm Hg at the end of surgery. There were two in hospital deaths. Both the patients died due to sepsis. No complications like recurrent laryngeal nerve palsy, bronchial compression and chylothorax were observed. Follow up data was available for 85 patients. One patient died 3 months later due to unknown cause. 4 patients were lost to follow up. During follow up two dimensional Echocardiographic gradient of 20 mm Hg was considered as recoarctation. 85 patients followed up cases were free of recurrence.
CONCLUSIONS: Repair of isolated coarctation, coarctation assoaciated with Patent ductus arteriosus with end to side anastomosis has a low early and late mortality, freedom from reintervention, excellent mid term outcomes. Hence it should be the preferred approach.However long term follow up is required to assess the rates of reintervention and late outcomes.

00192

Endocarditis surgical treatment in a tertiary referral hospital: short- and long-term outcomes

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BACKGROUND: To evaluate incidence, short and long-term survival in patients undergoing cardiac surgery for endocarditis in a tertiary referral hospital.
METHODS: We analysed data prospectively recorded in the institutional database from 2012 to date. Serial clinical follow-up and phone interview were conducted.
RESULTS: Sixty-nine patients underwent cardiac surgery for valve endocarditis. Pathogens distribution was reported in Figure 1. Endocarditis process mainly involved native valve, generating mitral regurgitation (53%), aortic regurgitation (37%) and tricuspid regurgitation (15%) and it was often associated with vegetation (47%), abscess (20%) or cusp perforation or prolapse (17%). Incidence of prosthetic valves endocarditis was 17% (re-do surgery). Pre-operative neurological event's incidence was 21%. Overall mean logistic EuroSCORE estimated mortality was 7.4%. In Prosthetic Valve Endocarditis (PVE) EuroSCORE estimated mortality was 17.7% and in Native Valve Endocarditis (NVE) it was 5.7%. Single aortic valve procedure was performed in 32% of patients and single mitral valve procedure in 22% of patients, 17% of whom underwent mitral valve repair. Tricuspid valve repair was performed in 3% of patients. Combined valves procedures involved 20% of patients. Aortic root or ascending aorta was treated in 12% of the cases. Overall mean CPB time was 105 minutes and mean cross-clamp time was 89 minutes. CPB time (155 vs 76 min; p:0.01) and cross-clamp time (118 vs 67.5 min; p:0.006) were significantly higher in PVE than in NVE. Intraoperative mortality was 0%. Intensive care unit length of stay was longer in PVE patients (7 vs 4 days) with a longer mechanical ventilation time (124 vs 12 hours). Mean hospital length of stay was 21 days and it was significantly longer in PVE patients (28 vs 17 days; p:0.04). Overall 30-days mortality was 15% and it was higher in PVE patients (22%) due to septic complications. Overall early morbidity was 39%; most common complications were atrial fibrillation (16%), Acute Kidney Injury (16%), sepsis (16%) and major bleeding (10%). Overall long-term mortality (mean follow-up: 36 months) was 5.8%. In PVE patients, long-term mortality was 33%.
CONCLUSIONS: Cardiac surgery for endocarditis process requires often demanding operation, especially in prosthetic valves involvement, and it was characterized by higher 30-days mortality. Our mortality and morbidity data are placed in the average of the best international reported data. These patients should undergone serial clinical and instrumental follow-up to evaluate clinical status and strict prophylaxis to reduce incidence of prosthetic valves endocarditis, characterized by higher short and long-term mortality.

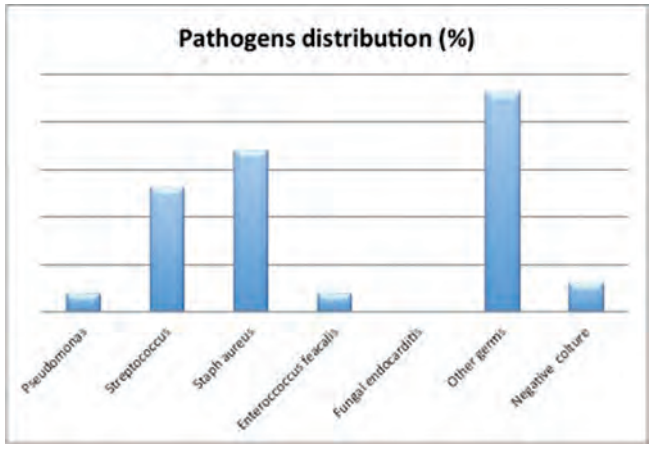

Figure 1.

00299

Patient prosthesis mismatch following mitral valve replacement: how really significant is the size of prosthesis?

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BACKGROUND: Patients-prosthesis mismatch (PPM) following aortic valve surgery replacement has been extensively evaluated in terms of diagnostic options, real incidence, clinical impact and also surgical options for prevention. As far as the PPM following mitral valve replacement, conversely, there is still an ongoing debate. The base of debate is on the diagnosis itself of such entity, as different studies, using different methods of evaluation, presented completely different results. Further relevant issue is that surgical options to prevent a potential mitral PPM (i.e. implantation of a bigger-sized prosthesis) could be at high risk of postoperative major complications. In this study we sought to elucidate the real incidence of hemodinamically significant mitral PPM following mitral valve replacement and the real relevance of prosthesis size in causing PPM in our single centre experience.
METHODS: Out of 2525 patients undergoing major cardiac surgery procedure at our Division over the last 4-years period, 280 (11.1%) underwent mitral valve surgery as part of the procedure. 126 patients (45%) received (as isolated or combined procedure) a mitral valve replacement (MVR), either with a biological or a mechanical prosthesis, and represent the cohort of the present study. As the accepted definition of patients-prosthesis mismatch include the presence of abnormal transprosthesis gradient, we considered and defined, in this study, as "hemodinamically significant" mitral PPM an increased mean postoperative trans-prosthesis gradient (based on published reference values for each prosthesis) at trans thoracic echocardiography, evaluated by a single experienced investigator. Incidence of mitral PPM, according our definition, was evaluated for the cumulative populations and according the type of prosthesis used. For mechanical prosthesis the hemodynamic performances using Ony-X single size were specifically compared to the performances of standard Sorin (according different size). Clinical impact of mitral PPM in terms of significant different postoperative outcome was also evaluated.
RESULTS: 126 patients underwent MVR, as isolated procedure (48%) or part of a combined procedure (52%). 54 pts (43%) received a mechanical prosthesis (Ony-X or Sorin), 72 (67%) biological prosthesis. Mean age and numbers of combined procedures were significantly higher for patients receiving biological prosthesis (p=0,028 and p=0,032 respectively) while logistic Euroscore was similar in two groups. Overall increased maximum and mean transprosthesis gradient were measured in 1 (0,79 %) and 10 (7,9%) patients respectively. No significant differences were showed in increased mean transpros-

thesis gradient between patients receiving biological (6 pts, 8,3%) or mechanical prosthesis (4 pts, 7,4%). No significant differences were also shown in patients receiving mechanical Ony-X single size prosthesis compared to the cumulative populations receiving a calibrated-size Sorin prosthesis. Furthermore no significant correlation was shown between Sorin prosthesis size and transprosthesis gradients. Similarly no significant correlation was shown between size and gradients in biological prosthesis populations. Finally no clinical impact in terms of unfavourable postoperative outcomes was showed in patients with increased transprosthesis gradient.
CONCLUSIONS: Our single centre experience, based on *in vivo* post-operative measurement of hemodynamic performances of different mitral valve prosthesis used for mitral valve replacement in a population of patients with high percentage of complex procedures, clearly show that the real clinical relevance of mitral PPM is probably over-estimated. Furthermore the specific comparison between two types of mechanical prosthesis with completely different concept shows as the internal size of prosthesis is not the only factor influencing postoperative hemodynamic and therefore the risk of mitral PPM. These data, in our mind, clearly show that the risk of increased surgical risk to insert a bigger prosthesis, to avoid a potential mitral PPM, has to be accurately evaluated and is probably not supported by the limited clinical relevance of real mitral PPM.

00030

Midterm outcomes of infective endocarditis

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BACKGROUND: Infective endocarditis carries considerable mortalities and morbidities even with appropriated therapy. The aim of this study was to evaluate early and interim results following surgical treatment for native valve endocarditis (NVE) and to investigate risk factors associated with survival.
METHODS: Twenty nine patients with the mean ages of 57.1 underwent surgery for NVE between March 2003 and February 2017. Male patients were 23 (79%). Data pertaining to patients characteristics, operative and postoperative variables, and early and interim survival indices for surgical treatment of NVE were retrospectively obtained from our institutional database. Data comparisons and survival calculations were performed using the Chi-squared test, logistic regression analysis, and the Kaplan-Meier method with IBM SPSS Statistics.
RESULTS: Follow-up was complete and the mean follow-up duration was 61.2 months. As for the source of infection, 11 patients (46%) had the poor oral hygiene with dental problems. The affected valves were mitral in 20 and aortic in 9 patients. Causative organisms were Streptococci in 14, Staphylococci in 7, miscellaneous in 2, and unidentified in 6 patients. Preoperatively, 9 patients suffered from cerebral embolism with or without symptoms. Five patients (17%) needed the emergent or urgent operations due to unstable conditions or threatened embolism. The surgical treatments were replacement in 27 and repair in 2 patients. The types of replaced valves were mechanical in 16 and tissue in 11 patients. The combined surgeries were CABG in 2 cases. Double valve replacement were performed in 2 cases. Early mortality was noted to be 13.7% (4/29). Major postoperative complications occurred in 6 patients (20.7%) were cerebral infarction, bleeding requiring reoperation, persistent bacteremia, pneumonia in each, and low cardiac output in 2 patients. The causes of death were sepsis in 2 and sudden cardiac death in 2 patients. One patients required reoperation according to paravalvular leakage. Two late deaths occurred due to cancer and traffic accident. Six-month and three-year survival rates were 82.8% and 76.2%, respectively. Causative organisms, affected valves, and embolic events did not show statistically significant differences in the surgical outcomes. End-stage renal disease (ESRD) and insufficient use of antibiotics were found to be independent risk factors affecting early mortality ($p = 0.042$ and $p = 0.01$, respectively) and overall survival ($p = 0.005$ and $p = 0.046$, respectively).
CONCLUSIONS: Surgical treatment for NVE is associated with considerable mortality and morbidity. ESRD and insufficient use of antibiotics show a significant correlation with unfavorable outcomes.

00204

Mitral valve repair, single surgeon's experience at teaching hospital Kandy, Sri Lanka

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BACKGROUND: Our primary aim was to analyze the pre and post-operative overall outcome of Mitral Valve Repair (MVR) using transthoracic echocardiography. Secondly, we wanted to maintain a local MVR data registry to guide local medical personal to obtain better clinical outcome in MVR with minimal resources in a developing country.
METHODS: It was a uni-centre single surgeon experience of MVR for a duration of seventy five months from October 2011 to December 2017. Pre-operative and post-operative clinical notes were used for data collection and entered to an excel sheet. The collected data were analyzed using SPSS statistical software.
RESULTS: A total of 118 patients underwent MVR, age ranging from 4 - 73 years (mean of 44 years). There were 59 males and 59 females. Number of failed cases were eight (2 deaths, 6 ended up in mitral valve replacement). Pre-operative 2D-echo findings according to the grade of mitral regurgitation were graded, grade I - 2 cases, grade II - 8 cases, grade III - 45 cases, grade IV - 63 cases. Post-operative 2D-echo findings of mitral regurgitation were graded, grade 0 - 42 cases, grade I - 61 cases, grade II - 12 cases, grade III - 3 cases. Number of MVR associated with other surgical procedures were 32, out of them, CABG - 19 cases, Aortic valve replacement - 6 cases, Osteum primum ASD - 5 cases, Osteum secondum ASD - 1 case, Vegetectomy due to acute endocarditis - 7 cases. Pre-operative assessment of AMVL and PMVL prolapse and chordal rupture by Trans-thoracic echocardiography were compared with intra-operative findings. Results were (2D-echo: Observed) AMVL prolapse 25 : 16, PMVL prolapse 23 : 23, AMVL chordal rupture 6 : 16 and PMVL chordal rupture 16 : 28 respectively.
CONCLUSIONS: These results showed promising immediate outcome with a success rate >90%. Proper pre-operative sonographic assessment of the valve will help to obtain favourable outcome towards MVR. Techniques should be tailor made according to the pre-operative sonographic findings and intra-operative assessment of the morphology of the mitral valve in individual patients. Also selection of appropriate annuloplasty ring, proper sizing and accurate placement of artificial chords and avoid systolic anterior motion of the leaflet could help to achieve better outcome. Avoidance of Warfarin usage, lower rate of thromboembolic phenomenon and less incidence of Infective endocarditis are other advantages of MVR over mitral valve replacement. During our clinical follow-up, we have observed that the improvement of left ventricular function was superior in MVR over replacement.

00379

Incidence of permanent pacemaker implantation after conventional aortic valve replacement and TAVI: a single center experience

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BACKGROUND: Conduction abnormalities after cardiac surgery are observed in 17% to 34% of patients. Transient bradyarrhythmias resolve themselves in the first days after surgery, but persistent conduction disturbances requiring pacemaker implantation (PPI) occur in 0.4-8.5% of patients undergoing conventional heart surgery, depending on surgery type and can reach even higher frequencies after TAVI. Aim of our study was to determine the incidence of PPI after conventional cardiac surgery and to compare the incidence of PPI after aortic valve replacement and TAVI as well as to assess its influence on intrahospital outcomes.
METHODS: This is a single-centre retrospective study, we reviewed all patients who underwent open heart surgery between years 2015 and 2017 - in total 3242 patients. Included were all patients with PPI postoperatively before discharge. As well all patients undergoing transfemoral TAVI using either the Edwards Sapien or Medtronic Corevalve

systems were assessed - a total of 174 and 50 patients respectively. We compared the patient demographics, and perioperative state, incidence of PPI and inrahospital stay among groups. Chi-Square or Fisher's Exact Test, normal approximation (Wald) was used, p values <0.05 were considered as statistically significant.
RESULTS: One hundred thirty-five (4.2%) patients received a PPI after cardiac surgery, of these patients 24 following AVR. Mean age of PPI patients ± standard deviation was 68.5 ± 10.5 years. Mean days of PPI after AVR surgery was 6.0 ± 4.0. The incidence of PPI in group of conventional AVR patients was 3.3%. PPI incidence among conventional surgical patients was only higher in the tricuspid valve intervention group - 8.8%. Complete AV block as an indication for PPI in the AVR group was in 16 (66.7%). Length of total hospital stay for AVR increased significantly if receiving a PPI from 9.2 days to 16.2 days. There were no intrahospital deaths in the AVR PPI group. After TAVI 11 patients received PPI, 7 of them after Edwards Sapien implantation giving a PPI incidence of 4.0% and 4 after Medtronic Corevalve, with an incidence of 8%. In both of these groups patients mean age was significantly older than that in the Conventional AVR, 82.6±5.8 in Corevalve and 83.2±4.3 in Sapien group. Length of hospital stay in these groups increased from 10.4 days to 16.4 in the Sapien group and from 8.2 days to 14.1 in Corevalve group.
CONCLUSIONS: In our centre, patients undergoing heart surgery require a PPI in approximately 4.2% of all cases. The risk of PPI was particularly higher after procedures where TV was involved next followed by AVR. Incidence of PPI after TAVI with the Sapien valve was not significantly higher when compared to conventional AVR, but it was significantly increased after TAVI with CoreValve. Regardless of the initial procedure a need for PPI significantly increased the total length of hospital stay and hence increased overall procedural costs.

00377

Epicardial bipolar radiofrequency ablation of pulmonary vein as a preventive strategy for reducing the incidence of postoperative atrial fibrillation in coronary artery disease patients

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BACKGROUND: We sought to evaluate the effectiveness of epicardial bipolar radiofrequency ablation of pulmonary vein in preventing postoperative atrial fibrillation (POAF) in coronary artery disease (CAD) patients undergoing coronary artery bypass graft (CABG) surgery.
METHODS: A single center prospective randomized clinical study, involving 63 CAD patients, was conducted. The study was approved by the local research ethics committee. Written informed consent was obtained from all participants. The patients were eligible for CABG and none of them had a history of atrial fibrillation. The patients were divided into two groups: Group 1 (n=34) received isolated standard CABG; Group 2 (n=29) had CABG with concomitant epicardial bilateral radiofrequency pulmonary vein ablation for the primary prevention of POAF. A routine cardiovascular assessment including echocardiography and coronary angiography was carried out in all the subjects. All the interventions were performed by a single surgical team using standardized anesthesia and perfusion protocols, with a perfusion index of 2,4-2,7 L/m2 at a perfusion rate of 3,84±0,8. All operations were performed through a full median sternotomy. Cardiopulmonary bypass (CPB) was connected by cannulation of the ascending aorta and right atrium with a double-lumen cannula. Bipolar radiofrequency ablation was completed in the setting of parallel CPB with the use of the Isolator Transpolar bipolar electrode clamp at the Atricure Inc. surgical ablation system (USA) until transmurality was achieved. At the stage of CABG a standard procedure was performed using the left internal thoracic artery and the vena saphena magna after thermal blood cardioplegia. There was no occlusion of the left atrial appendage. Statistical processing was carried out using STATISTICS 10. All results are expressed as mean ± standard deviation, among others, Student's t-test for normal distribution and $\chi 2$ for discrete values were used. Differences were considered significant at p <0.05.
RESULTS: There was no in-hospital mortality in either group. Performing radiofrequency ablation was not conducive to longer operating times at any of the main stages of the procedure either in Group 1 or in Group 2.The groups were comparable for the duration of the intervention parameters (266,65 ± 44,9 251,96 ± and 41 min, respectively, p = 0,184) cardiopulmonary bypass time (88,64 ± 19,2 ± 86.55 and 16.9 min, respectively, at p = 0.381), the aorta clamping time (53.38 ± 12.5 and 48.38 ± 8.7 min, with p = 0.386). The groups did not differ in the number of shunts (3.23 ± 0.61 and 3.13 ± 0.51 at p = 0.524). POAF was observed in 11 (32.4%) patients in the CABG group and 7 (24.1%) patients in the pulmonary vein ablation group. There was no significant difference (p = 0.470). AF in 91% occurred on the 2-3rd day of the postoperative period, not differing between the groups of observations. Patients had no significant differences during the postoperative period. Complications from the operating wound, repeated surgical interventions, perioperative myocardial infarctions and cerebral circulation disorders were also not noted. In each group, there was one case of POAF persisting at the time of discharge from the hospital.
CONCLUSIONS: Adding adjuvant ablation of the pulmonary vein to CABG only slightly complicates the surgical intervention, but does not extend the time of CPB and the operation. There has been a trend found towards a decrease in the incidence of POAF in patients undergoing preventive bipolar RFA of the pulmonary vein, however, further larger studies are required to obtain statistically reliable evidence.

00133

Factors affecting the development of tricuspid valve insufficiency after complete congenital heart defects repair

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BACKGROUND: To evaluate factors affecting the development of tricuspid valve (TV) insufficiency in late follow-up, after complete repair of congenital heart defects (CHD).
METHODS: From the period from 2000 to 2015, 86 patients where operated for TV insufficiency developed after previous CHD repair. Mean age was 24.9±14.2 (3-65) years. 39 were females and 47 were males. Previous surgery was atrial septal defect closure - 11.6%, ventricular septal defect closure - 20.9%, tetralogy of Fallot - 23.3%, double outlet right ventricle - 10.4%. New York Heart Assosiation (NYHA) functional class was III-IV. According to surgery performed, all patients were divided into 2 groups: 1st - TV reconstruction (30 patients), 2nd - TV replacement (56 patients). Indications for TV reconstruction were anterior and septal leaflet deformation of different degree and severe annular dilatation and high right ventricular pressure (over 100 mm Hg) in patients with residual pulmonary stenosis. TV replacement had being performed in patients with multiple leaflet perforations and vegetations due to infective endocarditis, intracardiac pacing wires, or severe fibrotic dysplasia associated with leaflet lesion during previous surgery.
RESULTS: In-hospital mortality was 1 patient (3.3%) in 1st group, and 4 patients (7.14%) in the 2nd. Factors associated with mortality were initial IV NYHA functional class, left ventricle ejection fraction less than 40%, longer bypass time and multiple concomitant heart defects corrected simultaneously. Non-lethal complications (total 23 patients – 26.6%) were low cardiac output syndrome in 9 patients, stroke – 2 patients, pneumothorax – 2 patients, bleeding – 1 patient. 9 patients required pacemaker implantation. At discharge all patients moved to I-II NYHA functional class. Mean follow-up time was 8.18±4.5 years (1-16), 2 patients from the 1st group required re-valvuloplasty, and 20 patients from 2nd group required valve re-replasement. Long- term survival (by groups) in 5, 10 and 15 years was 96.3%, 90% 81% in the and 94.5%, 86% and 64% respectively. Re-valvuloplasty was performed in 2 patients from the 1st group, and 20 patients from 2nd group required valve re-replacement.
CONCLUSIONS: The leading factor for tricuspid insufficiency after complete repair of congenital heart defects were underestimation of TV

function and surgical faults at the time of previous procedure, TV annular dilatation, intracardiac pacing wires, infective endocarditis and leaflet degeneration. Reconstructive surgery should be preferred, especially in children and young adults, who are more prone to calcification and early patient/prosthesis mismatch development.

00187

Using two internal thoracic artery in off-pump coronary bypass surgery

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BACKGROUND: Coronary artery bypass grafting (CABG) is the preferred method of myocardial revascularization in patients with multifocal coronary artery disease. Most surgeons still don't want to use two internal thoracic artery in off-pump surgery because they believe this process is technically more difficult, time-consuming and associated with a higher risk of infectious complications. The aim of this study was evaluate efficiency and safety isolated off pump CABG using 2 internal thoracic arteries in the early postoperative period.
METHODS: In the period from 09.2012 to 11.2017 in our clinic performed 598 operations isolated Off-pump coronary artery bypass grafting using two internal thoracic arteries. In our work there are no contraindications for age, sex, size of the heart, quality of distal bloodstream and left main coronary artery stenosis. We made an analysis of the results of these operations on several criteria: patient's age, the number of conduits, the volume of blood loss (ml), hospital mortality, perioperative myocardial infarction, the incidence of non-infarction heart failure, resternotomy about bleeding, the frequency of infectious complications from the sternum (minor infection, mediastinitis), the incidence of neurological complications (stroke).
RESULTS: In our group men were 64% and 36% women. The average age of patients was 65.5 years. 27% of patients had diabetes mellitus, and almost a third had obesity. 21% was with left main coronary artery stenosis. The average operation time: isolated off-pump CABG - 146 minutes. The average number of grafts -2.9. In 106 cases, revascularization was performed only with two mammary arteries, with an average number of anastomoses 2.4 due to the use of sequential techniques. In all patients was observed low incidence of myocardial infarction in the early postoperative period (4 patients (0,7%)). We did not notice an increased risk using two internal thoracic arteries in patients with left main coronary artery stenosis. The average volume of intraoperative blood loss was 470 ml. Infectious complications of the sternum was observed in 8 (1.3%) patients. Each infectious complication was in patients with diabetes mellitus. And more often observed in the female. It was performed 14 (2.3%) resternotomy about bleeding. Stroke in the early postoperative period was 0%. There were no lethal outcomes.
CONCLUSIONS: Isolated CABG using bilateral internal thoracic artery immediately after surgery accompanied by low incidence of heart failure, perioperative myocardial infarction, resternotomy about bleeding, infectious complications of the sternum (minor infection, mediastinitis), intraoperative blood loss, need for transfusion of blood components, neurological complications.

00108

Results of intraoperative flowmetry of mammarocoronary shunts in patients with ischemic cardiomyopathy

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BACKGROUND: The objective of the study was to perform intraoperative assessment of the flow through mammarocoronary shunt (MCS) to the anterior descending artery (ADA) in patients with ischemic cardiomyopathy (ICM) depending on the degree of coronary artery (CA) stenosis and the type of left ventricle remodeling by M. Di Donato.
METHODS: The study included 84 patients with ICM, who underwent surgery between November 2014 and November 2017. The age of the patients was 61.3 ± 6.3 years; 80 of them were male. The inclusion criteria were as follows: left ventricle ejection fraction (LVEF) ≤ 40%, end systolic index (ESI) ≥ 60 ml/m2 by echocardiography (ECG), acute myocardial infarction (AMI) in anamneses, and MCS on ADA. All the patients underwent CABG with surgical ventricular restoration (SVR) and mitral repair (MR), if indicated. MCS transit-time was measured intraoperatively by VeriQ system (Medistim, USA), and the flow volume (Q), the pulsatility index (PI), and the diastolic filling (DF) were assessed. The myocardial perfusion in the ADA basin was assessed before and after surgery using single-photon emission computed tomography (SPECT) with 90mTc-MIBI under pharmacological load and at rest and the evaluation of the defect depth and area as well as the overall perfusion deficit by the radial slice of SPECT polar map. The patients were subdivided into 4 groups. Group 1: with ADA stenosis (24 pts); group 2: with ADA occlusion (17 pts); group 3: with SVR and ADA stenosis (19 pts); group 4: with SVR and ADA occlusion (19 pts).
RESULTS: In group 1 with ADA stenosis, Q from the MCS was 52.3 ± 37.5 (7.7) ml/min, PI was 5.3 ± 12.2 (2.5), and DF was 37.8 ± 26.8 (6.5). In group 2 with ADA occlusion, Q from the MCS was 36.2 ± 28.5 (6.5) ml/min, PI was 3.1 ± 1.5 (0.4), and DF was 64.8 ± 11.9 (2.9). In group 3 with SVR and ADA stenosis, Q from the MCS was 26.1 ± 18.4 (4.2) ml/min, PI was 4.8 ± 2.3 (0.5), and DF was 57.2 ± 18.4 (4.2). In group 4 with SVR and ADA occlusion, Q from the MCS was 33 ± 30.1 (7.1) ml/min, PI was 7.2 ± 6.8 (1.6), and DF was 56.9±23.1 (5.3). Reliable difference was noted in Q p=0.05 between group 1 and groups 2, 3, 4, in PI between groups 1, 2, 3 and group 4, and in DF between group 1 and groups 2, 3, 4. According to preoperative myocardium SPECT, the groups were completely different in terms of the presence or absence of left ventricular aneurysm (LVA); groups 3 and 4, in contrast to 1 and 2, had large values of total perfusion deficit and especially the defect stability both under load and at rest. According to the correlation analysis performed in the postoperative period, the degree of the myocardium perfusion change in the groups with SVR before and after surgery manifested in the defect depth and area correlates with Q from the MCS.
CONCLUSIONS: The presence of ADA occlusion and SVR are the factors reducing the flow volume through MCS and increasing the index of shunt resistance that may become the cause of shunt dysfunction in the postoperative period. The correlation of the flowmetry values with the myocardial perfusion is shown in favor of the myocardium revascularization improvement in the postoperative period.

00317

Is left ventricular assist device an alternative therapeutic option to heart transplantation for advanced heart failure patients? Results and outcomes: Saudi experience

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BACKGROUND: With the aging of the population and advances in the treatment of cardiac disease, the number of patients with heart failure continues to increase; in Saudi Arabia, more than 53,000 patients annually develop advanced heart failure (AHF) with limited treatment options and possible potential of death while waiting Heart Transplant. We introduced the Left Ventricular Assist Device (LVAD) as a treatment option in the management of advanced heart failure (AHF) patients at our center. Continuous-flow left ventricle assist devices (LVADs) are used to manage patients with end-stage heart failure. Protection of right ventricular (RV) function is important during LVAD implantation, but sometimes patients require temporary RV support. We present our initial experience in LVAD as an effective treatment for these very sick patients.
METHODS: We studied the effect of LVAD on left ventricle function and quality of life, between May 2017 and January 2018, eight patients all males; mean age: 40 ± 11 years) who suffered from AHF underwent LVAD implantation (HeartMate III). Their INTERMACS profile was 4 (n=4); 3 (n=2) and 2 (n=2) with mean ejection fraction (EF): 16.25 ± 3.5 %.
RESULTS: All implantation were done on cardiopulmonary bypass (CPB) on beating heart with mean cardiopulmonary bypass time =

53 ± 4.2 minutes. Seven patients were discharged home after Left Ventricular Assist Device implantation with mean intensive care unit stay 12 ± 9 days and mean hospital stay 21± 6 days. One patient died on 29th day post-op due to intracranial haemorrhage. During our weekly follow-up, all patients are stable with mean blood pressure 95±10 mmHg, and no one developed neither driveline exit site infection nor thromboembolic events. They resumed their social and professional activities. All patients still on LVAD support and they all improve their left ventricular function with a mean of 35.7± 8.5%.
CONCLUSIONS: LVAD have proven performance and efficacy for the management of end-stage heart failure. However, LVAD implantation remains difficult in terms of right ventricular function, especially when weaning from CPB. LVAD has added a new horizon at our center for the patients who suffered from advanced heart failure (AHF). It improves the quality of life and restores organ functions for AHF patients.

00069

Minimally invasive cardiac surgery *versus* conventional median sternotomy for atrial septal defect closure: comparison of operative datas

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BACKGROUND: Atrial septal defects (ASD) especially secundum ASD is one of the most common form of congenital heart disease. Median sternotomy is the standard approach for atrial septal defect (ASD) closure. We compared clinical outcomes of adult patients undergoing ASD repair via minimally invasive approach *versus* "gold Standard" sternotmy.
METHODS: A total of 44 patients over 14 years old underwent ASD closure at our clinic by a single surgical team from 2012 to 2017. . Fourty four patients with isolated ASD closure were retrospectively analyzed. We compared operative datas of patients undergoing ASD repair via minimally invasive approach *versus* "gold Standard" sternotomy. In the MS group (group 1) , standard median sternotomy was performed, and the usual aortic and bicaval cannulation were used. A vent cannula was inserted via right superior pulmonary vein. Cardioplegia was infused in antegrad fashion via aortic root cannula, and the ascending aorta was cross-clamped. The right atrium was opened, and the ASD was closed primarily or with patch if it was necessary. Patients in the MICS-RAT group (group 2) were positioned with their right side up by inserting towels under the right back. A small incision (approximately 2 cm) was made in the inguinal region for femoral artery and vein exploration. Two nylon tape were turned around femoral artery and vein seperately. A pure string suture with 5/0 prolene was applied at the common femoral vein, and a venous cannula was inserted and tip positioned at the inferior vena cava (IVC) level under transesophagial echocardiography or angiography guidance. Another venous cannula was inserted via the right internal jugular vein and positioned at the superior vena cava (SVC) level. Two venous cannulae were connected with a Y-connector. A purse string suture with 5/0 prolene was applied at common femoral artery and an arterial cannula was inserted via seldinger technique.
RESULTS: When the operative data were analyzed, it was found that there was no difference between groups in terms of cardiopulmonary bypass and cross clamp times, while the operation time was shorter in the minimally invasive group (p = 0.001)
CONCLUSIONS: Although there is no difference between cardiopulmonary bypass and cross clamp times, the short duration of the operation is considered normal because of fewer incisions. Minimally Invasive Cardiac Surgery (MICS) via RAT is an alternative choice for ASD closure.

00084

Comparison of pre-operative variables of patients under going redo cardiac surgery with or without femoral cannulation before sternotomy

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BACKGROUND: Cardiac injury during sternotomy is a common phenomenon in terms of redo cardiac surgery. One of the strategies developed to minimize this injury is cardio pulmonary bypass via femoral cannula placed before sternotomy. In this study, we compared preoperative variables of patients under going redo cardiac surgery with or without femoral cannulation before sternotomy.
METHODS: 114 patients who underwent redo cardiac surgery were divided into two groups, patients with femoral cannulation and patients with Standard sternotomy, respectively. Ethics Committee approval was obtained for the study.The cases consist of patients who under went more than one open heart surgery. The patients were divided into two groups as Group 1 consisted of the patients used CBP before sternotomy and Group 2 included patients not used CBP before sternotomy. Data were retrospectively evaluated. Patients with multiple cardiac surgeries and standard aorta-unicaval, aorta-bicaval and femoral artery cannulation performed were included in the study and patients with axillary or subclavian artery and jugular vein cannulation performed and patients under going off-pump surgery were excluded. Patients' anamnesis, medical histories, peroperative anesthesia follow-up data, cardiopulmonary bypass machine data, postoperative intensive care unit follow-up data were interpreted. Statistical methods: Mean, Standard deviation, median, lowest, highest, frequency and ratio values were used in the descriptive statistics of the data. The distribution of the variables was measured by the KOLMOGOROV SIMIRNOV test. Independent sample t-test, MANN-WHITNEY U test were used in the analysis of quantitative independent data. Chi-square test for analysis of qualitative independent data, and FISCHER test when chi-square test conditions were not met. The statistical analysis was performed utilizing SPSS 22.0 software.
RESULTS: When the patients were examined; no significant differences were found between the groups in terms of their preoperative characteristics, age, euroscore, ejection fraction, pulmonary artery pressure, smoking, hypertension, diabetes mellitus, chronic obstructive pulmonary disease and chronic renal failure rates ($p > 0,05$). Male gender and peripheral arterial disease were significantly higher in Group 1 ($p < 0.05$).
CONCLUSIONS: There is no statistically significant difference between patients with femoral cannulation and patients with Standard sternotomy, except gender and existence of peripheral artery disease.

00206

Narrow ostium of aorta: is posterior aortoplasty necessary during aortic valve replacement?

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BACKGROUND: Purpose of this investigation is to research possibilities of original method of posterior aortoplasty (PA) during aortic valve replacement (AVR) in patents (pts) with narrow ostium of aorta (NOA). To determine significance of patient-prosthesis mismatch (PPM).
METHODS: In analyzed group were included 825 pts with isolated aortic stenoses with NOA wich were consecutive operated in Institute from 01.01. 2010 till 01.01.2017. There were 464 (56,2%) males and 361 (43,8%) females in average age 57,5+8,4 yy. 315 (38,2%) pts belonged to III NYHA class and 510 (61,8%) - to IV. Body surface area (BSA) was 1,95+0,08 m². Average diameter of fibrotic annulus was 2,04+0,03 cm. Peak gradient on aortic valve was:103,7 + 15,3 (87-145) mm Hg. Operations were

performed by following methods: group A - AVR+ original method of reconstruction by PA (Popov V.) (n=89); group B - AVR with model 21 mm (n=379); group C- AVR with model 19 mm (n=357). The following patches were used: Vascutek`s (n=57), autopericardial (n = 11), bovine biocor SJM (n = 21). Only bileaflet prosthesis were used. Operations were performed in conditions of moderate hypothermia (27-32° C) and anteretrograde crystalloid cardioplegia (mainly Custadiol).
RESULTS: The hospital mortality were: group A - 4,5%; group B - 2,7; group C - 4,9% (p< 0,05). At discharge indexed effective orifice area (cm²/m²) and peak gradient on aortic prosthesis (mm Hg)(PGAP) were marked for: group A - 0,95+ 0,03 (PGAP = 22,3+ 2,7 mm Hg); group B = 0,88+ 0,03 (PGAP - 26,3+ 3,8); group C - 0,82+ 0,03 (PGAP = 35,3+ 5,2) (p< 0,05). At the remote period (average was 7,3± 0,9 yy) 753 (92,6%) pts were followed-up. In group A (n = 83) survival rate 83.4% and stability of good results 63.5% were observed at 7 years after operation. In group B (n = 343) survival rate 78.3% and stability of good results 23.3% were marked at 7 years after operation. In group C (n = 327) survival rate 49.3% and stability of good results 23.3% were occured at 7 years after operation. At remote period indexed effective orifice area (cm²/m²) and PGAP (mm Hg) were marked for: group A - 0,92 + 0,03 (PGAP = 21,3+ 2,3); group B - 0,84 + 0,04 (PGAP = 29,3+ 3,9); group C - 0,78 + 0,04 (PGAP = 42,3+ 4,7) (p< 0,05).
CONCLUSIONS: Reconstruction of NOA during AVR by proposed original method of posterior aortoplasty is effective intervention especially at remote period in group A. PPM was marked significantely in group C.

00325

Reconstruction of left part of the heart for mitral valve diseases

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BACKGROUND: To determine possibillities of correction of the left parts of the heart by preservation of MV`s apparatus and reduction of LA during MVR.
METHODS: During 2007 - 2016 yy. 91 adult patients (pts) were operated with mitral valve diseaes (MVD) and giant LA (diameter 60 mm and more) at Institute (group A). Average age was 49,2± 5,6 yy. 63 (68,9%) pts were in IY NYHA class and 28 (31,1%) in III class. There were used bileaflet prostheses (n = 56) monodisc type with orientation of the large margin to the posterior leaflet (n = 35). LA`s plasty was performed by Kawazoe`s method. Preservation of posterior leaflet (all pts) and translocatioon of anterior leaflet`s papillary muscles (n=45) was performed together with MVR. Concomitant procedure were occured on aortic valve (n =21) and tricuspid vave (n = 9). Combined anteretrograde St.Thomas cardioplegia and moderate hypothermia (27 -32 C) were used. Cross-clamping time of aorta was 93,4 ± 11,2 minutes. Control group (mitral inssuffiency) - only MVR without preservation of MV (n= 41) (group B).
RESULTS: There were 2 deaths at the hospital period (hospital mortality (HM) - 2,2%) (group A). The reasons of deaths were heart failure (1), brain damage (1). There aren`t any episods of bleeding, thrombembolic events or prostheses`s failure at the hospital and remote period. At the remote period (average was 5,3± 1,4 yy) 83 pts were followed-up. Sinus rhytm was preserved at 43 (47,2%) pts and there weren`t any deaths or unsatisfactive results. Data of echo for group A - end-systolic volume index (ESVI) (ml/m.sq.) - preoperative 62,8 ± 6,4, postoperative (6 -11 dd) - 54,4 ± 7,4 and at the remote period 49,6 ± 5,2 and diameter of LA (mm) preoperative - 62,4 ± 4,2, postoperative - 46,4 ± 4,2, remote period - 45,8 ± 3,6. No hospital mortality in group B. Data of echo for group B - ESVI - preoperative 81,8 ± 9,2, postoperative (6 -11 dd) - 74,6 ± 8,4 and remote period 72,4 ± 8,2 and diameter of LA (mm) preoperative - 72,4 ± 4,2, postoperative - 67,4 ± 6,2, remote period - 70,1 ± 8,4. In group B (n=41) there were episods of thrombembolic events (n=3), heart failure (n=4), prostheses`s failure (0). Sinus rhytm wasn`t marked in any pts and there were two deaths, unsatisfactive results (n=4 - 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 indixes of LV`s and LA`s morphometry, contractility during early and at the remote period comparing with group B. There weren`t any specific complications at the postoperative period in group A.

00205

The remote results after isolated aortic valve replacement

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BACKGROUND: The purpose of this study is to analyze the diverse characteristics of the long-term postoperative period after surgery for an appropriate isolated replacement of the aortic valve (AVR)
METHODS: 1354 patients with pathology of the aortic valve discharged after isolated ATS in the Institute for the period 2006-2008 were included in the analyzed group. This amounted to 94.7% of those discharged to the hospital stage. There were 783 (57.8%) men, women 571 (42.8%). The age of patients with this pathology was 20 to 72 years (an average of 52.7 ± 9.4 years). According to the classification of chronic heart failure NYHA, the following grades were observed: patients of the second class of functional class 98 people (7.3%), the group of patients of the third functional class was 544 people (40.2%) and patients of the IV class of heart failure respectively 711 people, which was 52 , 5% of cases. Atrial fibrillation as a stable violation of the heart rate was observed in 21 patients, which amounted to 1.5% of cases. When performing operations (implantation) cardiosurgeons used only mechanical aortic valve prostheses: (manufacturers: St. Jude, On-X, Carbomedica, ATS). A concomitant aorto-coronary shunt was observed in 93 patients, which amounted to 5.0% of cases.
RESULTS: The mean value was observed in the long-term after surgery 9.4 ± 0.7 g. After 10 years we observed the following results: survival of patients was 81.3%, stability of good results was 57.3%, freedom from thromboembolic complications of any localization was observed in 95,3%, freedom from repeated operations associated with complications of the previous prosthesis was observed in 97.1%%. There were repeated operations: thimbosis (panus) of aortic prostheses (n = 2), endocarditis of the prosthesis (n = 3). Atrial fibrillation was noted in 50 (3.7%) patients. Blockade of the atrio-ventricular node was observed in 48 (3.5%) patients. The main risk factors for the long-term period were identified: functional class IV, atrial fibrillation, left atriomegaly (atrium diameter 6.0 cm and more), ejection fraction less than 0.4, high pulmonary hypertension (PSP> 70 mmHg), left ventricular emission (ESVI> 95 ml / m2), progressive ischemic heart disease.
CONCLUSIONS: In the long-term postoperative period, in most cases, good results of surgical interventions with the use of mechanical aortic valve prostheses were observed. Certain basic criteria for better long-term results: the operation should be performed in the functional class of chronic heart failure NYHA II-III, with a sinus rhythm and good contractility of the ventricular myocardium.

SESSION: VASCULAR ABSTRACT SESSION I

TIME: 14:00-16:00
ROOM 3: STRASBOURG

00304

Totally implantable venous access port catheters for cancer patients

E. Depboylu [1], B.C. Depboylu [2], S. Yazman [3], B. Harmandar [4]

[1]Mugla Sitki Kocman University Training and Research Hospital, Anesthesiology and Reanimation Intensive Care Unit, Mugla, Turkey; [2]Mugla Sitki Kocman University, Faculty of Medicine, Department of Cardiovascular Surgery, Mugla, Turkey; [3]Mugla Sitki Kocman University Training and Research Hospital, Cardiovascular Surgery Clinic, Mugla, Turkey; [4]Mugla Sitki Kocman University, Faculty of Medicine, Department of Cardiovascular Surgery, Mugla, Turkey

BACKGROUND: Increase of cancers and advances in chemotherapy has been increased the use of port catheters. They reduce vascular com-

Primary Causes (malignancies)	Male (n=31)		Female (n=25)		Total (n=56)	
	n	%	n	%	n	%
Stomach Adeno Ca.	3	9,67	-	-	3	5,35
Non-small Cell Lung Ca.	4	12,90	-	-	4	7,14
Colon Adeno Ca.	13	41,93	9	36	22	39,28
High Grade Urothelial Ca.	1	3,22	-	-	1	1,78
Endometrium Ca.	-	-	1	4	1	1,78
Invasive Ductal Ca.	-	-	9	36	9	16,07
Squamous Cell Larynx Ca.	5	16,12	-	-	5	8,92
Prostate Ca.	2	6,45	-	-	2	3,57
Hodgkin Lymphoma	-	-	1	4	1	1,78
Pancreas Ductal Adeno Ca.	3	9,67	2	8	5	8,92
Maxillary Sinus Mucoepidermoid Ca.	1	3,22	-	-	1	1,78
Over Musinoz Ca.	-	-	3	12	3	5,35
Squamous Cell Parotis Ca.	1	3,22	-	-	1	1,78

Figure 1.

Comorbid diseases in 61 patients	*n*	*%*
Patients those have no comorbid diseases	15	24,59
Patients those have comorbid diseases	46	75,41
Hypertension	20	32,78
Diabetes	9	14,75
Hypothyroid	9	14,75
Peptic ulcus	8	13,11
Depression	6	9,83
Coronary artery disease	4	6,55
Hyperlipidemia	4	6,55
Renal insufficiency	3	4,91
Chronic obstructive pulmonary disease	3	4,91
Carotid artery disease	2	3,27
Epilepsy	2	3,27
Anemia	2	3,27
***Others (each)**	1	1,63

Figure 2.

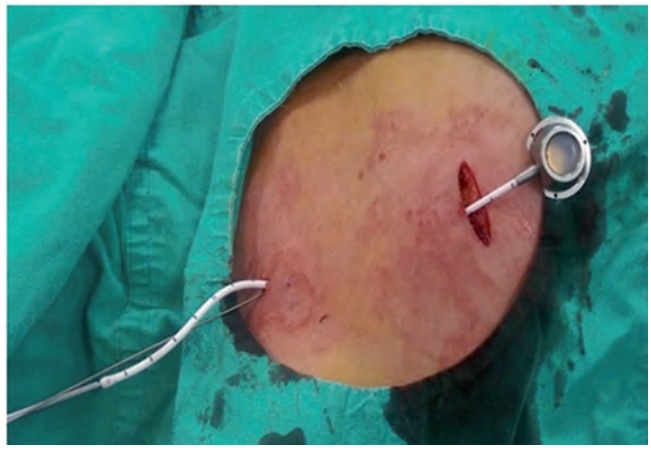

Figure 3.

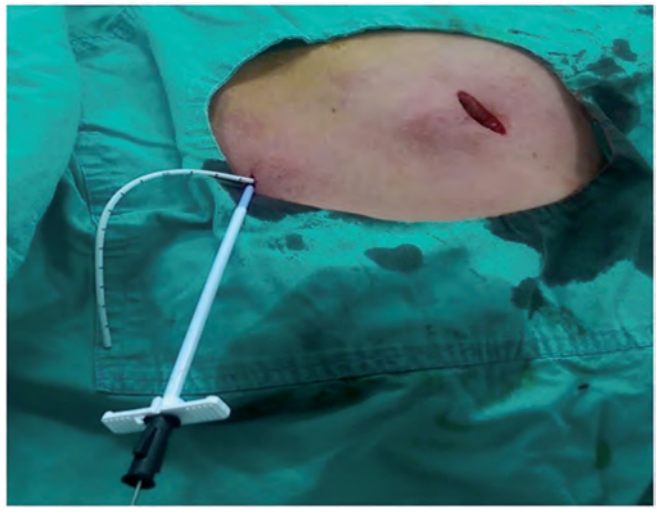

Figure 4.

plications of chemotherapy in patients with inappropriate veins, provide comfort for patients and users. Aim of this article is defining the most used surgical approach for port catheter implantation in our hospital, early and late complications, principles of use and maintenance.
METHODS: Port catheter implantation to right shoulder via right subclavian vein access was defined with original images. 71 interventions in 61 patients were summarized in context of literature. Continuous variables defined as mean ± standard deviation, categorical variables defined as percentages. IBM SPSS Statistics 22.0 (IBMCo.,Armonk,NY,USA) was used for analyzes.
RESULTS: Of the patients, 47.54%(n=29) were female, 52.45%(n=32) were male. Mean ages were 55,89 ± 11,69 for female, 62,56 ± 8,69 for male. 56 interventions were implantation, 15 were removal. Subclavian ven was the most used vein (85.71%(n=48)). Colon adeno carcinoma was the leading reason for implantation (39.28%(n=22)) (Figure 1). 51.78%(n= 29) of the patients had metastasis. Liver was the most metastatic organ (44.82%(n=13)). Leading additional disease was hypertension (32.78%(n=20)) (Figure 2). The only early complication was pneumothorax (2.08%(n=1)). Occlusion/thrombosis was the most common cause of removal (40%(n=6)). The most isolated microorganism on infected ports was Staphylococcus Aureus (75%(n=3)).
CONCLUSIONS: Port catheters can be easily implanted with Seldinger`s technique and simple surgical intervention. They provide comfort for patients and users. Due to serious early and late complications, attention should be given during implantation and use. Periodic maintenance shouldn`t be neglected.

00099

Endovascular treatment of the arteriovenous fistula between major abdominal arteries and veins after lumbar disc surgery

C. Guven [1], M. Ercisli [1], H. Iner [2], A. Pala [2], O. Gokalp [3], Y. Besir [3], N. Yesilkaya Karakas [4], I. Peker [5], A. Gürbüz [3]

[1]Adiyaman University, Faculty of Medicine, Adiyaman, Turkey; [2]Adiyaman Education and Research Hospital, Adiyaman, Turkey; [3]Izmir Katip Celebi University, Faculty of Medicine, Izmir, Turkey; [4]Ankara University, Faculty of Medicine, Ankara, Turkey; [5]Mardin State Hospital, Mardin, Turkey

BACKGROUND: Major vascular injury during lumbar discectomy is rare but life-threatening complication. During posterior instrumentation, which is frequently used in lumbar disc hernia surgery, passing the anterior longitudinal ligament with an instrument may cause retroperitoneal vascular injury. If the hemorrhage due to vascular injury limits itself and does not cause hemodynamic instability, the patient may be presented with a diagnosis of arteriovenous fistula or pseudoaneurysm weeks or even months later. We aimed to present a case that a patient who had L4-5 disc herniation operation history about 8 months ago, and diagnosed and treated arteriovenous fistula between aortic bifurcation and vena cava and right main iliac artery and right main iliac vein.
CASE REPORT: Our patient was a 33-year-old woman. The patient presented with edema and tension at the right lower limb, abdominal distension and dyspnea. We learned from the patient's medical history that approximately 8 months ago L4-L5 disc hernia operation was performed. Physical examination findings were jugular venous distention, sinus tachycardia (110 bpm), abdominal distension and sensitivity with palpation, edema and diameter increase at bilateral lower extremities, more at the right lower extremity. Intra-abdominal free fluid and hepatomegaly were determined by abdominal ultrasonography. Transthoracic echocardiography detected that right cardiac cavities were dilated, pulmonary artery pressure was increased (50 mmHg), there was an atrial septal defect (0.5x0.5 cm). IV contrast enhanced abdominal CT angiography confirmed hepatomegaly and ascites. Contrast enhancement was seen in the right iliac vein and vena cava inferior at the same time as the arterial structures. The appearance of the arteriovenous fistulas between aortic bifurcation and vena cava, and between the right main iliac artery and the right main iliac vein were observed. The right common iliac vein diameter was increased and the inferior vena cava reached a diameter of 68 mm due to the high flow rate. We planned endovascular treatment carefully. Endovascular aortic repair (EVAR) was performed and endovascular stent graft was placed to the common iliac artery by closing the right internal iliac artery. After 3 weeks from operation, all the complaints of the patient were dramatically regressed. The distal pulses of both lower extremities were palpable. At the control transthoracic echocardiography, the diameter of the right cardiac cavities were decreased and pulmonary artery pressure were reduced. And elective percutaneous closure of the atrial septal defect was planned. Control IV contrast-enhanced CT angiography showed complete repair of the arteriovenous fistulas. Late vascular complications should always be kept in mind in patients with invasive intervention such as lumbar disc surgery, spinal anesthesia etc. in clinical history. In appropriate cases, endovascular repair is effective and also an alternative method with lower mortality and morbidity rates than conventional surgery.

00245

Complex endovascular treatment of ruptured thoracic aneurysm in 92 yo male: technical success with clinical failure

R. Akchurin, T. Imaev, P. Lepilin, A. Komlev, A. Kolegaev, I. Medvedeva, I. Kuchin, D. Salichkin

Russian National Medical Research Center of Cardiology, Moscow, Russian Federation

BACKGROUND: Ruptured descending thoracic aneurysm is an urgent life-threatining condition with high values of mortality and morbidity. It is associated with extremely high risk of surgical treatment with a reported mortality rate of 25-45% for open repair (Schermerhorn *et al.*, 2008). Endovascular approach formely approved for elective thoracic aneurysm repair nowadays can be used as more safe and no less effective option especially in older patients with multiple comorbidities.
CASE REPORT: Patient K. 92 y.o., male, with non-traumatic ruptured thoracic aneurysm (maximal diameter =10cm) was transported to our clinic on day 3 from clinical manifestation of an acute aortic syndrome (chest and back pain) with left-side hemothorax, subtotal left lung atelectasis. Comorbidity: Arterial hypertension. Cerebrovascular disease. Transient ischemic attack (4.06.2017). Chronic renal insufficiency stage 2. ASA Physical Status Classification System Class V. Clinical presentation: weakness, shortness of breath, pallor of skin. Key laboratory investigation (at admission): · Hb - 86g/l, RBC - 2,8x10/l, PTL - ·Serum sodium level - 12mmol/l · Total protein 54 g/l. Treatment strategy was considered staged TEVAR and hematoma drenage. The main challenging point of procedure was to deliver the main device to proximal point of ascending aorta. Snare technique was used to deliver the main device (Valiant Captivia): due to giant aneurismal sac the tip (4cm) of Captivia delivery system was blocked in angulation of upper part of aorta. · Snare was delivered through left common carotid artery and Lunderquist wire was fixed and tighten between carotid artery and femoral access point. During the traction maneuver delivery system was placed to intact part of aortal arch (Fig. 1). On postoperative day 3 left thoracotomy was performed for evacuation of liquid in pleural cavity with thrombus evacuation. After that left lung obstruction was released. At day 5 post op tracheostomy was done and mechanical ventilatory support was prolonged. Unfortunately, the patient died at day 21 from progressive polyorganic failure.

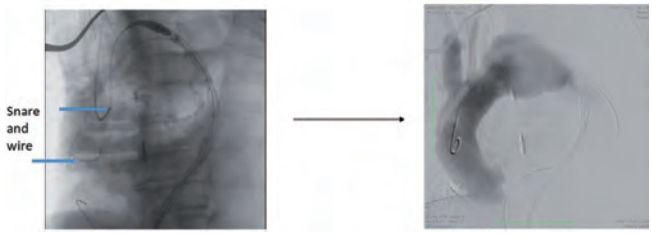

Figure 1.

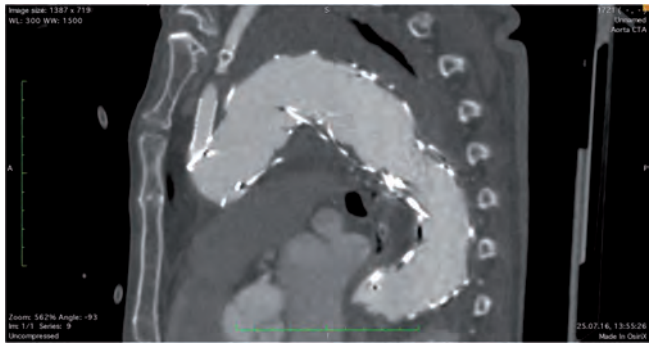

Figure 2.

00100

Our endovascular treatment approach to superficial femoral artery damage caused by gunshot injury

M. Ercisli [1], H. Iner [2], A. Pala [2], A. Surucu [1], O. Gokalp [3], L. Yilik [3], Y. Besir [3], K. Ergünes [4], I. Peker [5], A. Gürbüz [3]

[1]Adiyaman University, Faculty of Medicine, Adiyaman, Turkey; [2]Adiyaman Education and Research Hospital, Adiyaman, Turkey; [3]Izmir Katip Celebi University, Faculty of Medicine, Izmir, Turkey; [4]Izmir Katip Celebi University, Ataturk Education and Research Hospital, Izmir, Turkey; [5]Mardin State Hospital, Mardin, Turkey

BACKGROUND: In patients who are exposed to gunshot injury, peripheral arterial injury is an important condition that can cause the loss of the limb and even death if not been got under control. Here we aimed

to present a successful endovascular repair of superficial femoral artery (SFA) injury caused by gunshot at the right lower extremity.
CASE REPORT: A 23-year-old male patient was admitted to emergency department with a close range firearm injury (shotgun) at the right lower extremity. The vital signs of the patient, who was fully co-operative and orientated, were stable. On physical examination, at ½ middle of the right thigh on the antero-medial side there were multiple buckshot wounds. At the left lower extremity all distal arterial pulses were palpable, but the popliteal artery and distal arterial pulses at the right lower extremity were non-palpable. The intravenous contrast enhanced angio computed tomography was reported that the right superficial femoral artery was injured at the level of the canalis adductorius. Subsequently, peripheral digital subtraction angiography was performed. At the distal third of the superficial femoral artery, a single buckshot was seen which is adjacent to the artery and moves by pulse, and extravasation was observed from a single point at the same region. Upon this, an endovascular stent graft was placed to this segment. There was no leak at the control peripheral digital subtraction angiography. Blood flow was normal at the distal region of the injury. We ended the procedure. The postoperative evaluation revealed that all distal pulses of the patient's right lower extremity were palpable. There were no ischemic findings. The patient was discharged with full recovery on the 2nd postoperative day. In suitable cases where peripheral arterial injury is detected in the lower extremity, endovascular treatment option should be kept in mind in terms of efficacy and ease of use.

00028

Total arch repair after Zone 1 TEVAR using the left subclavian artery perfusion

T. Sueda, S. Takahashi, K. Keijiro
Hiroshima University, Hiroshima, Japan

BACKGROUND: Zone 1 or 2 TEVAR sometimes occurs Type 1a endoleak by birdbeak of stentgraft. We have 3 cases of type Ia endleak after 274 TEVARs. This case showed pseudorupture of aneurysm by type 1a endoleak and required semi-emergency total arch replacement usinh the left subclavian arterial perfusion. we discuss how to prevent thpe 1a endoleak after zone 1 or 2 TEVAR.
CASE REPORT: We present semi-emergency operation for type 1a endoleak using the left subclavian arterial perfusion.
OBJECTIVES: We performed 274 thoracic endovascular aneurysm repairs (TEVAR) for thoracic aortic aneurysms from 2011 to 2017. Among them, 6 cases required open conversion during postoperative period with removal of endograft. The causes of removal were 3 cases with type Ia endoleak, 2 cases with endograft infection and one case with new proximal intimal tear. We present 86 years old male of aortic arch saccular aneurysm (Fig.1) who received Zone1 TEVAR(Fig.2). Postoperative MDCT showed gradual increase of hematoma around aneurysm. We suspected it as an impending rupture of aortic arch aneurysm (Fig.3) and performed emergency removal of endograft and replacement of ascending and aortic aneurysm using one branched graft (Fig.4) with selective cerebral perfusion via the left subclavian artery perfusion (28 °C at rectal temperature).

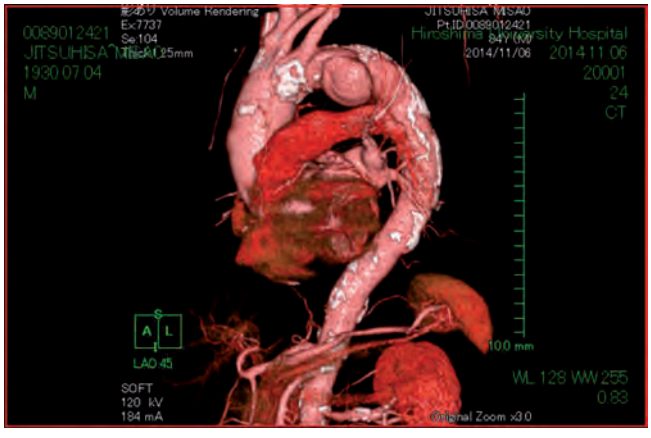

Figure 1.

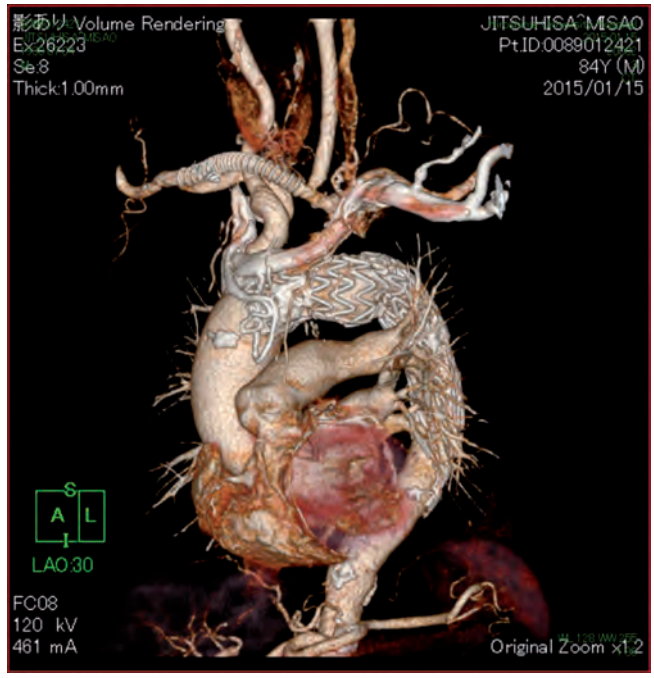

Figure 2.

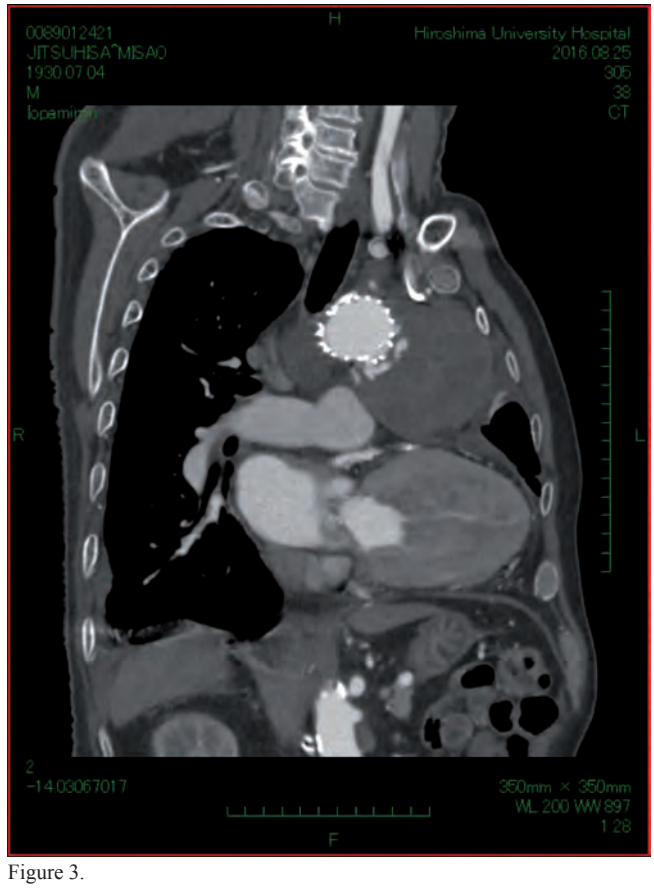

Figure 3.

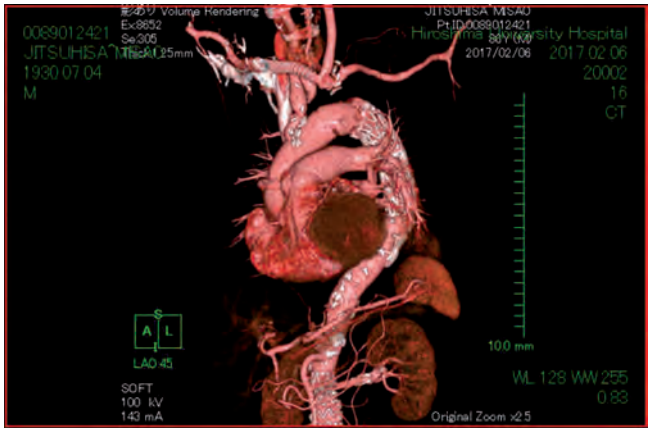

Figure 4.

RESULTS: The left subclavian arterial perfusion could supply all cerebral perfusion without selective cannulation into cervical branches because of preoperative debranching graft from the right subclavian artery to the left common carotid artery and the left subclavian artery.
CONCLUSIONS: Postoperative course was eventful, such as wound infection and pneumonia. But, he could discharge 2 months after operation and received rehabilitation in home.

00053

Endovascular treatment in the management of isolated bilateral common iliac artery disease patients: a case report

H. Cakir, I. Yurekli, Y. Gökkurt, B. Eygi, K. Dönmez, S. Iscan, K. Ergunes, A. Gürbüz

Department of Cardiovascular Surgery, Katip Celebi University Ataturk Education and Training Hospital, Izmir, Turkey

BACKGROUND: In the treatment of atherosclerotic peripheral arterial disease, endovascular treatment has begun to take place on the frontline, while surgical treatment options are predominantly present. Particularly the development of stent and balloon technology, the increased experience of invasive ventilation and the widespread use of hybrid operating conditions have been influential on this preference. Pioneering catheterization technics in patients who have been previously treated with medical therapy only has made it possible for these patients to be treated endovascularly. In addition, endovascular treatment appears to be highly advantageous for patient comfort compared to surgery and patients are more inclined to take the endovascular treatment as a first line of treatment. It is the complaint and expectation of the patient, which predominantly determines the treatment modality in cases of claudication. We aimed to present a 55-year-old male patient who had bilateral lower extremity intermittent claudication. He was on cilostazol therapy for 3 months with no improvement in his symptoms. Under digital subtraction angiography, we identified right main iliac artery occlusion and critical stenosis of the left main iliac artery. He was treated with a kissing stent implantation.

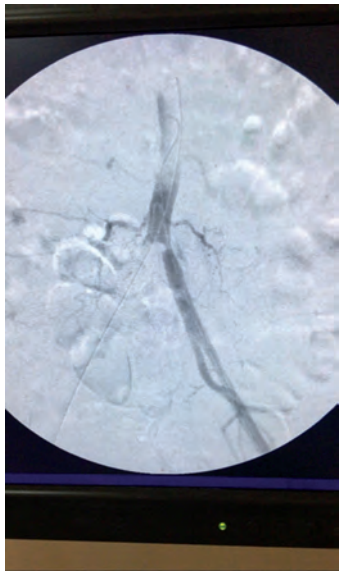

Figure 1.

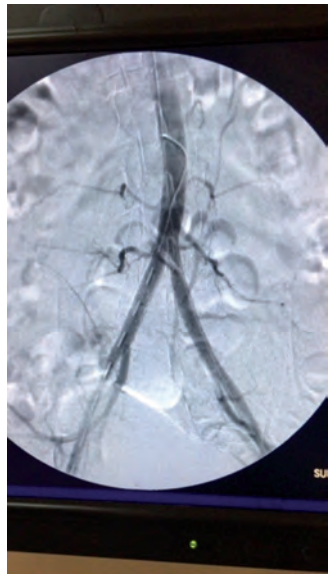

Figure 2.

CASE REPORT: A 55-year-old male patient was admitted to our outpatient clinic. He described a claudication intermittent complaint at bilateral lower extremity in 15 m. There has been no significant improvement in his complaints during his 3-month treatment with oral cilostazol. A digital subtraction angiography was performed at a different center revealing the80% stenosis in the left main iliac artery at abdominal aortic bifurcation whereas the right main iliac artery is occluded totally (Figure 1). The left lower extremity perfusion was seen to be well with the distal collateral circulation. The patient underwent the operation on a hybrid operating room under local anaesthesia. Sheaths were placed into femoral arteries bilaterally. Following balloon dilatation of the stenosis, kissing stents (Protege ®) were applied at each of the 2 major iliac bifurcation levels. The operation was terminated when full patency was achieved in all common iliac arteries (Figure 2). In the postoperative period, distal pulses were palpable by hand. The complaints of claudication were completely resolved. On the second postoperative day, the patient was discharged without any complications with double antiplatelet therapy (acetylsalicylic acid and clopidogrel). On the postoperative 30th day, he was seen in outpatient clinic with his distal pulses manually palpable and he had no complaint of claudication. Today, endovascular treatment is widely used in the treatment of peripheral artery diseases. Endovascular treatment has replaced surgical treatment in many patients. Endovascular treatment options are preferred more frequently than surgical treatment because of the short discharge period in the selected patients; there are fewer complications in the early period and thus the patients prefer endovascular modalities. In our case, endovascular treatment decision was made after 3 months of medical treatment with no significant decrease his complaints.

00038

Persistent type 2 endoleak after endovascular aneurysm repair (EVAR) in a patient with acute pulmonary embolism due to intracaval ruptured abdominal aortic aneurysm (rAAA)

M. Pipitone, M. D'Oria, B. Ziani, F. Griselli, C. Calvagna, A. Rotelli, F. Riccitelli, P. Cigoi, S. Chiarandini, R. Adovasio, F. Zamolo

Vascular and Endovascular Surgery, Cardiovascular Department, University Hospital of Cattinara ASUITs, Trieste, Italy

BACKGROUND: Endovascular treatment for aorto-caval fistula due to ruptured abdominal aortic aneurysm is usually controindicated. We report a case of a persistent type 2 endoleak after successful endovascular aneurysm repair of ruptured abdominal aortic aneurysm due to continuous flow from aorto-caval fistula. The patient was on anticoagulation therapy for concomitant acute pulmonary embolism. Uncertainty persists regarding the timing options and therapeutic strategies we could consider, in the emergency as well in the elective phase.
CASE REPORT: A 62-year-old male patient presented to emergency department with abdominal pain, nausea and vomiting which occurred three days before and still persisted at the time of observation. Physical exam revealed the presence of a pulsatile mass in the mesogastric region. The patient was in acute respiratory distress requiring noninvasive mechanical ventilation. Patient history was significant for hypertension, hypercholesterolemia, active smoking and coronary artery disease. He underwent urgent a computed tomographic angiography (CTA) which showed ruptured abdominal aortic aneurysm (rAAA) with maximal transverse diameter of 73mm with aorto-caval fistula. The inferior vena cava (IVC) below the site of rupture was markedly compressed by the aneurismal sac. Associated finding was the presence of acute pulmonary embolism with clot in the arterial tree of the left lower lung lobe (probably due to distal embolization of preexisting thrombus in both the AAA and IVC). The same day the patient underwent endovascular aneurysm repair (EVAR) to treat rAAA and exclude the aorto-caval fistula but, because of concomitant anatomic factors (as large volume of the aneurysm, inferior mesenteric and lumbar arteries patency, and presence of active aorto-caval fistula), a type 2 endoleak (EL) was present at the final angiographic control. Given the pulmonary problem we decided to postpone the treatment of the type 2EL. In the meanwhile the patient was transferred to the intensive care unit and given low molecular weight heparin at therapeutic dosage. Three day after the procedure the patient underwent CTA which showed persistence of the type 2EL with contrast flow in the IVC still compressed by the aortic sac. Furthermore the CTA confirmed the infarction of the left lower lung lobe. On postoperative day 7 the patient underwent an operative angiography (with left brachial access) with successful retrograde embolization of the lumbar arteries through the hypogastric arteries. Retrograde embolization of the inferior mesenteric artery was not feasible as the brachial access did not consent enough shaft. The final angiography showed a persistent low-pressure type 2EL from the aorto-caval fistula. Ten days after EVAR and due to persistency of the aorto-caval fistula, the patient underwent an operative angiography (left femoral access) with successful retrograde trans-superior embolization of the inferior mesenteric artery and aortic sac. The final angiographic control showed absence of any residual type 2EL. 24 days after the index procedure the patient had a contrast-enhanced ultrasound which demonstrated recurrence of the type 2EL filled from the aorto-caval fistula. There was otherwise evidence of sac shrinking (maximal transverse diameter 68 mm). The patient refused any further treatment at this time and was discharged at home on oral anticoagulation. He did not present at the fixed appointments for outpatient follow-up.

00054

Surgical treatment strategy for type II aortic dissection after coronary artery bypass graft surgery: a case report

H. Cakir, L. Yilik, B. Eygi, I. Yurekli, K. Ergunes, K. Dönmez, S. Iscan, A. Gürbüz

Department of Cardiovascular Surgery, Katip Celebi University Ataturk Education and Training Hospital, Izmir, Turkey

BACKGROUND: Treatment for acute type II dissection is emergency surgery. The planning of surgical treatment for chronic type II dissection is decided according to the condition of the complications. The dissections are usually more common in hypertensive patients with atherosclerotic risk factors and those with connective tissue disease. It can also be seen during coronary angiography and iatrogenic dissections can be seen due to previous cardiac surgery. We would like to present a 53-year-old male patient who underwent coronary artery bypass graft surgery at a different center and who underwent surgery for ascending aortic graft interposition, the surgery revealed aneurysmatic type II dissection at the 6th month after surgery.

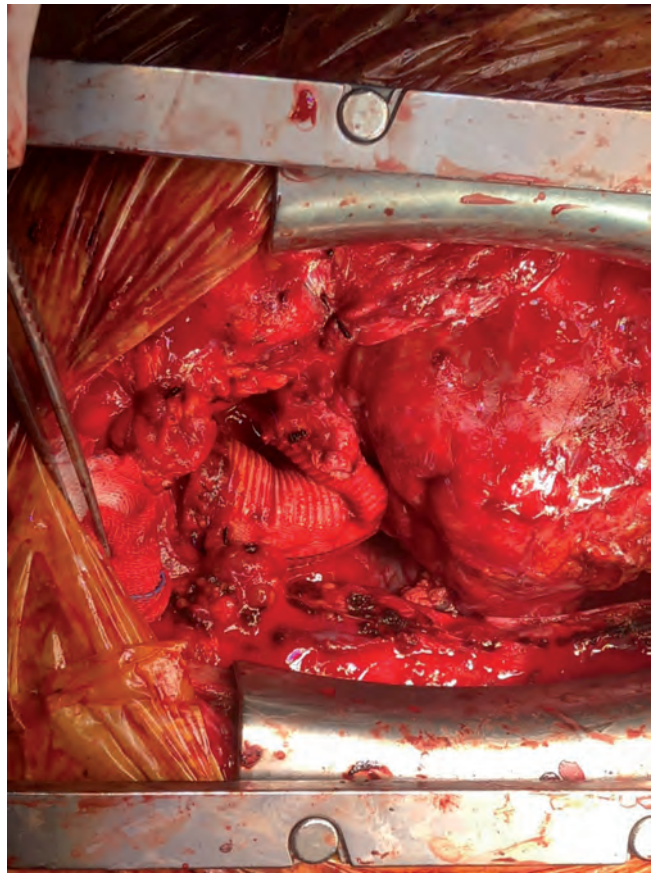

Figure 1.

CASE REPORT: Echocardiography of the patient who was referred to the emergency department with hypertension revealed ascending aortic flap. The patient's history revealed that he had coronary artery bypass graft surgery in a different center 6 months ago (during the coronary artery bypass graft surgery, there was neither an ascending aortic dissection nor any aneurysm). His medical history also revealed he suffered hypertension for many years. A type II dissection was detected in the performed computerized tomography. The diameter of the ascending aorta was measured as 64 mm. The patient was admitted to our clinic with a diagnosis of chronic aneurysm with type II aortic dissection. It was detected by the coronary angiography that the coronary grafts were patent. There was no aortic regurgitation in echocardiography. The patient was prepared for elective surgery. Right subclavian artery and left femoral venous cannulations were performed. The computed tomography showed that the ascending aorta was in avery close proximity to the sternum that is why left femoral vein was chosen for cannulation. Redo sternotomy was done. The ascending aorta was dissected. The saphenous vein grafts were checked for patency. Aortotomy was performed after ascending aortic cross clamping. Proximal anastomoses of saphenous vein grafts were prepared in an island form. The interposition of aortic graft was performed under anterograde cerebral perfusion and deep hypothermia (the proximal anastomosis was performed under a cross clamp). The arterial cannula was replaced on to the graft and antegrade

cerebral perfusion was terminated and the cardiopulmonary bypass was restarted. The proximalanastomose of the saphenous vein grafts which were prepared in an island form was anastomosed to the ascending aortic graft in an end to side fashion (Figure 1). The patient had an uneventful intensive care and hospital stay and he was discharged at the 7th day. The planning of surgical treatment for chronic dissections depend on the complications and hemodynamic stability of the patient. The elective surgery decision was made because the patient had aneurysmatic dilatation of the ascending aorta. The type II dissection is a rare complication of coronary artery bypass graft surgery. The absence of ascending aortic aneurysm and dissection before coronary artery bypass graft surgery suggests that the current type II dissection occurred due to coronary artery bypass graft surgery. Patency of the existing saphenous vein grafts can further complicate procedure for the surgeon. Anastomosis of proximal ends of saphenous vein grafts prepared as an island form seems to be a very useful technic in cases like this one.

00191

Double-stage hybrid repair of a complex abdominal aortic aneurysm

A. Pelouze [1], G.A. Pelouze [2]

[1]Geneva University Hospital, Geneva, Switzerland; [2]Saint John Hospital, Perpignan, France

BACKGROUND: Abdominal aortic aneurysm is not a rare pathology and endovascular treatment is an elegant and convenient way to treat this pathology whenever the anatomy is favorable. In most atypical anatomical cases surgeons must be prepared to face challenging approach. This double hybrid case shows how endovascular treatment can still be done without median laparotomy in unfavorable anatomical cases.
CASE REPORT: A 68 years old male patient presented in our consultation for abdominal discomfort due to abdominal beating mass. Past medical history was remarkable for: hypertension, stroke, left internal carotid thrombosis, left nephroureterectomy in 1998, smoking and alcohol abuse. On Abdominal auscultation an umbilical mass was found, painless, swinging and expansive despite a negative De Bakey sign. Initial computed tomography images confirmed the diagnosis of a complex suprarenal abdominal aneurysm of 54 mm in diameter. The aneurysm consisted of two separated dilatations: a saccular aneurysm at the suprarenal level below the celiomesenteric trunk and a saccular aneurysm at the level of the right renal artery, which extends to the bifurcation of the aorta. The complex anatomy showed several abnormalities, first the celiac trunk and the mesenteric artery were sharing the same origin described as celiomesenteric trunk a rare entity, second the patient underwent a left nephrectomy 19 years ago, third the right renal artery takes his origin relatively low under the celiomesenteric trunk and is accompanied by an important right polar renal artery. We did not consider Endovascular aneurysm repair (EVAR) as a first treatment option due to this unfavorable and complex anatomy. We considered for our patient a double stage hybrid procedure where we first made a debranching of the celiomesenteric trunk, the right renal artery and the right polar renal artery using a branched hybrid vascular graft by a postero-lateral retroperitoneal approach. The second stage consisted of a classical endovascular treatment of the remaining aneurysm using a Gore® Excluder® AAA endoprosthesis. Preoperative management was done as per our protocol. With patient consent we planned the surgery.
In October 2017 we first performed the debranching procedure, on the thoracic aorta we performed a proximal anastomosis of the branched hybrid vascular graft. An end-to-end anastomosis of the graft with the celiomesenteric trunk was then performed. The nitinol stent was passed behind the pancreas, in front of the aneurysm and using the Seldinger technique we dilated the right renal artery with a coronary balloon and then deployed the stent of the hybrid graft. Finally we proceeded to the end to side anastomosis of the right polar renal artery on the stent free zone of the hybrid graft. The second stage of the treatment was done few weeks later. The patient remained apyretic without any complication. We performed a classical endovascular treatment of the remaining aneurysm using a Gore® Excluder® AAA Endoprosthesis. A percutaneous approach of the left common femoral artery was done and the prosthesis was positioned under fluoroscopy just below the implantation of the hybrid graft. We then implanted the controlateral leg using a right-sided femoral approach. After controls of the patency of our vascular hybrid graft and of the endoprosthesis we transferred the patient in post interventional intermediate care unit for surveillance. Without complication the patient was discharged at day 2 after surgery. The patient is alive and well. Renal function was followed and showed no aggravation; a first control of the endoprosthesis was done using a duplex study showing no endoleak. An angio CT was performed at 2 months showing full permeability without endoleaks.

00067

Endovascular approach (with Cardiatis® stent) to thoracoabdominal aortic aneurysm in a patient with renal transplantation and essential thrombocytosis: case report

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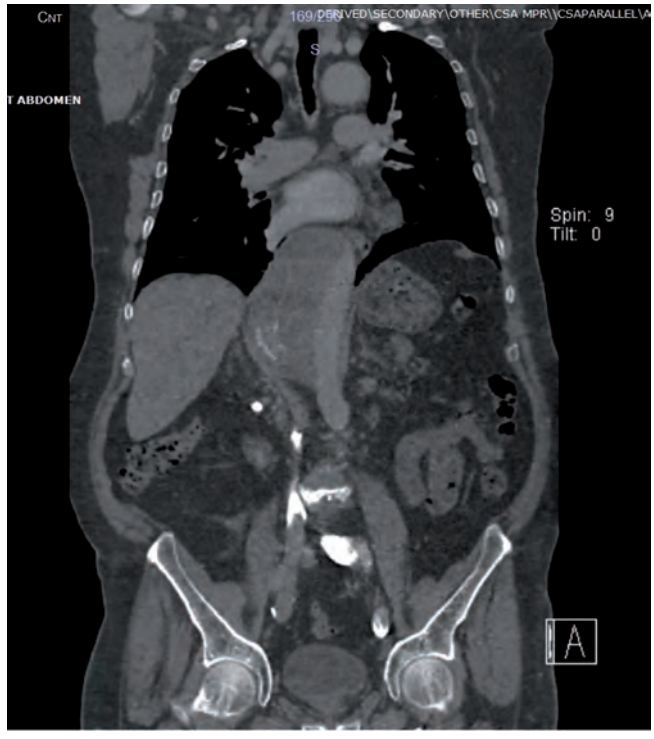
BACKGROUND: Endovascular treatment has been widely used in the treatment of aortic aneurysms in recent years. Endovascular methods are routinely preferred in the treatment of infrarenal abdominal aortic aneurysms at anatomically appropriate patients. In endovascular treatment of aortic aneurysms including renal, mesenteric, and celiac arteries, specific stent grafts must be used to ensure that these vessels remain open. Branched grafts and fenestrated grafts are used for this purpose. One of these special stents is the Cardiatis® stent. We aimed to present endovascular treatment of a 63-year-old male patient who had thoracoabdominal aortic aneurysm (including celiac, superior mesenteric, and renal arteries), kidney transplant and essential thrombocytosiswith Cardiatis® stent.
CASE REPORT: Patient who had no complaints and had newly diagnosed thoracoabdominal aortic aneurysms at routine checkup was hospitalizedfor endovascular treatment. Computed tomography revealed a saccular aneurysmatic dilatation extending from the T9 vertebra level to abdominal level and extending along a segment of approximately 15 cm, ending at right renal artery level (Figure 1).



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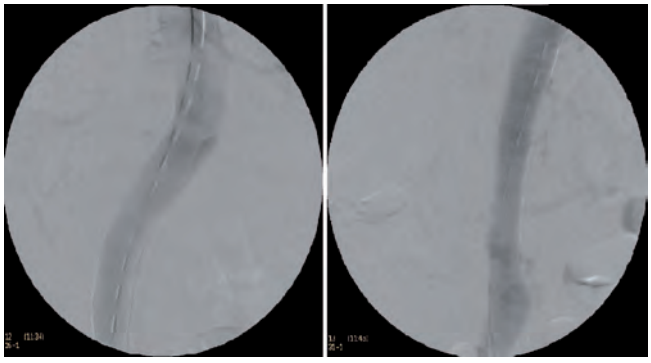

Figure 2.

In his medical history, he had kidney transplant due to chronic renal failure and essential thrombocytosis. Renal artery was anastomosed to the right main iliac artery. With the concern that the endovascular stent may be thrombosed due to essential thrombocythemia, a preoperative hematology consultation was requested, and the patient underwent hydroxyurea treatment. Thrombocythemiaregressed with hydroxy urea treatment. Patient's computerized tomography was examined and the appropriate Cardiatis® stent was obtained. Patient underwent operation under general anesthesia at hybrid operation theater. The left main femoral artery was explored. The left main femoral artery was decided to be used because renal artery was anastomosed to the right renal artery. Endovascular aneurysm repair was performed using Cardiatis® stent. Control angiography was performed (Figure 2). In the postoperative period, urine output gradually decreased. Nephrology consultation was requested. Proper medical treatment was arranged, and urine output became normal. The patient was discharged on the 7th postoperative day. On the 30th day there was no problem in out-patient clinic control. Endovascular treatment of thoracoabdominal aortic aneurysms is a complex issue. In recent years, endovascular treatment of these patients is more frequently performed because of the evolving stent technology and increasing interventional experience of surgeons. Cardiatis® is one of the stents that can be safely used in the treatment of this group of patients. Thrombosis risk of stentsplaced to patients with essential thrombocythemia is an important problem. In these patients' endovascular intervention may be performed by reducing platelet counts with hydroxyurea treatment.

00366

Aortic arch aneurysm surgery avoiding circulatory arres

V. Papestiev [1], M. Cirkovic [2], N. Lazovski [1], M. Shokarovski [1], D. Babic [2], N. Mehmedovic [1], S. Dameska [1], S. Jovev [1]

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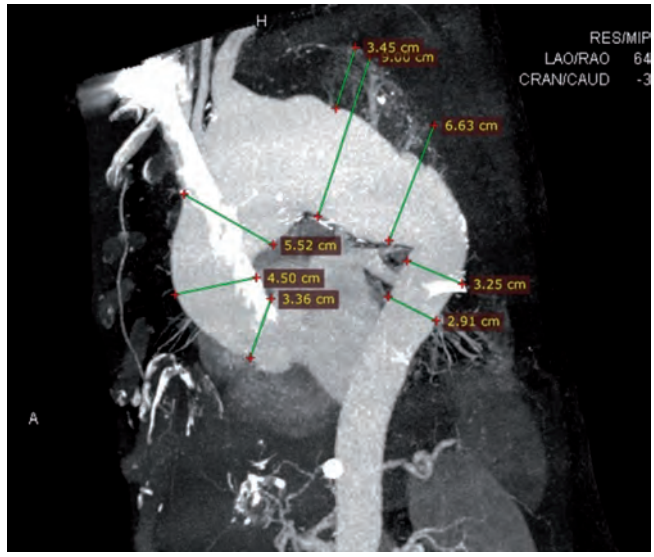
BACKGROUND: Aortic arch aneurysm is a rare entity with high morbidity and mortality. Deep hypothermic circulatory arrest is an effective cerebral protection technique and has widely been used in aortic arch surgery. Antegrade selective cerebral perfusion provides longer periods of circulatory arrest. It is usually conducted during fashioning of the distal end-to-end anastomosis between the transected ascending aorta and the tube-graft, whether it is done in a conventional or hybrid way.
CASE REPORT: We report a case of a 55 years old male patient who was admitted to our department with acute back and chest pain. CT angiography revealed ascending, arch and proximal descending aorta aneurysm. Maximum diameter of aneurysm was measured distal to the subclavian artery, 9 cm. Additional finding was intramural hematoma of the proximal descending aorta. Aneurysm extended to the mid descending aorta. Below that level aorta was near normal diameter. The patient was transferred to the OR for the urgent surgery. Two-incision technique was used (median sternotomy and left anterolateral thoracotomy). Cardiopulmonary bypass was established percutaneously via femoral vessels. Left axillary artery cannulation using 8-mm side arm graft was performed for antegrade selective cerebral perfusion. Firstly, preparation of the supra-aortic branches and distal thoracic aorta was performed. Afterwards cardiopulmonary bypass was established. After clamping distal to the supposed anastomosis, at the level of the normal aortic diameter, we fashioned distal end-to-end anastomosis between the aorta and Dacron graft. Lower body perfusion was performed through the femoral cannulation. Three intercostal back bleeding arteries were ligated. The ascending aorta was cross-clamped, and cardiac arrest was induced by antegrade cold blood cardioplegia. In the next step we opened and resected aneurysm after supra-aortic vessels clamping and institution of selective antegrade cerebral perfusion. Island implantation of the supra-aortic vessels was done in the anterosuperior surface of the graft. The last anastomosis performed was the graft and the sinotubular junction. After properly de-airing of the heart, spontaneous conversion to sinus rhythm and adequate management of surgical hemostasis the patient was successfully weaned from the bypass. The



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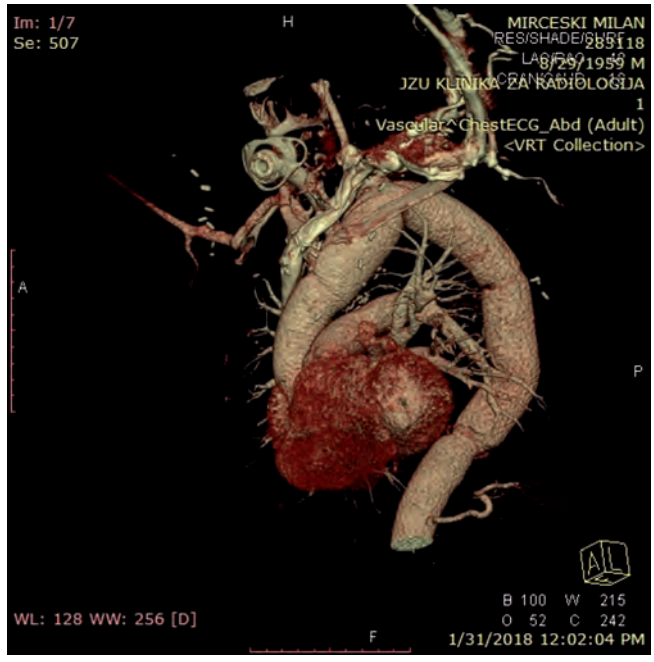


Figure 2.

obypass procedure was performed in mild hypothermia (32 oC). The postoperative course was uneventful. The patient was discharged on the 14th postoperative day. We believe that this surgical approach (median sternotomy and left anterolateral thoracotomy) is less traumatic than the usual trap door or clamshell incision and still provides excellent exposure. Selective antegrade cerebral perfusion and lower body perfusion in conjunction with distal aorta cross-clamping gives us the opportunity to avoid deep hypothermic circulatory arrest. We believe that this could be safe and reproducible ''one-stage'' operative solution for subsequent complete remodeling of the aorta for institutions without available novel options like hybrid prostheses. It might be even used in scenarios where hybrid prostheses are not a choice, as we believe was in our case, due to distal aneurysm extension.

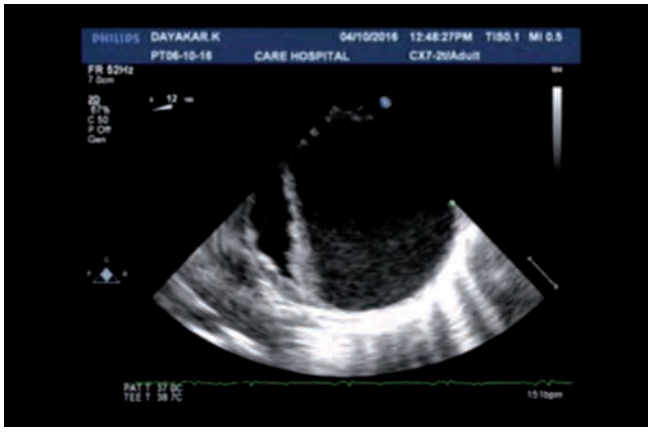
00251

Role of ascending aortic wrapping in thoracic endovascular for type B dissection: a single case report

N.S. Vasireddy [1], R. Gutti [1], P.C. Gupta [2], N.R. Goli [3]

[1]Department of Cardiothoracic and Vascular Surgery, care hospitals, Banjara Hills, Hyderabad, India; [2]Department of Vascular Surgery, Care Hospitals, Banjara Hills, Hyderabad, India; [3]Department of Cardiothoracic and Vascular Surgery, Care Hospitals, Banjara Hills, Hyderabad, India

BACKGROUND: Role of aortic wrapping in treatment of aortic type A dissection, aneurysm of ascending aorta has been a topic of discussion. We present here a case of acute type B dissection, treated with arch vessel debranching and aortic wrapping followed by Thoracic endovascular repair. Aortic wrapping procedure has been done in aneurysmal ascending aortic dilatation, as an emergency in type A dissection followed by TEVAR, in high risk elderly patients. We have done aortic wrapping in our case to create a landing zone for the endovascular stent in type B dissection.
CASE REPORT: A 52 year old male, known case of rheumatoid arthritis, chronic kidney disease, hypothyroidism presented with shortness of breath on walking and sudden onset chest pain in the interscapular region. He was evaluated by 2D Echocardiography, Trans esophageal echocardiography, Aortogram, all of which showed intimal flap just distal to subclavian artery extending upto proximal left common iliac artery. Major abdominal blood vesels were arising from true lumen. Arch vessel debranching, Subclavian to Carotid anastomosis, aortic wrapping to decrease the size of ascending aorta upto 30mm to create landing zone (ZONE 0) for TEVAR was done. On the first post operative day patient was stable neurologically and hemodynamically. Thoracic endovascular aortic repair with ZENITH 2PT-34-197-PF (proximal diameter-34 mm, length-197mm) was done on the first postoperative day. Patient was extubated on second post operative day. Inotropic support was weaned off on third post operative day and the patient was discharged on 7th post operative day. Follow up of patient at 6 months by a aortogram showed no dilation of ascending aorta and no endoleaks. Short and midterm outcomes of aortic wrapping in a case of mildly dilated ascending aorta with stanford type B aneurysmal dissection has good results. Hence it can be considered as a treatment option. Long term outcomes need to be evaluated.



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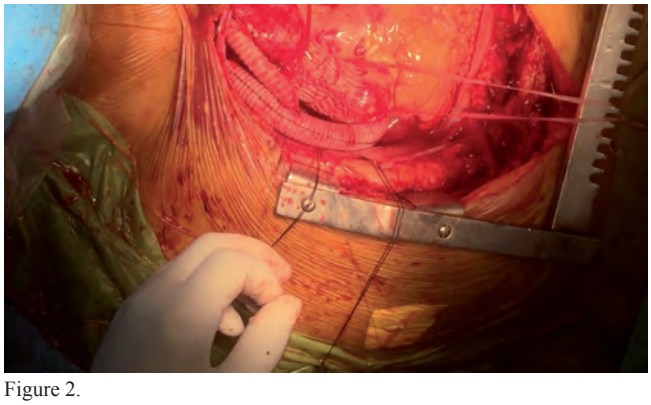
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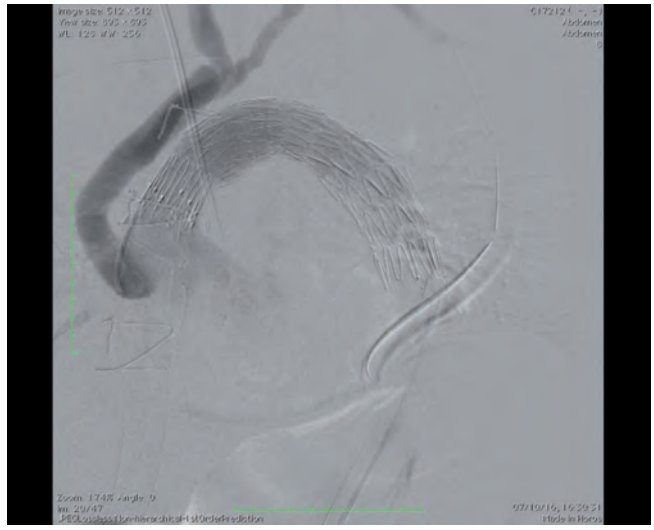
Figure 3.

00258

Intramural hematoma in the thoracic aorta: diagnosis and treatment

M. Szostek [1], W. Jakuczun [1], G. Szostek [2], S. Toutounchi [1], E. Krajewska [1], R. Pogorzelski [1], M. Szostek [1], T. Ostrowski [1]

[1]Dept. of General Surgery, Medical University of Warsaw, Warsaw, Poland; [2]Dept. of General Vascular Surgery and Transplantation, Medical University of Warsaw, Warsaw, Poland

BACKGROUND: Intramural hematoma (IMH) is the result of rupture vasa vasorum in the media layer of aortic wall and bleeding into the muscular membrane. Affect about 6% of all non-traumatic acute pathologies of aorta, most common patients with chronic hypertension, in age above 60 and is not related to the sex. In more then one third of cases leads to aortic dissection if re-entry goes back to the lumen of aorta or in the same ratio can spontaneously heal up with completely resorption. Has very high risk of rupture. Due to localisation site the classification of IMH is like the Stanford classification of aortic dissection: IMH type A concerning ascending aorta and aortic arch and IMH type B affecting descending thoracic aorta. IMH type A more often provide to dissection (28-47%) and has higher death rate (20-45%). Although IMH type B might be treated successfully conservative.
METHODS: In our Dept. 3 patients with confirmed intramural hematoma of thoracic aorta were treated. In all cases the reason of admission to the hospital was acute pain in the chest accompanying high blood

pressure. No heart insufficiency was diagnosed nor ischemia of the limb or viscera. In computed tomography the diagnosis of intramural hematoma was confirmed localized at the level of aortic isthmus just below the left subclavian artery. Due to very high hypertension the intensive treatment was provided. After blood pressure normalisation pain in chest resolved. Patients were not operated and discharged from the hospital. In follow-up 2 patients remains asymptomatic, in angio-CT completely resorption of the hematoma was found but in one case in angio- CT the progression of the disease occurs revealing dissection type St B. This patient was immediately operated. Thoracic stent-graft was inserted just below left subclavian artery. Postoperative period was uneventful.
RESULTS: In early as well as in 6 years long-term follow-up no complications were observed. CT-scan performed every six months in first two years and then every year, revealed good positioning of stent-graft with no sign of endoleak. Other two patients are follow-up in out-patient clinic and are also asymptomatic with completely healed thoracic aorta.
CONCLUSIONS: 1. IMH is rather rare disorder affecting thoracic aorta 2. Progression of the disease might provide to thoracic aorta dissection. 3. Endovascular procedure seems to be good option for complicated IMH

00264

Role of ascending aortic wrapping in thoracic endovascular repair for type B aortic dissection: a single case report

N.S. Vasireddy [1], R. Gutti [1], P.C. Gupta [2], N.R. Goli [1]

[1]Department of Cardiothoracic and Vascular Surgery, Care Hospitals, Banjara Hills, Hyderabad, India; [2]Department of Vascular Surgery, Care Hospitals, Banjara Hills, Hyderabad, India

BACKGROUND: Role of aortic wrapping in treatment of aortic type A dissection, aneurysm of ascending aorta has been a topic of discussion. Aortic wrapping procedure has been done in aneurysmal ascending aortic dilatation, as an emergency in type A dissection followed by thoracic endovascular repair, in high risk elderly patients. We have done aortic wrapping in our case to create a landing zone for the endovascular stent in type B dissection. In our case the acute type B dissection was treated with aortic arch vessel debranching, subclavian to carotid anastomosis and aortic wrapping followed by Thoracic endovascular repair.
CASE REPORT: A fifty two year old male, known case of rheumatoid arthritis, chronic kidney disease, hypothyroidism presented with shortness of breath on walking and sudden onset chest pain in the interscapular region. He was evaluated by two dimensional echo cardiography, Trans esophageal echocardiography, CT Aortogram. Aortogram showed intimal flap just distal to subclavian artery extending upto proximal left common iliac artery (type B aortic dissection) . Major abdominal blood vesels (superior mesentric artery and renal arteries) were arising from true lumen. Arch vessel debranching, Subclavian to Carotid anastomosis in the neck were done. Aortic wrapping to decrease the size of ascending aorta upto 30mm by using a sleeve of dacron graft (9.5cm length of 30 mm diameter graft) using the formula desired diameter multiplied by 3.14 or 22/7 was used to create landing zone (ZONE 0) for TEVAR was done. On the first post operative day patient was neurologically and hemodynamically stable. Thoracic endovascular repair with ZENITH 2PT-34-197-PF (proximal diameter-34mm, length-197mm) was done on first post operative day. The patient was extubated on the second post operative day. Inotropic support was weaned off on the third post operative day. The post operative period was uneventful and the patient was discharged on 7 th post operative day. The patient was followed up at one week, one month, six months and one year. Follow up of patient at 6 months by an aortogram showed no dilation of ascending aorta and no endoleaks. At one year patient was asymptomatic and the 2D Echocardiography showed no dilatation of ascending aorta. Short and midterm outcomes of aortic wrapping in a case of mildly dilated ascending aorta with stanford type B aneurysmal dissection has good results. Hence it can be considered as a treatment option.Long term outcomes need to be evaluated.

00268

Unexpected rupture of popliteal artery and vein due to blunt trauma

B.C. Depboylu [1], S. Yazman [2], B. Harmandar [1]

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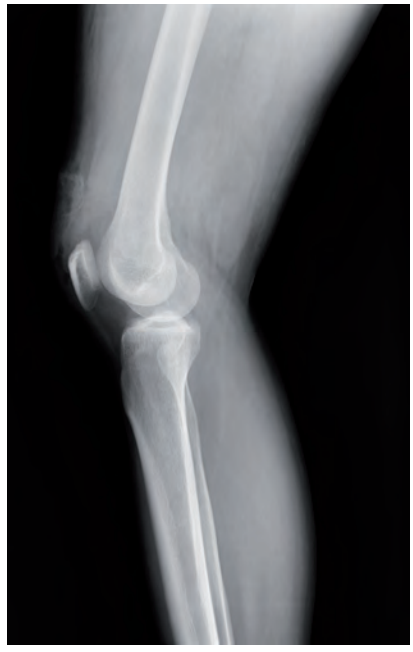
BACKGROUND: Popliteal artery injuries are the most extremity threatening ones with 5-19% percent of all artery injuries. Particularly in blunt extremity traumas, if there is no fracture or open wound which may cause to vascular injury, their diagnosis may be difficult. The lost time until diagnosis and intervention may cause loss of extremity and/or mortality. Here, we reported totally rupture of right popliteal artery and vein due to blunt trauma of both lower extremities.
CASE REPORT: A 33 years old male patient was referred to an emergency clinic with blunt trauma of both lower extremities due to traffic accident. In physical examination and direct roentgenograms, no fracture and no knee dislocation were revealed (Figure 1). Both extremities were warm and distal pulses were palpable. In the right lower extremity, above the knee level, echymosis, swelling and pain were present (Figure 2). Firstly, they had been thought as the characteristic of blunt trauma. However, during the follow up of the patient in the emergency clinic, the pain in the right lower extremity increased and distal pulses became weak. The patient was referred to the cardiovascular surgery clinic. Doppler ultrasonography performed to right lower extremity. Active bleeding and hematoma were revealed. The patient was transferred to the operating room. In the exploration of the popliteal artery and vein, it was seen that both vessels were totally ruptured (Figure 3).



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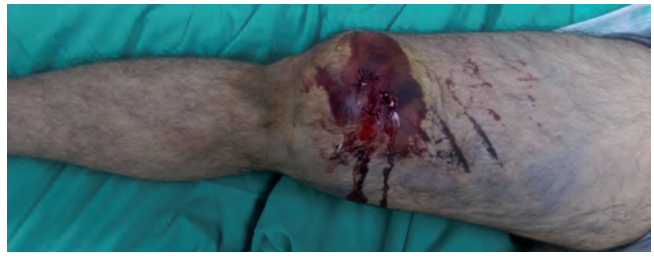

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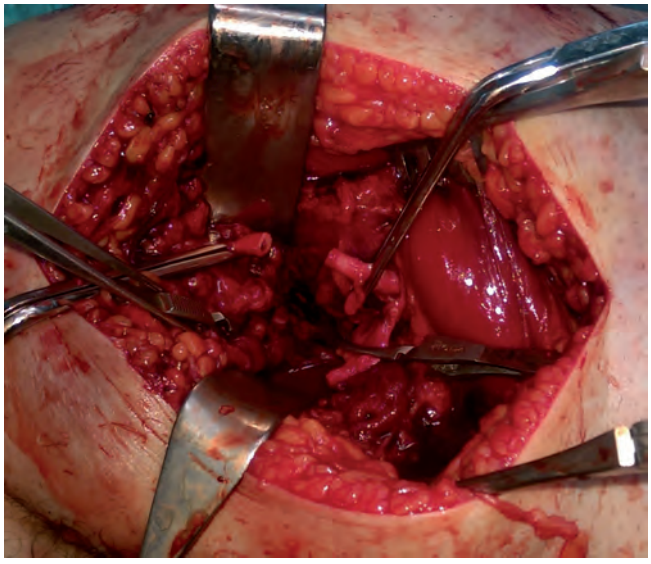

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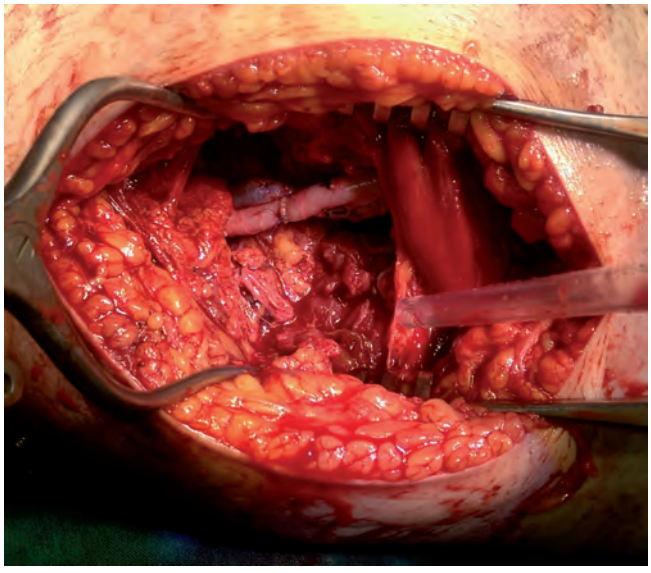

Figure 4.

The muscles were also crushed. End to end anastomosis were performed to both popliteal artery and vein (Figure 4). Faciatomy was performed to medial compartment. After the operation, the patient followed up in the intensive care unit because of the excessive increase in myoglobin, creatine kinase (CK) values and hemodynamic instability. On the postoperative 6 th day medial fasciatomy had closed. The patient had taken to cardiovascular surgery clinic on the 7th day. His clinical follow up was uneventful and he was discharged on the postoperative 16th day with mild neurologic defect.

00283

Successful hybrid repair of type B aortic arch dissecting aneurysm: case report

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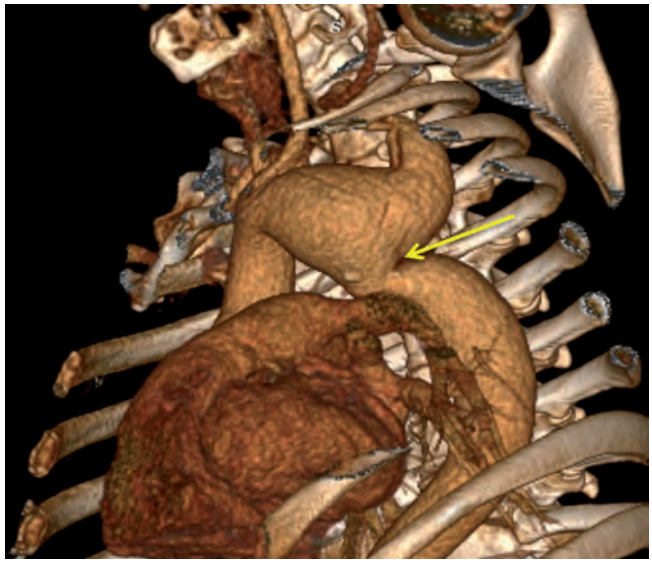
BACKGROUND: The article presents a clinical case of emergency hybrid surgical treatment of aortic arch dissection with the formation of aneurysm in a patient with aortic coarctation for the first time revealed: a one-stage carotid-carotid, carotid-subclavian bypass and endovascular aneurysm isolation.

CASE REPORT: A 38-year-old man was admitted in our Centre to the emergency room with clinical suspicion of acute coronary syndrome. Symptoms and duration: one month history of increased chest pain. Past medical history: nil relevant. Instrumental examination: emergency cardiac echography: ejection fraction (EF) - 60% (Simpson), no a-/hypokinesia, the ascending aorta - 34 mm,



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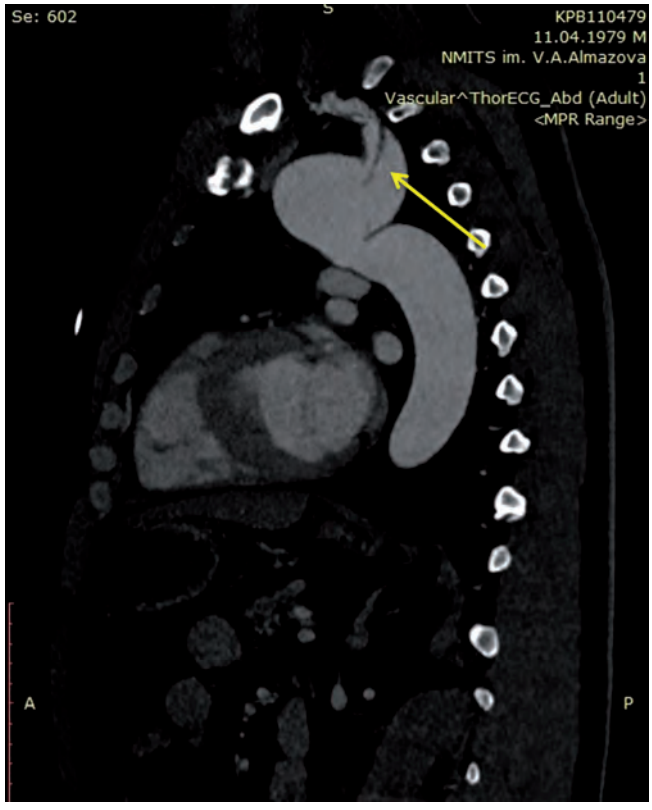

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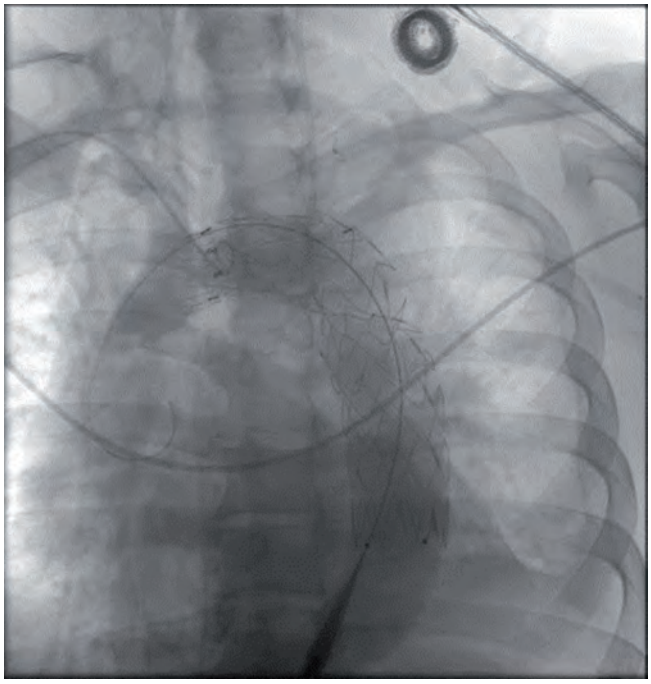

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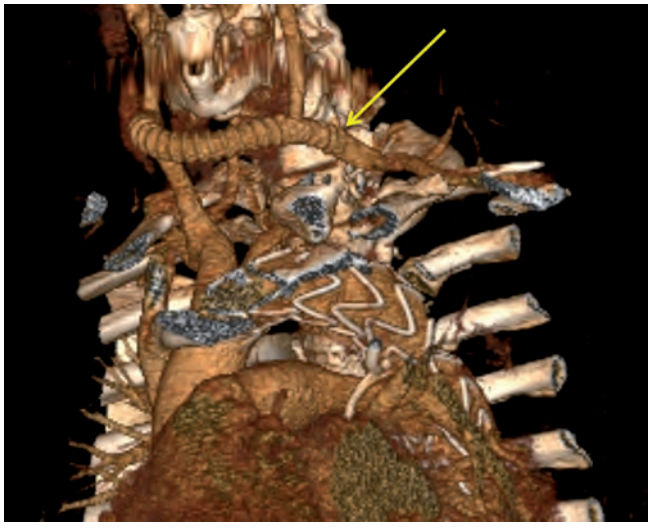

Figure 4.

aortic arch d=55 mm with local dissection with spreading to the left subclavian artery. Computer tomography (CT)-angiography: aortic arch aneurysm with maximum diameter 49 mm that began to the left common carotid artery and involved the origin of the left subclavian artery (d=28 mm), with type B dissection in this area (Fig.2.). Just distally to the left subclavian artery was local narrow (coarctation of the aorta) (Fig.1). 1 step - extra-anatomic bypass - left-right carotid and left subclavian-carotid arteries synthetic graft bypass for increase proximal landing zone. 2 step - thoracic endovascular aortic repair (TEVAR) (Fig. 3). After procedure - optimal result, without any endoleaks. On the 7th day after hybrid procedure the patient was discharged in a stabilized condition. This case report represents that hybrid repair of acute aortic arch aneurysm is safe and less invasive procedure and may be an alternative to standard open procedures. It also requires fewer in-hospital days.

00286

Early experience with the Nellix endovascular aneurysm sealing device: a preliminary comparative study

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BACKGROUND: Endovascular abdominal aortic aneurysm repair (EVAR) has supplanted open repair. Endoleak and graft migration are the Achilles' heel of endovascular treatment, requiring in specific cases secondary intervention or conversion to open repair. The Nellix Endo-Vascular Aneurysm Sealing (EVAS) System is a novel approach to abdominal aortic aneurysm (AAA) endovascular repair with encouraging results. The aim of this study is to assess the preliminary results of the Nellix endovascular device and compare them with those obtained in patients treated with a well-established endograft of the same material and also infrarenal fixation as the Gore Excluder.
METHODS: A retrospective analysis of prospectively collected data from two tertiary university centers from September 2014 to December 2017 identified 42 elective abdominal aortic aneurysm (AAA) patients treated with the Nellix device, in comparison to a matched group of 42 patients treated with the Excluder stent-graft. Endpoints included technical and clinical success, freedom from any secondary intervention, any type of endoleak and aneurysm related death. Each aneurysm was assessed for compliance with the instructions for use (IFU) of Nellix and Gore Excluder.
RESULTS: Primary technical success was achieved in all patients and no 30-day device related complications or deaths were occurred. Radiation burden (p=0.04) and contrast media (p=0.002) were significantly lower in patients in the Nellix group when compared to the Excluder group. The two groups were similar in terms of duration of the procedure, post implantation syndrome and in-hospital stay. During a median follow-up period of 14 months (range 1-26 months) there were no differences in clinical success, freedom from reintervention and aneurysm related death. No type I endoleak was observed in either group. There were 5 type II endoleaks in the Excluder group that spontaneously resolved during follow-up. Endoleak type II was not present in either of the Nellix group patients. One patient of the Nellix group suffered from type Ib endoleak from both sides and was treated successfully with endograft extension to both external iliac arteries at the 6th and 9th post-operative month.
CONCLUSIONS: The Nellix device is designed to overcome endovascular treatment's vulnerability points. The early experience with the Nellix stent graft system of two tertiary university centers is promising, with successful aneurysm sealing and good short-term results, comparing to a well-established endograft with infrarenal fixation, as the Gore Excluder. Long term follow-up is in progress. Despite the encouraging results, further and larger studies are needed to fully evaluate the short as well as the long-term results in comparison to other endografts.

00260

Penetrating aortic ulceration in chest

M. Szostek [1], W. Jakuczun [2], S. Toutounchi [1], G. Szostek [3], E. Krajewska [1], R. Pogorzelski [1], M. Szostek [1]

[1]Department of General Surgery, Medical University of Warsaw, Warsaw, Poland; [2]Department of General and Endocrinology Surgery, Medical University of Warsaw, Warsaw, Poland; [3]Department of General Vascular Surgery and Transplantation, Medical University of Warsaw, Warsaw, Poland

BACKGROUND: The aim of this study is to present results of endovascular treatment of penetrating aortic ulceration (PAU) in thoracic aorta. PAU might be symptomatic with acute pain in chest radiating to back, very similar to the pain accompanying heart attack. In majority cases is localised in the thoracic aorta isthmus just below the origin of left subclavian artery. In classical angiography or in computed tomography is hard to distinguish from aneurysm of ductus arteriosus Botalli or true aneurysm of the aortic arch. Left untreated, in high rate provide to rupture of aorta with massive bleeding.

METHODS: In our dept. 7 patients presenting PAU were treated. Between them were 4 men and 3 women. In two cases patients were admitted with already ruptured PAU with massive bleeding to the left pleural cavity. Two patients at the admission presented symptoms of pulmonary embolism. According to the ASA classification two patients were ASA 2, two patients with ruptured PAU were classified as ASA 5, two ASA 3 and one ASA 4. Between concomitant disorders: 4 patients had history of hypertension, two - coronary heart disease. All patient had computed tomography with contrast to localise ulceration site in the aorta and to check the morphology of the aortic wall. In 4 cases PAU was localised in the aortic isthmus, in 3 cases in distal thoracic aorta. The indication for further treatment was established according to the angio-CT. In our opinion at least 5 mm healthy neck, proximal as well as distal, is necessary for proper stent-graft sealing. 2-3 hours before operation width-spectrum antibiotic was given in a prophylactic dosage, usually cephalosporin 2 generation. All operations were performed in the operating theatre under fluoroscopic guidance. Three patients were operated under local anaesthesia, 4 under spinal. In all cases stent-graft was introduced through right common femoral artery exposed surgically. After angiography but before placement stent-graft, heparin was given in the standard dose 3 000 units. Due to localisation of ulceration in the aortic isthmus just below left subclavian artery, in one case left subclavian artery was overstented without prior transposition, in three cases stent-graft was placed below left subclavian artery, in 3 cases due to very low localisation of ulceration, in distal thoracic aorta. Because of such localisation, these three patients were operated with cerebro-spinal fluid drainage to avoid neurological complication. In post-operative period patients were on low molecular heparin and discharged from the hospital on aspirin.
RESULTS: All patients were operated with 100% technical success. One patient complained on fever lasting 3 days related to aneurysmal sac thrombosis, and was not related to any infection. In early as well as in long-term follow-up no complications were observed. CT-scan performed every six months in first two years and then every year, revealed good positioning of stent-graft with no sign of endoleak. In one patient growing abdominal aortic aneurysm was observed and he was operated endovascular two years after primary operation in the chest.
CONCLUSIONS: 1. PAU is rather rare disorder affecting thoracic aorta. 2. Untreated might provide to rupture with massive bleeding. 3. Endovascular procedure seems to be good option with low risk of complication.

00307

Pressure monitorization assisted surgical banding for hemodialysis access-induced distal ischemia

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BACKGROUND: The incidence of new end-stage renal disease cases has plateaued over the past decade. However, its prevalence continues to increase. Dialysis access-induced ischemia syndrome, also known as steal syndrome, is rarely seen in hemodialysis patients. However, this is a serious problem and may lead to some clinical findings like ischemic neuropathy, resting pain, and ulceration or tissue necrosis of fingers that may cause amputation. It is usually seen in two forms (ischemic steal syndrome and pathologic high flow) clinically. The treatment of these conditions is complex and varied, requiring many surgical revisions to correct symptoms. We used the banding technique under brachial and radial artery pressure control for surgical revision of high-velocity fistulaes.
METHODS: We included 28 patients (15 were female and 13 were male, average age 67) operated between January 2013 and January 2017 with banding by a polytetrafluoroethylene graft combined with pressure measurement from brachial artery and radial artery. Also, sterile Doppler ultrasound probe were used for measurement of arteriovenous fistula flow. Patients were followed up regularly in our outpatient clinic after the surgery. All of the patients were diagnosed by clinical examination and color flow Doppler ultrasound evaluation.
RESULTS: We performed 30 procedures in 28 patients. Indications for surgery were ischemic steal syndrome in 21 and pathologic high flow in 7 patients. Sixty-one percent of patients had a history of diabetes and fourty-three percent had a history of atherosclerotic disease. Mean time to intervention from creation was 36 months (range, 8-76 months). 3 (11%) patients complained pain during hemodialysis at first month controls; therefore, reintervention was performed. Thrombosis occurred in one patient after reintervention. No early or late complications were detected in other patients in six months. Patency rates at 6 and 12 months were 89% and 86%, respectively. There was no hospital mortality in our study.
CONCLUSIONS: Creation of arteriovenous access develops a pathway with low resistance. Physiological stealing develops in about 90% of the new access creations by bypassing the limb capillaries of high resistance, As access matures, access resistance continues to decrease and symptoms of ischemic steal syndrome may occur months later, or even years later, when access is established. Banding is efficacious and long-lasting treatment method of high-velocity arteriovenous fistulas and ischemic steal syndrome. We obtained satisfactory results with pressure monitorization assisted banding in hemodialysis access induced distal ischemia patients. Patient selection is key for alleviating the ischemic symptoms and maintaining use of the access.

00334

Effects of botulinum toxin A and papaverine in preventing spasm of human saphenous vein and internal mammary artery grafts: an *in vitro* study

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BACKGROUND: Autologous saphenous vein (SV) and internal mammary artery (IMA) grafting is broadly used as bypass conduits during coronary artery bypass graft (CABG) surgery. Vasospasm of the grafts is a major clinical problem and refractory spasm can be lethal. This in-vitro study was designed to assess the effectiveness of botulinum toxin A (BTX-A) and papaverine, in the inhibition of smooth muscle contraction in human SV and IMA and the changes over time.

Figure 1: Effect of BTX-A and papaverine on 5HT and ET-1 induced contractions

Incubation agent	Constrictor agent	SV (%)		IMA (%)	
		0 hour	2nd hour	0 hour	2nd hour
BTX-A (10^{-8}M)	5HT 10^{-6}M	95.71±20.41	81.29±15.31*ψ	79.14±10.99*	77.43±10.26*
	5HT 10^{-5}M	123.43±17.90*	107.71±11.54*ψ	93.00±4.86*	87.57±5.50*
	ET-1 10^{-10}M	34.25±14.11	29.50±10.02*ψ	70.63±9.73*	66.88±11.15*ψ
	ET-1 10^{-9}M	40.75±12.83*	37.50±12.41*ψ	80.88±9.20*	79.50±9.11*
BTX-A (10^{-6}M)	5HT 10^{-6}M	76.43±12.12*	57.14±10.10*ψ	70.43±10.19*	64.57±11.74*
	5HT 10^{-5}M	99.57±11.20*	81.43±9.99*ψ	85.29±5.67*	75.43±10.98*ψ
	ET-1 10^{-10}M	21.75±5.31*	18.38±3.02*ψ	56.00±6.71*	55.13±6.19*ψ
	ET-1 10^{-9}M	27.00±5.58*	23.88±3.48*ψ	66.13±5.35*	62.75±4.92*ψ
Pap (10^{-6}M)	5HT 10^{-6}M	74.57±18.93*	83.57±12.68*	84.86±4.37*	89.57±4.50ψ
	5HT 10^{-5}M	103.00±9.38*	117.43±11.97*	93.00±4.50*	99.14±3.43*ψ
	ET-1 10^{-10}M	43.29±9.75	53.57±7.04ψ	76.14±4.52*	82.14±3.67ψ
	ET-1 10^{-9}M	55.43±7.30*	67.43±7.78ψ	82.86±3.53*	90.00±4.39*ψ
Pap (10^{-4}M)	5HT 10^{-6}M	21.14±0.11*	49.14±8.27*ψ	61.75±6.27*	74.38±8.45*ψ
	5HT 10^{-5}M	29.71±13.75*	61.29±25.99*ψ	70.00±7.07*	89.25±6.27*ψ
	ET-1 10^{-10}M	34.43±6.21*	44.43±8.14ψ	63.43±9.71*	71.86±7.71*ψ
	ET-1 10^{-9}M	39.43±4.75*	50.86±5.46*ψ	69.29±7.06*	79.57±3.56*ψ

-Results are % of KCL induced contractions.
-Control contractions elicited by 10^{-6}M 5 HT:101.63±1.99%, 10^{-6}M 5HT:139.25±26.4%, and 10^{-10}M ET-1:48.25±13.81%, 10^{-6}M ET-1:67.88±11.65% (SV).
-Control contractions elicited by 10^{-6}M 5 HT:93.29±4,53%, 10^{-6}M 5HT:107.43±6.02 %, and 10^{-10}M ET-1:82.86±4.18%, 10^{-6}M ET-1:97.43±3.50% (IMA) .
-*p<0.05 compared to control of each constrictor agent. ψp<0.05 compared to 0 hour.

METHODS: After Ethics Committee approval, otherwise discarded SV and IMA segments were obtained from patients undergoing CABG. Vessel segments were cut into rings of 2-3mm width and suspended in a 10ml organ bath containing Krebs-Henseleit-Solution. Isometric contraction responses were recorded by using a transducer. Control contractions of both vessel rings were obtained with 80mM KCL. Each experiment was conducted on different rings. (n=7, 8 for each experiment group). SV or IMA rings were first incubated for 40min with either (10-6 or 10-8 M) BTX-A or (10-4 or 10-6 M) papaverine. Then 5-HT (10-8 – 10-6 M) or ET-1 (10-10 – 10-8 M) was added to the organ bath and dose-response curves were obtained at two time intervals (0 and 2nd hour). Histopathology of the rings was examined for tissue integrity. Dose-response results for each concentration of the constrictor agent (5-HT and ET-1) was evaluated as the % of control contraction responses elicited by KCl. Data are mean±SD for continuous variables. Shapiro-Wilk and Student's t test were used. $p<0.05$ = significant.
RESULTS: BTX-A was effective in attenuating the constriction elicited by 5HT and ET-1 in a concentration dependent manner in both SV and IMA rings with a longer duration of action compared to papaverine. In SV, incubation with 10-6 M BTX-A significantly inhibited the constriction elicited by both contraction agents at 0 and 2nd hours. Lower concentration of BTX-A (10-8 M) significantly inhibited the constriction of higher concentrations of the agents at 0 hour while inhibited all groups at the 2nd hour. In IMA, both concentrations of BTX-A significantly inhibited the constriction in all contraction agent groups at 0 and 2nd hours. The inhibition by BTX-A observed in all groups did not decrease by time, on the contrary increased in some groups. Significant inhibition observed with higher dose of papaverine (10-4 M) on the constriction elicited by the contraction agents at 0 hour decreased by time (Figure 1).
CONCLUSIONS: This study for the first time shows that (1) incubation with BTX-A effectively relaxes both IMA and SV rings contracted with 5HT and ET-1 (2) Duration of the relaxant effect of BTX-A is longer than papaverine. This inhibition showed difference according to the vasoconstrictor agent, dose and vessel and contrary to papaverine, did not decrease with time. No vascular damage was observed with BTX-A. BTX-A may be considered as an alternative topical agent to prevent graft spasm in patients undergoing CABG. Further studies are warranted.

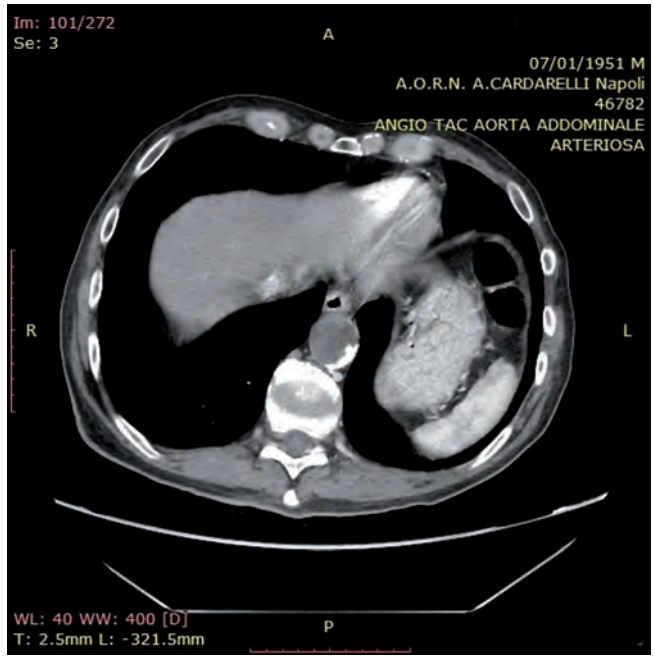

Figure 1.

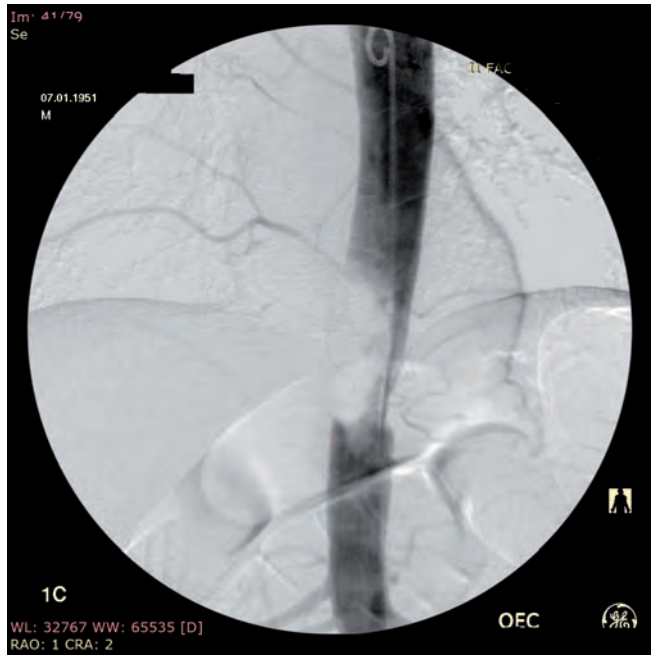

Figure 2.

00370

Endovascular surgery for treatment of paraneoplastic obstruction of the descending thoracic aorta

E. Di Tommaso, L. Di Tommaso, G. Comentale, F. Scigliano, G. Iannelli

Department of Cardiac Surgery, Medical School, University of Naples "Federico II", Naples, Italy

BACKGROUND: Thoracic endovascular aortic repair (TEVAR) is currently used in the treatment of aneurysm exclusion of the descending thoracic aorta, acute and chronic complicated type B aortic dissection and traumatic or iatrogenic ruptures as well as in peripheral occlusive disease. Rarely covered endovascular stent-grafts had been implanted in the thoracic aorta to perform the resection of the aortic wall infiltrated by a intrathoracic tumors. To our knowledge this we describe is the first clinical case of a critical paraneoplastic stenosis of descending thoracic aorta treated with TEVAR.
CASE REPORT: Three months ago a 61 years-old man, with an unknown history of tumor, was transferred from a local hospital and admitted in emergency to our department with a diagnosis of critical stenosis of the descending thoracic aorta and visceral-organ and lower-limb malperfusion. The contrast enhanced computer tomography (CT scan) showed a voluminous mass infiltrating and occluding the descending thoracic aorta far from left subclavian artery and celiac axis, extending for 80 mm (Figure 1). Moreover the CT scan showed a voluminous retroperitoneal mass. A subsequent percutaneous biopsy performed after stent graft implantation, allowed to diagnose a retroperitoneal high grade undifferentiated pleomorphic sarcoma. The endovascular stent graft procedure was performed under general anesthesia in our hybrid operating room. Patient was administered 5.000 IU of unfractionated heparin intravenously before insertion of the catheters. Angiography was performed with a pigtail catheter introduced from the left femoral artery (Figure 2). Femoral access was achieved by surgical dissection of the right common femoral artery. Over a Back-up Meier wire and under fluoroscopy, a Medtronic Valiant stent-graft was placed in the optimal position far from the celiac artery. To completely cover the stenotic tract the patient required one stent-grafts. The device was oversized by 10 % compared to the normal aorta of the landing zone. Subsequent aortography confirmed the adequacy of the treatment and the absence of endoleaks or bleeding from the aortic wall (Figure 3). After stent-graft release the paraneoplastic thrombus, mobilised from the descending aorta to the carrefour, was removed with a Fogarty catheter introduced thorough left and right femoral arteries. The postoperative period was uneventful. The patient was discharged

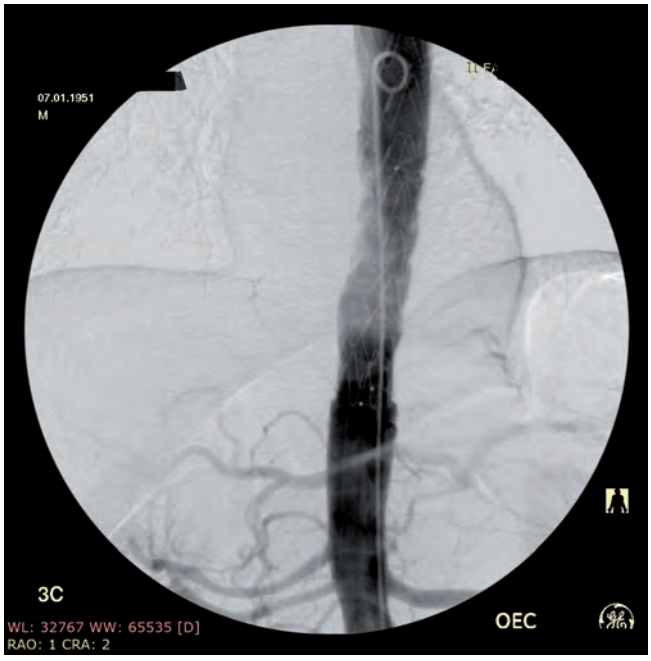

Figure 3.

from the hospital within four days. Follow-up CT scan were performed at one month and showed complete patency of the descending thoracic aorta. At 3 months follow-up the patient, treated with chemotherapeutic agents, is asymptomatic for aortic related disease Our good results for treatment of uncommon thoracic aortic diseases and encouraging experience for treatment of this patient indicate that endovascular surgery is a useful and less invasive alternative to open surgical operation for these uncommon disease too.

SESSION: VASCULAR ABSTRACT SESSION II

TIME: 16:30-17:00

ROOM 3: STRASBOURG

00125

Endovascular treatment of type 1a endoleak, with multilayer flow modulator (MFM)

E. Karaagac [1], Y. Gokkurt [1], I. Peker [2], I. Yurekli [1], H. Cakir [1], A. Gürbüz [1]

[1]Izmir Katip Celebi University Ataturk Training and Research Hospital Department of Cardiovascular Surgery, Izmir, Turkey; [2]Mardin State Hospital, Mardin, Turkey

BACKGROUND: One of the most common late complications in EVAR operations are endoleaks.Sometimes endoleaks may have an inadequate proximal neck. Coated stent is not adequate for endoleak surgery in such patients (juxtarenal level) .The point of using MFM graft is to keep the visseral arteries flow.In this case report, we presented our endovascular treatment with MFM in a patient who had type 1a-1b endoleak

CASE REPORT: A 71-year-old male patient was admitted to the emergency department with abdominal pain. A bifurcated endovascular graft was placed due to abdominal aortic aneurysm eight years ago at another hospital.CT angiography revealed a type 1a endoleak originating from both renal arteries and a type 1b endoleak distal to the left iliac lengthening graft.(figure1-2)Because of comorbid factors such as COPD, diabetes mellitus and morbid obesity, primally endovascular treatment was planned for the patient. Aortabifemoral by-pass and visceral debranching were planned as secondary treatment methods when the present co-morbidity factors were considered. The patient's CT angiography images were evaluated in 3-D in

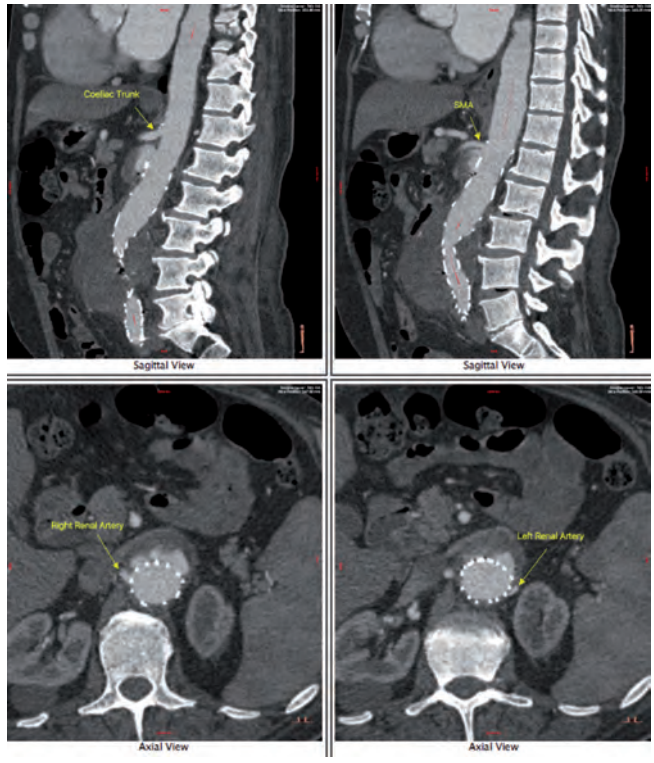

Figure 1.

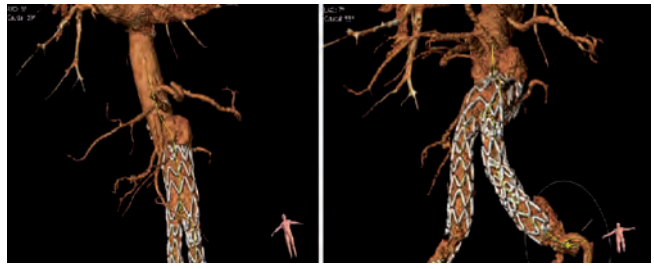
Figure 2.

order to make appropriate graft selection in preoperative period. We planned to place a MFM for type 1a endoleak and an iliac lengthening graft for type 1b endoleak. The patient was operated under general anesthesia with intratrecale. Following 7500 unit heparinization, angiography was performed with a 7f sheath placed in common femoral artery. The MFM was placed for type 1a endoleak with 3 cm overlap into the old bifurcated endovascular graft. As expected in angiography, endoleak was present at the level of juxtarenal. (figure3)Iliac lengthening endovascular graft was placed for type 1b endoleak with 8 cm overlap into the old endovascular graft. Control angiography showed minimal endoleak in late phase and it was not intervened. (figure4)Arteriotomy was repaired and left femoral region was sutured after bleeding control. The patient was taken intensive care and extubated after 6 hours. Dual antiagregan treatment (Clopidrogel, ASA) was medicated during the first month after the operation. After the first month, the treatment was continued with ASA only. The patient was discharged on the third postoperative day. The patient was discharged in order to come to examine by CT angiography after three months on the third postoperative day. It is known that the endovascular grafts operating with the multilayer flow modulator principle do not close the endoleak immediately but turn the turbulent flow into laminar flow. But after months, the aneurysm around the stent is thrombosed due to laminar flow. Within appropriate indications, endovascular surgery is primary treatment

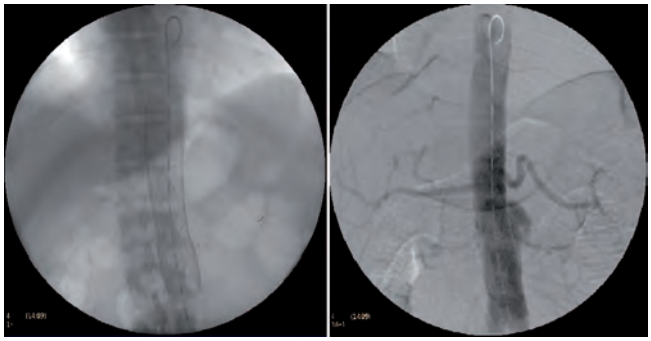

Figure 3.

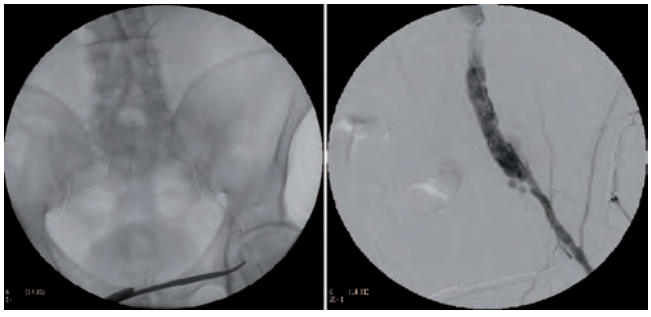

Figure 4.

in patients with high comorbid factors.

00250

Continuous renal replacement therapy before thoracic endovascular aortic aneurysm repair in a polytrauma patient with Stanford B dissection

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BACKGROUND: The compounding effect of multiple injuries resulting from car accidents negatively affects the prognosis of polytrauma patients. Acute aortic dissection is an often lethal condition; 80% of patients with a traumatic aortic injury succumb at the crash scene. Stanford B dissections are particularly challenging; Trans Endovascular Aortic Repair (TEVAR) is a non-invasive treatment alternative to manage Stanford B dissection when conventional open surgery is contraindicated. In the Republic of Macedonia, TEVAR stents require 24 – 72 hours for delivery; as a result, risks of additional complications in the polytraumatized patient are increased. Rhabdomyolysis is a condition characterised by musculoskeletal tissue damage and subsequent release of (intra-)cellular debris in the circulatory system. Acute Kidney Injury (AKI) is a common consequence of Rhabdomyolysis as the sudden clearance of large amounts of necrotic waste decreases renal perfusion. AKI is a severe complication with a significant prevalence and high mortality rate. This case report demonstrates the importance of early recognition and treatment of AKI, using continuous venovenous hemodiafiltration, in polytrauma patients in preparation for TEVAR.
CASE REPORT: We admitted a 63-year-old male COPD patient in a severe, life-threatening condition to our emergency unit following a car accident. He was somnolent, dyspneic, cyanotic and with low peripheral oxygen saturation (SpO2 < 90%). Multislice computed tomography (MSCT) scans revealed a traumatic 50 mm dissection, and surrounding hematoma, of the descending aorta, originating 25 mm from the output of the left subclavian artery present. We also observed a pleural effusion with compressive atelectasis in the left hemithorax and a fracture of the 10th thoracic vertebra, a serial fracture on the left ribs left and the iliac bone and a bilateral ramus superior to the pubic bone. Given the high risks for perioperative complications we concluded that a non-invasive intervention, Thoracic Endovascular Aortic Repair (TEVAR) was best indicated. The waiting time for personalised TEVAR stents is 24 □ 72 h in the Republic of Macedonia. Unfortunately, the patient became febrile (38ºC) in the following 12 □ 36 h and developed a reduced diuretic response, anuria accompanied by worsening dyspnea resulting in a SpO2 of 85% despite continuous diuretic stimulation and ventilation support. Blood samples were collected for biochemical and microbiological analyses; C-Reactive Protein 129 mg/L, Procalcitonin 5,23 ng/ml, N-acetyl-cysteine-activated creatine kinase (CK-NAC) 5334 U/L; creatine kinase-muscle/brain (CK-MB) 119 ng/mL, D-dimers 21650 ng/mL, Creatinine 94,8 mmol/L and Urea 7,1 mmol/L. The examinations and results strongly suggested rhabdomyolysis with progressive acute renal failure and deep vein thrombosis. In an attempt to reverse the deteriorating health condition we placed the patient on a continuous venovenous hemodiafiltration (CVVHDF) using the Prismaflex oXiris filter combined with Ciprofloxacin 400mg i.v. q8.h, which replaced the empiric Ceftriaxone 2 g i.v. q.24h regimen, to counter extended-spectrum beta-lactamase-positive Escherichia coli detected in sputum samples; hemocultures were negative. TEVAR was performed on day 2 with the patient still on CVVHDF. The continuous respiratory support improved the SpO2 to 92% and the therapy decreased CK-NAC, CK-MB and D-dimers to 1,17 ng/mL 1338U/L, and 3900 ng/Ml, respectively; we terminated CVVHDF after 48 h. No significant post-procedural complications were observed. We discharged the patient in good condition after a total of 11 days under our care.
CONCLUSIONS: In conclusion, Rhabdomyolysis and AKI are severe complications in polytrauma patients; prompt recognition and treatment are imperative for optimal recovery. The use of CVVHDF prevents renal deterioration. CVVHDF is a valued rescue practice for Rhabdomyolysis, and AKI, as it provides excellent patient stabilisation before a TEVAR procedure.

00276

Endovascular repair of giant descending aorta aneurysm: a case report

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BACKGROUND: Aortic aneurysms often combine with multisite artery disease. It is a challenge problem to determine the optimal way of treatment. Multidisciplinary approach is obligated. We present our experience of immediate endovascular giant thoracoabdominal aneurysm repair with simultaneous iliac artery stenting in patient with coronary artery disease.
CASE REPORT: A 59-year-old woman (social history: married with 2 children) with intermittence claudication observed in 2014. There was contrast fluid delay in the diaphragm area. Aortic aneurysm was suspected. Giant thoracoabdominal aneurysm from distal part of descending aorta till celiac trunk diagnosed. Max size of aneurysm was 105*94 mm. Patient suffered from congestive heart failure (CHF), chest pain, that significantly limited the physical activity and life quality became worse. Surgery (open aneurysm repair) was indicated in the regional hospital, but patient refused. During two years there were no examinations. In December 2016 patient complained about hypertension, permanent lumbago, chest pain. She was admitted to the department in a few days. After survey three-vessel coronary disease: left anterior descending artery 70 %, right coronary artery 65 %, circumflex artery 70 %. On the CT-angiiogrphy aneurysm size increase till 115*112 mm, iliac arteries lesions (left external iliac stenosis 80%), celiac trunk occlusion diagnosed. According to the echocardiography data ejection fraction was 65 %, no a- and hypokinesia zones of myocardium. Coronary artery bypass grafting (CABG) was indicated. Patient was discussed with “herat-team”, there was little time to make a decision. Due to very high risk of aneurysm rupture, patient’s age, normal ejection fraction, no significant comorbidity except coronay artrey disease, the thoracic endovascular aortic repair (TEVAR) was chosen the first stage. There was no opportunity to pass the destination system due to expressed tortousity of right iliac artery. Through the left femoral approach critical

left external iliac artery stenosis was stenting before graft implantation. Endograft was inserted and placed from Th_{VI} down to superior mesenteric artery. There was no endoleaks and aneurysmal sac extension on postprocedural computered tomography (CT)-angiography of the aorta. Postoperative period was uneventful. On the 6th day after procedure patient was discharged in a stabilized condition for ambulatory care. In a few days CABG carried out. Postoperative period was uneventful too. This case report represents that multidisciplinary approach is obligated to determine the optimal treatment in patients with aneurysmal disease, multisite artery disease. Endovascular aortic aneurysm repair may be an alternative procedure in high risk patients with good results.

00249

Reconstruction of right tibial anterior artery after external skeletal fixation for tibial bone fracture: case report

R. Aščerić [1], S. Sekulić [1], Z. Stefanović [1], M. Popović [1], J. Adam [1], M. Lazovic [1], Ilijevski [2, 3]

[1]Department of Vascular Surgery, Clinic of Surgery, Clinical Hospital Centre Zvezdara, Belgrade, Serbia; [2]Vascular Surgery Clinic, Dedinje Cardiovascular Institute, Belgrade, Serbia; [3]Medical Faculty, University of Belgrade, Serbia

BACKGROUND: Fractures of the lower leg or of the tibia itself are among the most common fractures of long bone diaphysis. Open fractures of the lower leg, but also many closed ones as well, may present difficult therapeutic problems. There are different methods of inoperative and operative treatment of lower leg fractures. Operative treatment involves the application of external methods (skeletal) and internal fixation (intramedullary or fixed compression plates). External skeletal fixation is the method of choice for open leg fracture treatment as well as for most unstable closed fractures of the lower leg. It's a simple and effective method with a low complication rate.
CASE REPORT: A female patient, age 42, attended her regular monthly orthopedical check-up after she had undergone an external skeletal fixation for a right tibial bone fracture. After routine unscrewing with the intended purpose to mobilize the foot, abnormal bleeding occurred in her lower leg area next to the bottom screw. Because of the large amount of blood loss and an unsuccessful ambulatory haemostasis attempt, urgent surgery was required. The patient was admitted to the operating room in the following condition: tachycardia 100/min, hypotension 90/60mm Hg, with 2.8 x 10/L eritrocytes and hemoglobin 8,2 gr/L. Intraoperative findings showed that the arterial wall of the right tibial anterior artery was destroyed, which destruction covered more than half of the circumference (approximately 10mm in length) and had been caused by the external fixation screw. We performed hemostasis and reconstruction of the right tibial artery with left cephalic forearm vein interposition. We used left cephalic forearm vein because great saphenous vein was out of reach as a result of the external skeletal fixation presence. Both following the surgery and on discharge from the hospital, the patient was hemodynamically stable, normotensive, the vascular status was normal, with palpable pulses on dorsalis pedis and tibial posterior artery. The patient was released with prescribed daily therapy of 100 mg of Aspirin. Postoperative ankle brachial index (ABI) on dorsalis pedis and tibial posterior artery also had normal values of (ABI >1,1) on both legs, both on discharge and one month after on control as well. After discharge, the patient was referred to physical rehabilitation.

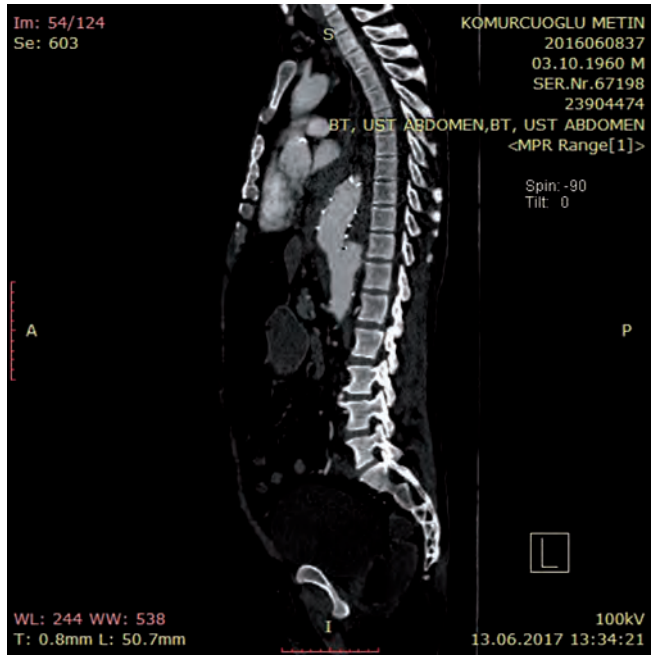

Figure 1.

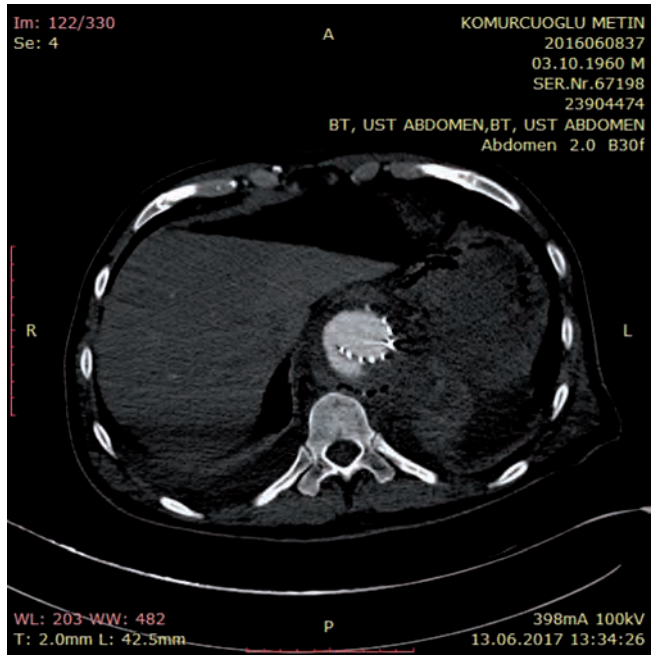

Figure 2.

00103

Endovascular approach to ruptured thoracic aortic aneurysm

E. Karaagac [1], Y. Gokkurt [1], H. Durmaz [1], N.U. Tunca [1], G. Erbil [2], I. Yurekli [2], A. Gürbüz [2]

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BACKGROUND: Thoracic Endovascular Aortic Replacement (TEVAR) is the preferred method of treatment compared with conventional aortic surgery when evaluated in terms of mortality-morbidity rates in desenden aortic aneurysms. Ruptures, endoleaks and expanded descending aortic aneurysms that occurred following TEVAR can be interfered with aortic lengthening grafts. Rarely, conventional aortic surgery can be performed. This patients experience impairment of general condition and hemodynamic instability. Emergency TEVAR in these patients is life-saving.
CASE REPORT: In this case report, we talked about a patient who undergone a TEVAR operation previously. Patient applied to the emergency service with hematemesis and the patient was hemodynamically instable. As a result of rupture seen in CT angiography, he underwent an emergency TEVAR operation. Patient was a

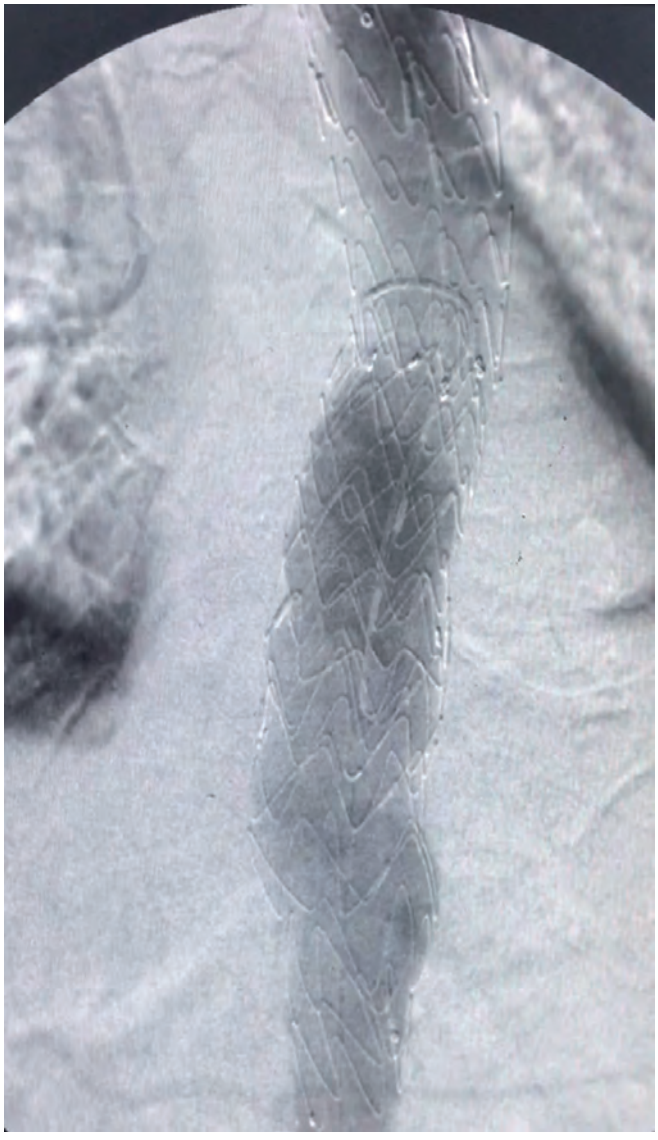

Figure 3.

56-year-old male patient who underwent TEVAR operation 2 years ago due to desenden aortic aneurysm, presented to emergency department with hematemesis, patient was hemodynamically instable. Because of rupture in CT angiography and hemodynamic instability of the patient, emergency TEVAR operation was performed. (figure1-2) Hb:4.1 mg/dl, Hct:13%, BP:50/30 mmHg, HR:146 BPM were patients values before he went under the surgery. Medtronic Captivia 40x40x250 mm aortic lengthening graft was replaced to the Celiac Trunk via 7F sheat, directed from the right Common Femoral Artery (CFA), under intratracheal general anesthesia with high dose positive inotropic support and blood product replacement. There was no endoleak in the control angiography of the patient who had peroperatively positive inotropic support and blood product transfusion requirement decresed after TEVAR rapidly. (figure 3-4) Patient was taken to the Intensive Care Unit after a successful operation. High-dose positive inotropic support was discontinued and patient was extubated after 18 hours postoperatively, and the patient was discharged with cure. We can see that TEVAR is a life-saving treatment method in a patient whose hemodynamically instable after an rupture of the descending aorta and which is taken to the emergency

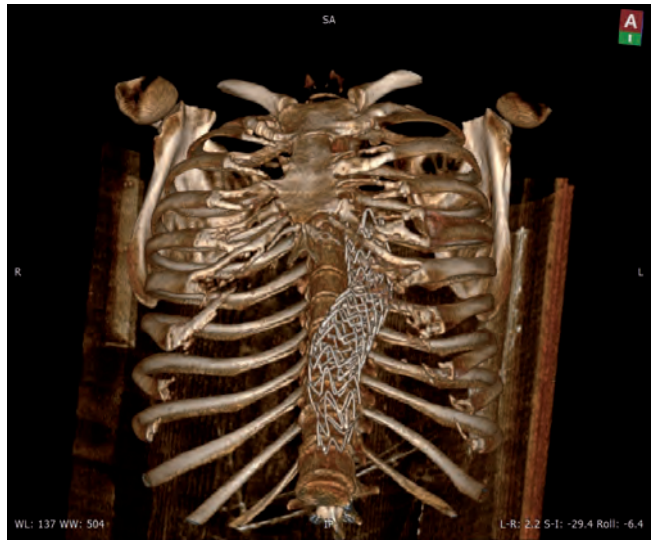

Figure 4.

operation. However, the choice of appropriate endovascular graft is still the most important issue about patients who is going under TEVAR operation. In terms of possible complications of these patients, close follow-up with CT angiography is required in the postoperative period. Considering patient comfort in the postoperative period, short duration intensive care follow-up, and hospital stay, we note that new technologies are expected to be of interest for wider use of aortic emergency endovascular procedures, especially for convalescent surgical and endovascular interventions by sharing experiences of cardiovascular surgeons.

00289

Hybrid approach in an aortic arch aneurysm and ischemic cardiomyopathy

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BACKGROUND: The management of aortic arch aneurysms remains a clinical challenge. Open total arch procedures can be accomplished using complex circulatory management and adjunct cerebral protection, but subgroups with multiple comorbidities may still experience significant morbidity and mortality from both neurologic and cardiovascular complications. In these high-risk patients alternative therapies are sought. The “hybrid” aortic arch repair, with debranching and reimplantation, or with bypass of aortic arch vessels and endoprosthesis of the aortic arch, is evolving toward a front-line treatment option for complicated pathologic conditions of the aortic arch, especially in patients with a severe comorbid status.
CASE REPORT: We present a 73-year-old man with history of hypertension, former smoker, hypercholesterolemia, chronic obstructive pulmonary disease and restrictive pulmonary disease (pachypleuritis). He came to our Hospital due to the exacerbation of his respiratory symtoms and dysphonia. A CT scan and IMR were performed and he was diagnosed with and aortic arch aneurysm (8.2 cm) which extended from the brachiocephalic artery to the beginning of the descending thoracic aorta, including the left subclavian artery. This aneurysm was associated with an intramural hematoma (1.2 cm) of the aortic arch. Due to the comorbidity of the patient to carry out an open aortic arch replacement surgery, we decided to perform

a hybrid aortic arch repair with bypass of aortic arch vessels and stenting of the aortic arch. Prior to surgery, an echocardiogram and coronary angiography and aortography were requested. An obstruction of the right coronary artery was observed. The procedure was carried out in two stages. Fistly, sternotomy with cardiopulmonary bypass and cardiac arrest was performed. During this procedure, a right coronary artery bypass with saphenous vein was made. In addition, an extraanatomic bypass with a 16mm Dacron tube graft from the ascending aorta to the innominate artery was inserted. Anohter Dacron tube graft (8mm) was inserted from the previous one to the left common carotid artery. Both arteries (innominate and left common carotid artery) were excluded from the aortic arch. Subsequently, 5 days later, the second phase of the procedure was performed, inserting two endoprosthesis (GoreTag 45x45x200mm and GoreTag 45x45x100mm) through the left femoral artery and covering the aortic arch and proximal portion of the descending thoracic aorta (Z0-Z4 aorta zones). During the same procedure the pre-vertebral segment of the left subclavian artery was occluded with an "Amplatzer Vascular Plug". As a complication after performing the second procedure, the patient presented a spinal cord ischemia with a hemiplegia of the lower extremities which was completely resolved with the placement of a drainage of the spinal fluid. The drainage was removed three days after normalization of the cerebrospinal fluid pressure. The patient progressed satisfactorily and was discharged from hospital without further complications.

SESSION: CARDIAC ABSTRACT SESSION II

TIME: 17:00-18:00

ROOM 3: STRASBOURG

00405

Aortic arch repair with Thoraflex© hybrid system: a mono-center experience

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BACKGROUND: We performed 9 aortic arch repair with the Thoraflex© hybrid system in our cardiac surgery center of Nancy, France. We present here the results of this procedure after analyzing this risky procedure in cardiac surgery in terms of cross clamp time, circulatory arrest, bleedings and post-operative complications.
METHODS: From June 2016 to December 2017, 9 consecutives procedures of aortic arch repair with the Thoraflex© hybrid system were analyzed after recording the preoperative and postoperative datas. We also recorded the operative datas such as cardiopulmonary bypass (CPB) time, cross clamp time, circulatory arrest time, and the peri-operative needs for transfusion (packed red blood cells, platelets, fibrinogen).
RESULTS: Mean age of the population was 67.67 ± 7.62 years with a mean logistic Euroscore of 39.76%. 4 procedures were performed for acute aortic type A dissection, 1 for chronic dissection and 6 patients had an aortic arch anevrysm (mean diameter 61.34 ± 18.04mm). 4 patients needed a combined procedure (1 AVR, 1 Bentall, 1 CABG, 1 Ascendant Aorta replacement). Mean cardiopulmonary bypass time, aortic cross-clamp time and circulatory arrest time perfusion time were 287.4 ± 70.80 , 163.1 ± 81.15 and 64.4 ± 26.51 min, respectively. Mean transfusion was 5.56 ± 3.78 units of packed red blood cells, 1.67 ± 1.00 units of platelets and 4.28 ± 2.68g of fibrinogen. In-hospital mortality was 22.2% (n = 2). Mean ICU stay was 19.84 ± 11.28 days. Only one patient came out from hospitalization with neurological peripheral deficiency. The most common complication was pulmonary infection found on 55.5% (n= 5) patients.
CONCLUSIONS: The Thoraflex© hybrid system provides good results with limited transfusion probably due to the collar on the distal anastomosis.

00080

Valve sparing operation

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BACKGROUND: Preservation of the aortic valve during aortic root surgery has emerged to a very popular technique. A wide range of surgical techniques is available and over time several modifications of each technique have been proposed. Aortic valve re-implantation is the most widely used technique to preserve the aortic valve. To many it is the therapy of choice especially in acute settings for example in acute aortic root dissection. The success of this operation primarily depends on preserving the geometry of the aortic root thus minimizing the mechanical stress and strain on the cusps. We reviewed a single surgeon experience with aortic valve re-implantation technique in a series of 22 consecutive patients after introducing a valve sparing program.
METHODS: From June 2010 to October 2017, 22 consecutive patients underwent a valve sparing root procedure with or without additional cusp repair. Both full sternotomy as well as minimal access approaches were performed. Operations have been performed either for aortic root aneurysm or acute aortic dissection. In all patients cold blood cardioplegia was administered. Patients were prospectively followed by means of transthoracic echocardiography and visits in our outpatient clinic.
RESULTS: A Vascutec Terumo Valsalva graft was used for re-implantation in all 22 patients. Mean age at surgery was 64,5 years (47-74). Follow up is complete up to six years with a mean follow up time of forty five months. No patient was lost to follow up. One patient died during follow up for non-cardiac cause. Overall survival at 1, 3, and 6 years was 100%, 100%, and 83%, respectively. One patient required re-operation for late recurrent aortic insufficiency after longer than four years. Freedom from valve related re-operation at 1, 3 and 6 years was 100%, 100% and 90%, respectively. Freedom from moderate to severe residual aortic insufficiency at 1, 3 and 6 years was 100%, 100% and 92%, respectively.
CONCLUSIONS: Introducing the re-implantation technique at our institution was successful without operative mortality. The use of the Valsalva graft in a standardized technique led to good valve configuration with long-term results comparable to experienced centers. In our initial experience re-implanted valves perform well after up to six years follow up. In our opinion it is important to master one technique rather than introducing different techniques at once. We chose a technique which could be performed both in elective as well as acute settings. In acute settings it is important to stabilize the root.

00219

Triangular plasty of left atrium for atriomegaly during mitral valve replacement

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BACKGROUND: To determined possibillities of left atrium (LA)`s reduction by original method of triangular plasty of LA (TPLA) during mitral valve replacement (MVR) for isolated mitral valve disease (MVD).
METHODS: During 2005 - 2015 yy. 705 adult patients (pts) with MVD and LA`s atriomegaly (diameter of LA > 60 mm) average 71,7 ± 1,8 were operated at National lnstitute of cardio-vascular surgery named after Amosov. MVR were performed in all patients. There were 310 (43,4%) males, 395 (56,6%) females. Average age was 51,5 ± 6,9 yy. There were 428 (60,7%) in IY NYHA class and 277 (39,3%) in III class. The main reason of MVD were: rheumatism (69%). Atrial fibrillation was marked in all pts. All data divided at 2 groups: group A - triangular plasty of left atrium (TPLA) + ligation of left atrium`s

auriculum was 128 patients and group B - 577 pts only mitral valve replacement (MVR) without LA`s plasty or ligation`s auriculum. All operations were performed with CPB, moderate hypothermia with crystalloid cardioplegia. Cross-clamping time of aorta (min) were: group A - 73,4 ± 8,6 and group B - 47,2 ± 4,9 (p< 0,05). Absence of using blood product in 41,5%.
RESULTS: The hospital mortality were: in group A - 1,6% (n=2/128) and in group B - 2,6% (n=15/577) (p<0,05). Sinus rhythm was restored at discharge: group A - 7,2% and group B - 1,7% (p<0,05). At the remote period (average was 7,2± 0,7 yy) 651 (93,5%) pts were followed-up. Data of echo for group A: diameter of LA (mm) - preoperative (PRE) - 71,4 ± 1,4, postoperative (POST) - 51,6 ± 0,8, remote period (RP) - 52,2 ± 0,7; ejection fraction of LV (EFLV): PRE - 0,52 ± 0,05, POST - 0,55 ± 0,04, RP - 0,58 ± 0,02 . Data of echo for group B were: diameter of LA (mm): PRE- 71,3 ± 1,5 , POST - 69,3 ± 1,8, RP - 78,1 ± 1,8; EFLV: PRE - 0,53 ± 0,04 , POST - 0,54 ± 0,05, RP - 0,47 ± 0,04 . At remote period thrombembolic events and heart failure were marked respectively: in group A -1,7% and 2,9% and in group B -7,5% and 27,2% (p<0,05). Sinus rhythm was marked in group A - 3,5% and in group B - 0,0% (p<0,05).
CONCLUSIONS: The original method of TPLA was allowing to improve better clinical results at group A than in B (p<0,05).

00233

Early extubation after heart surgery in new tertiary center: our experience

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BACKGROUND: Early extubation is defined as extubation within six hours following the end of surgery. With the advancement of anaesthesia, perfusion and surgical procedures, early extubation is being practiced in almost all cardiac centre of the world for its major benefit in reducing cost without compromising patient care. Studies have shown that early extubation of elective cardiac surgery patients does not increase periopera tive morbidity. In our study we used multidisciplinary protocols for early extubation in cardiac surgery patient selection, to ensure quality and effectiveness of care and its comparisons to delayed extubation. Objective of our study is a well-planned early extubation after cardiac surgery within six hours of intensive care unit stay with cooperation of the cardiac surgeon, cardiologist, anaesthesiologist, perfusionist and nursing staffs and its comparison to delayed extubation. The secondary objective of study is to reduce ventilator associated complications/ infections, early mobilization, less hospital stay.
METHODS: In our prospective study we used multidisciplinary protocols for early extubation after heart surgery of 89 patients from May 2016 to December 2016 in our new tertiary cardiac centre. The patients were divided into two groups: Group A, those extubated within six hours of surgery (n=68 cases); Group B, those not extubated after six hours, electively ventilated overnight (n=21 cases).
RESULTS: The patients were divided into two groups: Group A, those extubated within six hours of surgery (76.4% cases); Group B, those not extubated after six hours and electively ventilated overnight (23.5% cases). There was no significant difference in age, BSA, preoperative risk factors and left ventricular function in both groups, while female (71.4%) in group B had delayed extubation. Mean total CPB and cross clamp time in group B (187.14 & 139 minutes respectively) was higher than in group A (139.45 & 102.62 minutes respectively). In comparison of postoperative data we found that use of blood products, re-exploration for bleeding (19%) stay in ICU and step down was slightly higher in group B. High inotropic support (42.85%), deep coma (25%) were the two main factors for delayed extubation in our study. Hospital mortality was higher in group B (33.3%) than in group A (2.94%) patients
CONCLUSIONS: We can safely use early extubation in most of conventional cardiac surgical procedures, without additional cost, learning curve and compromising patient care. Despite advances in anaesthesia, we can safely use early extubation in most of conventional cardiac surgical procedures, without additional cost, learning curve and compromising patient care.

00203

Correction of narrow ostium of aorta during aortic valve replacement: choice of surgical method

V. Popov, K. Vakulenko
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BACKGROUND: Aim of this investigation is to research possibilities of different method of surgical correction during aortic valve replacement (AVR) in patents (pts) with narrow ostium of aorta (NOA).
METHODS: In analyzed group were included 165 pts with aortic valve disease (n = 142) and combined mitral-aortic diseases (n =23) with NOA wich were consecutive operated in Institute from 01.01. 1996 till 01.01.2017. There were 94 (57,2%) males and 71 (42,8%) females in average age 55,5+8,4 yy. 58 (35,2%) pts belonged to III NYHA class and 107 (64,8%) - to IV. AVR with reconstruction of ostium of aorta was performed in all cases by following methods: Konno`s operation (n=29) - group A, Nick`s operation (n=33) - group B, original method of reconstruction by posterior aortoplasty (Popov V.) (n=103) - group C. The following patches were used: Vascutek`s (n=69), autopericardial (n =71), bovine biocor SJM (n = 25). Only bileaflet prosthesis were used. Operations were performed in conditions of moderate hypothermia (27-32° C) and mainly with ante-retrograde crystalloid cardioplegia (mainly Custadiol).
RESULTS: Hospital mortality (HM) (30 days) were: group A of a pacients with pathologic aortic valve - 10,3% (n=3/29), group B - 9,1% (n=3/33), C - 6,8% (n=7/103) (p <0,05). At the last 21 operations in group C HM - 0%. Reasons of deaths: group A - all heart failure, group B - brain damage (n=1), bleeding (n=1), MOF (n=1), group C - pneumonia (n=2), acute colitis (n=1), sepsis (n=1), MOF (n=2), brain damage (n=1). Average followed-up at remote period 7.2 ± 0.9 yy. Absences of reoperations at ascending aorta were marked in all groups. In group A at 7 years we had observed: survival rate 49.3%, stability of good results occurred 23.3%. The reasons of deaths: progressive heart failure (9), myocardial infarction (n=1), arrhythmia (n=1). In group B at 7 years we had observed: survival rate 79.3%, stability of good results occurred 67.3%. The reasons of deaths: cancer (n=1), arrhythmia (n=2), ischemic disease (n=1). In group C at 7 years we had observed: survival rate 85.3%, stability of good results occurred 75.3%. The reasons of deaths: ischemic disease (n=2), arrhythmia (n=2), arterial hypertesion (n=1), sepsis (n=1), pneumonia (n=1).
CONCLUSIONS: Reconstruction of NOA during AVR by Nick`s operation and proposed original method of posterior aortoplasty are effective interventions. Konno operation cannot be performed in adult patients with pathologic of aoptic valve.

00014

Analysis of the probability of hospital lethality in cardiosurgical patients

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National Scientific Center of Surgery named after A.N. Syzganov, Almaty, Kazakhstan

BACKGROUND: The aim of the research is to simulate an operational risk in patients with congenital heart malformations, acquired heart diseases and ischemic heart disease by stratification scales EuroSCORE and Aristotle Basic Complexity score.
METHODS: 523 patients were totally examined and operated before surgical correction that got a stationary treatment since 2011 till 2017. There were: 291 (55,7%) patients with different forms of congenital heart malformations (CHM), 120 (22,9%) patients with isolated and combined acquired heart diseases (AHD) and 112 (21,4%) patients with chronic ischemic heart disease (IHD). The middle age of patients with CHM at the time of operation made 19,6±14,8 years. The youngest patient was 3 months old and eldest one - 67 years old. The middle age of patients with AHD at the time of operation made 48,8±14,3 years. The middle age of patients younger than 40 years made 27,3±9,5 years, and elder than 40 years - 55,4±7,4 years. The youngest patient was 10 years old and eldest one - 72 years old. The middle age of patients with IHD

at the moment of operation made 60,8±8,5 years. The youngest patient was 35 years old and eldest one - 82 years.
RESULTS: According to the Aristotle Basic Complexity score the operation risk in patients with CHM made (6,6±3,8) points in average that corresponded to the 2 level of the complexity. At the same time the peak value reached 21,5, and minimum value was 3,0 points. Operation risk according to the Aristotle Basic Complexity score in patients with CHM and complicated postoperational course was (8,2±4,1) points (3,0-17,5), and in patients with a mild course of the postoperational period – (6,2±3,5) points (3,0-21,5) in case of statistically evidence (p=0,001). The statistical analysis of logistical indicators of the EuroSCORE scale showed that there were significantly lower in patients with acquired heart diseases and mild postoperational course (approximately in 3 times) and with evident difference compared with patients having a complicated course: (4,0±3,5)% *versus* (12,8±1,4)% (p=0,006). The similar situation was traced also in the analysis of logistic indicators of a scale of EuroSCORE in patients with the chronic forms of an IHD: (3,6±3,3)% *versus* (8,8±1,2)%, respectively (p =0,087).
CONCLUSIONS: Operation risk according to the Aristotle Basic Complexity Score in patients with different types of CHM is statistically significantly differed in patients with complicated and mild postoperational course (p=0,001). Stratification scale of a risk assessment of the EuroSCORE represents certain opportunities to forecasting of the complicated course of the early postoperative period in patients with the AHD (p =0,006). In case of high and significantly high operation risks according to the scales EuroSCORE (p=0,006) and Aristotle Basic Complexity Score (p=0,001) we need a control with possible correction of a type, compatibility and volume of the surgical correction.

00202

Treatment of post-stenotic aneurysmus of ascening aorta: choice of correction's method

K. Vakulenko, V. Popov
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BACKGROUND: To research possibilities of surgical treatment of poststenotic aneurysms of ascending aorta (PAAA) by different methods.
METHODS: During 2000-2016 yy 581 patients (pts) with aortic stenoses (AS) and PAAA were consecutively operated in Institute. The average age of pts was 61,5±7,4 (18 - 71) yy. At all group 25 (4,3 %) pts were in II NYHA class, 274 (47,2%) pts were in III NYHA class and 282 (48,5%) pts in IV. Marfan`s syndrome and cystomedionecrosis were exclusions for performing in all groups. The following operations were performed: aortic valve replacement (AVR) + original method of wrapping tape operation (WTO) of AA (Popov V.) - 226 (38,9%) pts (group A), AVR + Robischek`s operation - 237 (40,8%) pts (group B), Benthal's (n= 94) and Wheat's (n= 9) operations - 118 (20,3%) pts (group C). In all cases in group A after AVR nylon tape (diameter 1 cm) was wrapped on AA from the basement of noncoronary cusp by 7-9 tours and fixated between them in proximal and distal part of AA. Additional procedures were also performed in group A: resection of AA in incision`s area (n=117). All operations were performed with CPB, moderate hypothermia (28 - 32 C), combined retro-antegrade crystalloid cardioplegia (mainly Custadiol). There weren`t any specific complications in all groups.
RESULTS: Hospital mortality were 0,8% in group A, 1,6% in group B and 3,1% in group C ($p < 0.05$). Cross-clamping time (min) were: (group A) - 79,1±10,9, (group B) - 101,5±13,6 and (group C) - 145,8±19,5 ($p < 0.05$). Absence of using donor product during all hospital period was 38,2% (group A), 7,2% (group B) and 1,7% (group C) ($p<0.05$). Staying in ICU was 49,3 ± 6,2 hours (group A), 54,2 ± 7,5 hours (group B) and 77,4 ± 9,2 hours (group C) ($p < 0.05$). During remote period (average 9,5±1,2 yy) we followed-up 531 pts. Actuarial survival at 9 years after operation was occured in group A - 91,2% (n=224), in group B - 88,3% (n=206), and group C - 79,7% (n= 101) ($p<0.05$). Echo examination of diameter of AA for group A (cm): preoperative (PRE) 4,7±0,5, postoperative (POST) (6-7 days) 3,8±0,3, remote period (RP) 4,0±0,4; for group B: preoperative 5,0±0,5, postoperative - 4,0±0,4, remote period 4,1±0,3 and for group C: preoperative 5,9±0,7, postoperative - 3,4±0,3, remote period 3,5±0,3. Reoperations at AA(AA`s graft replacement) were absents in all groups.
CONCLUSIONS: On the basis of our experience we recommend the expedient original method of wrapping tape operation for moderate forms of AAA (diameter of AA till 5,5 cm) during AVR. Reconstruction of AA for PAAA by WTO is safe, chipper and prevent aneurysm formation at AA at the remote period.

00323

Risk factors for replacement and plastic procedure in combined mitral-aortic valve disease

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BACKGROUND: To analyzed risk-factors in surgery of combined mitral and aortic valve diseases (CMAVD).
METHODS: 1158 adult patients (pts) with CMAVD were consequtive operated from 01.01.1981 till 01.01.2014 yy in Amosov Institute of Cardiovascular Surgery. Predominant genesis of CMAVD was rheumatism. 41 pts (3,5%) were in II NYHA class, 289 (24,9 %) pts were in III class and 828 (71,5%) pts in IV. The average age was 44,8 ± 8,2 (14 - 69) yy. The following procedures were performed: double valve replacement (DVR) (n = 814), mitral valve replacement + plastic procedure on aortic valve (AV) (n = 153), aortic valve replacement + plastic procedure on mitral valve (MV) (n = 164), plastic procedure on both valves (n = 27). The plastic procedures on AV were followings: aortic valvulotomy plus debridgment of fibrotic tissue and decalcification (n = 176), plastic procedure by Trusler (n = 2), plastic procedure by Carpentier (n = 2). The plastic procedures on MV were: open mitral commissurotomy (n = 171), plastic procedure by Carpentier ring (n = 3), plastic procedure (commissuroplasty) by Cooley, resection of posterior leaflet (n = 17). Only mechanical valves were used in any position: in the most cases monodisc, at the last period bileaflet. Concomitant tricuspid valve disease was corrected by De Vega procedure (plus tricuspid commissurotomy in organic disease) in 286 (24,7 %) pts. All operations were performed with cardiopulmonary bypass, moderate hypothermia (28-32 C), St. Thomas crystalloid cardioplegia with external cooling of myocardium and Custadiol at the last years.
RESULTS: The hospital mortality (HM) at the last 4 years (2010-2014 yy) was 3,5%. Average two times HM was higher for DVR than in cases with plastic procedure on one valve and replacement on other. The value of HM depends of following factors: IV NYHA class, end-systolic volume index of left ventricle (ESVI) < 15 ml/m.q. (especially for combined MS + AS), left ventricle`s ejection fraction < 0,35, systolic pressure in pulmonary artery > 90 mm.Hg, massive thromboses of left atrium (thrombotic masses more than 1/3 of volume), constrictive pericardytis, previous heart operation, calcification on both valves + 3, ESVI > 110 ml/m.q. (especially for combined MI +AI), organic tricuspid valve diseases, triple stenoses, cross-clamping time more than 180 minutes. The combination of desbribed risk-factors increases significantly value of HM.
CONCLUSIONS: Preferably to perform correction of CMAVD without complicated forms - in II or III NYHA class with bileaflet mechanical valve. Contraindication of operation is combination of 3 and more risk-factors.

00232

Application of a xenopericardial trileaflet valved conduits in patients with cyanotic congenital heart defects

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BACKGROUND: Ideal pulmonary trunk substitute remains one of unsolved problems of congenital heart defect surgery, numerous biological and synthetic materials are used nowadays, each having particular advantages and weaknesses. The aim of this study is to evalu-

ate functionality of customly made stentless xenopericardial conduits in patients with right ventricular outflow tract (RVOT) obstruction.
METHODS: In the period from 2001 to 2017, sixty-two consecutive patients with RVOT had xenopericardial stentless valved conduit implanted as a pulmonary trunk substitute. Mean age was 4.7±2.6 years (3.5-18). Underlying pathology was congenitally corrected transposition of great arteries with ventricular septal defect (VSD) and pulmonary stenosis in 22 patients, ventriculo-arterial discordance with VSD and pulmonary stenosis - 16 patients, tetralogy of Fallot/pulmonary atresia with VSD in 13 patients, and double outlet right ventricle with pulmonary stenosis in 11. Surgery was primary in 54 patients, 8 patients had previous synthetic conduit or allograft implantation. In 25 patients (40.3%, 1st group) conduit, including leaflets, was made solely of bovine xenopericardium was implanted, and xenopericardial conduit with bovine glisson valve was used in 37 patients (59.7%, 2nd group).
RESULTS: There were 6 in-hospital deaths, with no significant difference between two groups. At discharge, all of survived patients had mean right ventricle to pulmonary artery pressure gradient 23±12.4 mm Hg, with no or trivial regurgitation. Follow-up was 9.4±3.8 years (1-17). Overall actuarial survival in 5, and 10 years was 89 and 78 percent for the 1st group, and 95.3 и 91.2 percent for the 2nd. 10 patients returned for endovascular procedure (transcather pulmonary valve implantation – 1 patient, conduit balloon valvuloplasy – 2 patients, conduit stenting – 3 patients, intervention on pulmonary branches - 4). 9 patients required reoperation (patch enlargement of the free wall of the conduit was performed in all cases). Indications for reintervention (both, conventional end endovascular) were conduit stenosis (n=6), stenosis with regurgitation (n=5), infective endocarditis (n=1) in the 1st group and an isolated conduit stenosis (n=7) in the 2nd group. For the 1st group freedom from endovascular events in 5 and 10 years after surgery was 88% and 49,4% *versus* 96% and 91% in the 2nd. Freedom from reoperation at the same period was 96 and 58 percent in the 1st group *versus* 96 and 86 percent in the 2nd.
CONCLUSIONS: Main degenerative changes of xenopericardial conduits are wall and valve calcification, which leads to the return of pulmonary obstruction and regurgitation. The use of bovine glisson for valve substitution is accompanied by less frequent complication and reinterventions at follow-up.

00141

Use of *in-situ* bilateral internal mammary artery grafting for elective coronary artery bypass grafting

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BACKGROUND: Total arterial revascularization with bilateral internal mammary artery (BIMA) utilizes either Y or T configuration for achieving complete myocardial revascularization. This strategy is based on single supply source from left internal mammary artery. Using both the internal mammary arteries in-situ gives advantage of dual blood supply, making it safer. Using this configuration across all elective cases for coronary artery bypass grafting (CABG) needs few changes in the operative techniques. This study evaluates the efficacy of these changes to make it a viable option in all cases of CABG.
METHODS: Between January 2015 and November 2017 the unit operated a total of 725 cases of CABG. Of these a single surgeon operated 295 cases of which 70 were minimally invasive CABG. The rest of 225 cases were operated with in-situ BIMA as intention to treat strategy. To achieve adequate length changes were made in the extent of dissection of internal mammary arteries. Skeletonization of artery was done after its dissection to reduce the time of surgery. The sternal closure was done using bands to secure the wound.
RESULTS: This strategy was successful in 219 cases (97.4%). A mean of 2.85+ grafts were done (1-5) and to achieve a two arterial source, the LIMA required its extension by end to end vein anastomosis in 12 cases (5.5%). Only one patient was done on pump while rests were operated off pump (99.54%). Intra aortic balloon pump was used in 16

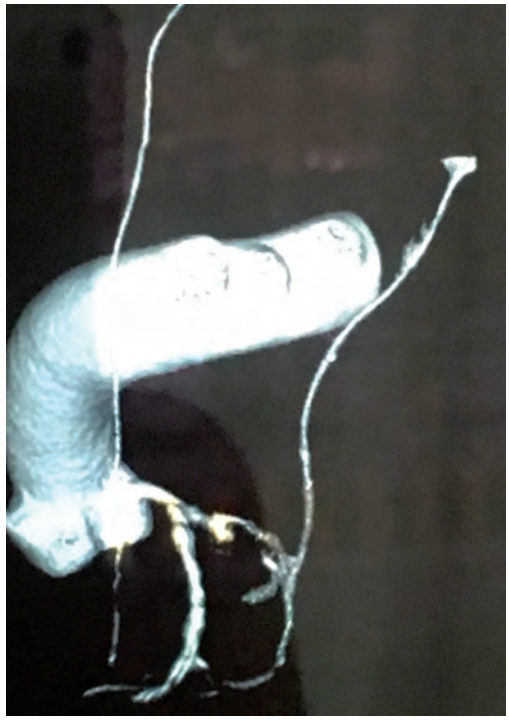

Figure 1.

Figure 2.

cases (7.3%). LV ejection fraction was mean 51.76% + 11.75, while 23 (10.5%) had LVEF <35%. 106 patients (48.4%) has old myocardial infarction and 11 (5%) had recent MI of < 72 hours and 30 (13.6%) had unstable angina. Diabetes Mellitus was present in 44.6% patients. There were 6 urgent and one emergency surgery. The mortality was in

10 (4.6%) patients with 4 re-explorations. There were 7 wound infections with no incidence of sternal dehiscence.
CONCLUSIONS: The use of in-situ BIMA use is safe and can be effectively applied to all patients in real world scenario. The wound complication with use of good surgical practice and sternal bands is negligible.

00270

Comparison of early morbidity and mortality of primary and iterative valve surgery

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[1]Department of Surgery, University of Salamanca, Salamanca, Spain; [2]Department of Cardiovascular Surgery, University Hospital of Salamanca, Salamanca, Spain

BACKGROUND: The need to perform new procedures is frequent in patients undergoing valvular surgery. The iterative procedures involve greater morbidity and mortality, although this may be due to the higher risk profile of the reoperated patients. We have carried out this study in order to compare early morbidity and mortality (30 days) of primary and iterative valve interventions in two groups of patients with similar preoperative characteristics.
METHODS: We included 3,288 consecutive patients undergoing valve surgery, associated or not with other cardiac procedures, at our institution between January 2000 and December 2016. Most of them, 2,985 patients, underwent primary surgery and 303 were submited to an iterative intervention. The propensity score was used to define two groups - study (S) and control (C) - of 241 patients each, whose only difference was the fact of having or not the antecedent of a previous valvular intervention. The morbidity and mortality of both groups was compared during hospitalization and at 3 months after surgery. For the statistical analysis, the Chi-square test and the Student's t test were used, calculated with the software application JMP 12.0 from the SAS Institute.
RESULTS: The overall incidence of postoperative complications was similar in both groups. Only pneumothorax (3.7% *versus* 0.4%), renal failure (27.4% *versus* 16.2%) and infections (16.2% *versus* 9.1%) were more prevalent in patients in the group S. Extra-renal depuration methods and tracheostomy were also needed more frequently in group S, whose stay in the ICU was longer, as was the magnitude of postoperative bleeding. The iterative interventions did not imply higher in-hospital mortality (13.7% vs 9.1%), as it was the case at three months of follow-up (18.7% vs 10.8%, p = 0.02). In group S, the etiology of valvular heart disease -especially prosthetic dysfunction and endocarditis- and associated nonvalvular surgery were factors independently related to early mortality. Surgery provided similar symptomatic relief in both groups at 3 months, with the majority of patients (80% *versus* 77%) being asymptomatic. Both EuroSCORE I (19.2%) and, to a lesser extent, Euroscore II (15%) overestimated the risk of iterative interventions.
CONCLUSIONS: The iterative valvular interventions involve a higher risk of some non-cardiac complications, a longer stay in the ICU, greater postoperative bleeding and a higher mortality at 3 months. Both EuroScore I and II overestimate the mortality of iterative interventions.

00288

Impact of extracorporeal life support on blood clot viscoelastic properties and platelet aggregation

L. Svetina [1], M. Petricevic [1], M. Zrno [1], I. Safradin [1], M. Urlic [1], S. Konosic [2], B. Biocina [1]

[1]Department of Cardiac Surgery, University Hospital Center Zagreb, Zagreb, Croatia; [2]Department of Anesthesiology, Reanimatology and Intensive Care, University Hospital Center Zagreb, Zagreb, Croatia

BACKGROUND: Extracorporeal life support (ECLS) based on extracorporeal membrane oxygenation is the end-stage treatment of heart failure or cardiogenic shock. Systemic anticoagulation is mandatory, and most of the complications such as thrombosis and bleeding, are often the result of incompatibility of the extracorporeal system and blood. Routinely performed laboratory blood clotting tests and platelet number do not offer sufficient understanding whether qualitative platelet dysfunction is present in a particular patient nor does it denote hypercoagulability, hyper or hypofibrinololysis. The aim of this retrospective study was to evaluate the effect of extracorporeal life support on blood clotting viscoelastic properties and platelet function through specific coagulation and aggregation tests. The primary outcome measure was prevalence of reported severe bleeding according to the Extracorporeal Life Support Organization (ELSO) definition. The second outcome measure were daily consumption of blood derivates and the amount of chest drainage.
METHODS: This retrospective study was conducted on 28 ECLS patients treated on the Department of Cardiac Surgery, University Hospital Center Zagreb. ECLS therapy was introduced in the setting of acute refractory cardiac failure (postcardiotomy or primary heart failure). Anticoagulation treatment was started according to the hospital protocol. Additionally, central laboratory-based coagulation testing including activated partial thromboplastin time (aPTT) and activated clotting time (ACT), and point-of-care coagulation test - rotational thromboelastometry (ROTEM®) and platelet function analysis (Multiplate®) were performed at predetermined intervals.
RESULTS: Binary logistic regression identified leaving the mediastinum open after surgery, erythrocyte, frozen plasma and thrombocyte transfusion and preoperative lactate levels as significant predictors of bleeding events. Cox regression identified INTEM CT, EXTEM CT and FIBTEM MCF tests as significant predictors of bleeding during the first five days post surgery. ROC analysis and Mantel-Cox log rank tests were then performed to analyze the hazard ratio for every test identified as a predictor of outcome. INTEM CT had a hazard ratio of 14.89, a positive predictive value of 82,94 % (CI 95 % 35,12-99,56 %), and a negative predictive value of 86,7 % (CI 95 % 65,6-97,23 %), with a cut-off value of 342,4. EXTEM CT had a hazard ratio of 5.7, a positive predictive value of 70,9 % (CI 95 % 28,32-96,2 %), and a negative predictive value of 86,1 % (CI 95 % 64,13-97,09 %), with a cut-off value of 92. FIBTEM MCF showed a hazard ratio of 3, a positive predictive value of 59,32 % (CI 95 % 25,6-87,5 %), and a negative predictive value of 89,2 % (CI 95 % 65,7-98,7 %), with a cut-off value of 33. The results yield a general conclusion that significant bleeding events can be predicted using certain tests from the ROTEM® test assay.
CONCLUSIONS: Data obtained by this study indicate that significant bleeding can be predicted by certain ROTEM® analysis tests, such as INTEM CT, EXTEM CT and FIBTEM MCF. It is more accurate and available in a shorter unit of time compared to the prediction of routine tests that study the coagulation status of the patient. The results of these tests have a practical value in treating patients on ECLS support.

FRIDAY APRIL 13

SESSION: CARDIAC YOUNG SURGEON AWARD SESSION

TIME: 08:00-09:30
ROOM 1: FRANCE

00097

Efficacy and safety of levosimendan *versus* dobutamine in patients undergoing cardiac surgery: a systematic review and meta-analysis

S. Salahia [1], D. Brascia [2], M. Shehata [3], S. Alazzeh [4], M.A. Eltobgy [5], A.K. Abdel-Moaty [6], M.N. Elkammar [7], N. Alhalabi [8], S.H. Alahwany [9]

[1]Faculty of Medicine, Ain Shams University, Cairo, Egypt; [2]Heart Center, Turku University Hospital and Department of Surgery, University of Turku, Turku, Finland; [3]Faculty of Medicine, Zagazig University, Zagazig, Egypt; [4]Faculty of Medicine, Mansoura University, Mansoura, Egypt; [5]Kasr Al Ainy School of Medicine, Cairo University, Cairo, Egypt; [6]Damietta Faculty of Medicine Al-azhar University, Damietta, Egypt; [7]Faculty of Medicine, Ain Shams University, Cairo, Egypt; [8]Faculty of Medicine, Syrian Private University, Damascus, Syrian Arab Republic; [9]Cardiovascular Institute, Ain Shams University school of Medicine, Cairo, Egypt

BACKGROUND: Our aim from this Study is to systematically review and conduct a meta-analysis of randomized controlled trials which as-

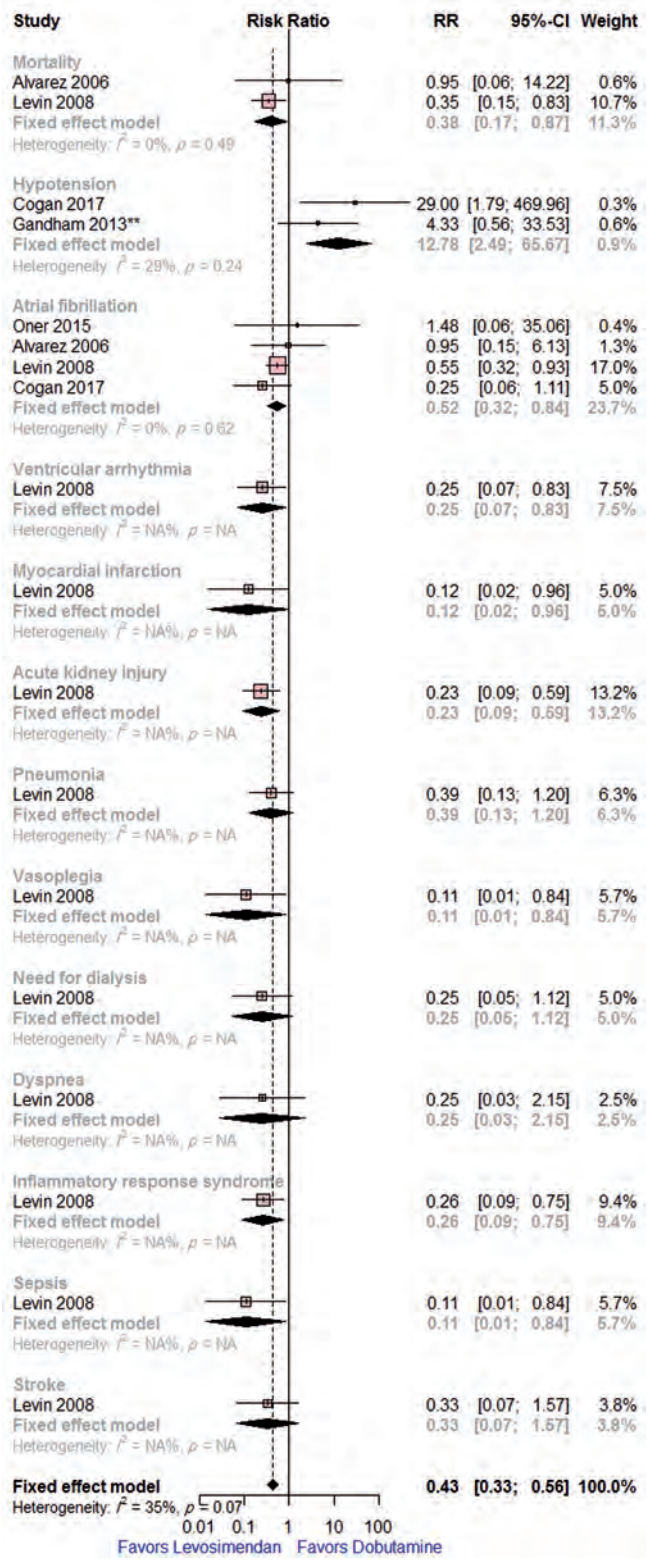


Figure 1.

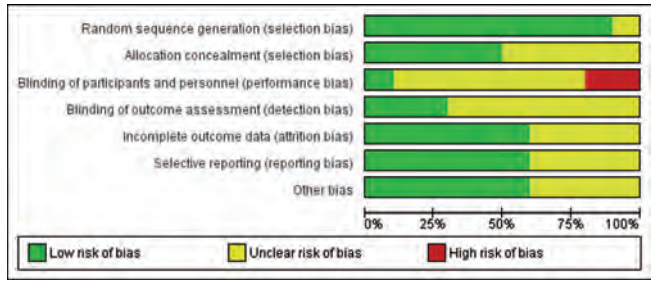
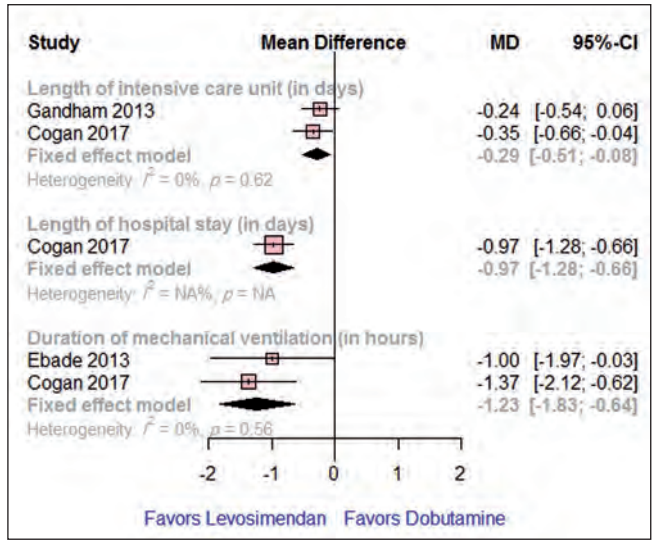


Figure 2.



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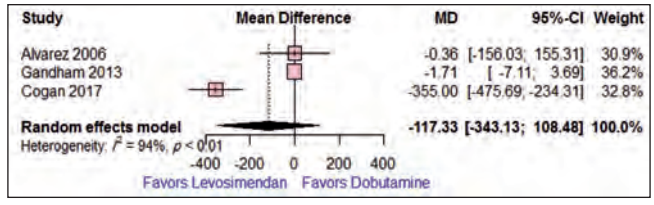

Figure 4.

sess the effectiveness and safety of using Levosimendan Compared to Dobutamine in undergoing Cardiac Surgery.
METHODS: We searched on PubMed, MEDLINE in Process, Scopus and Web of Science (previously ISI) to detect randomized controlled trials (RCTs) that evaluating the impact of Levosimendan and regarding the hemodynamic effect compared with Dobutamine
RESULTS: From a total of 707 entries identified, 10 RCTs were appropriate for inclusion into the final analysis. This meta-analysis indicated a statistical significant difference comparing Levosimendan with dobutamine regarding Primary outcomes such as Mean arterial Pressure (MD= -6.54, 95% CI [-10.36, -2.72],p=0.0008), Pulmonary capillary wedge pressure (PCWP)(MD= -3.05, 95% CI [-4.06, -2.04], p<0.0001), Cardiac index (CI)(MD= 0.60, 95% CI [0.48, 0.71], p<0.0001), Pulmonary vascular resistance index (PVRI)(MD= -84.60, 95% CI [-99.13, -70.08], p<0.0001), left and right ventricular stroke work index (LVSWI, RVSWI)(MD= 9.08, 95% CI [0.08, 18.08]),(MD= 1.06, 95% CI [0.85, 1.27]), respectively. Mixed venous oximetry (MVO)(MD= 8.07, 95% CI [2.44, 13.71], p=0.005), Central venous pressure (CVP)(MD= -1.89, 95% CI [-2.78, -0.99], p<0.0001) and Lactate(MD= -0.35, 95% CI [-0.56, -0.14], p=0.001). The overall pooled estimate showed a significant lowering risk of side effects (RR= 0.43, 95% CI [0.33, 0.56], p<0.0001), lower risk of mortality (RR= 0.38, 95% CI [0.17, 0.87]), atrial fibrillation (RR= 0.52, 95% CI [0.32, 0.84]), ventricular arrhythmia (RR= 0.25, 95% CI [0.07, 0.83]), myocardial infarction (RR= 0.12, 95% CI [0.02, 0.96]), acute kid-

ney injury (RR= 0.23, 95% CI [0.09, 0.59]), vasoplegia (RR= 0.11, 95% CI [0.01, 0.84]), inflammatory response syndrome (RR= 0.26, 95% CI [0.09, 0.75]), and sepsis (RR= 0.11, 95% CI [0.01, 0.84])While levosimendan had higher risk of hypotension that dobutamine (RR= 12.78, 95% CI [2.49, 65.67]) and no significant difference in terms of pneumonia (RR= 0.39, 95% CI [0.13, 1.20]), need for dialysis (RR= 0.25, 95% CI [0.05, 1.12]), dyspnea (RR= 0.25, 95% CI [0.03, 2.15]), and stroke (RR= 0.33, 95% CI [0.07, 1.57]).
CONCLUSIONS: This meta-analysis showed that in patients undergoing Cardiac Surgery the using of Levosimendan showed a statistically significant regarding most measured efficacy outcomes and with less adverse effects Compared to Dobutamine. Our findings clearly support using of levosimendan rather than Dobutamine specially in Cardiac Surgeries.

00351

Systematic review and meta-analysis of surgical outcomes in Marfan patients undergoing aortic root surgery by composite-valve graft or valve sparing root replacement

C. Flynn, D. Tian, A. Wilson Smith, T. D Yan
Royal North Shore Hospital, Sydney, Australia

BACKGROUND: A major, life-limiting feature of Marfan syndrome is the presence of aneurysmal disease. Cardiovascular intervention has dramatically improved the life expectancy of Marfan patients. Traditionally, the management of aortic root disease has been undertaken with composite-valve graft replacing the aortic valve and proximal aorta; more recently, valve sparing procedures have been developed to avoid the need for anticoagulation. This meta-analysis assesses the important surgical outcomes of the two surgical techniques.

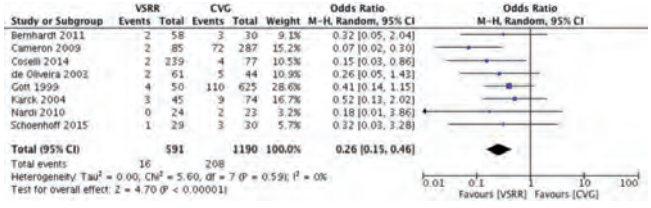

Figure 1.—Comparison of late mortality between CVG and VSRR.

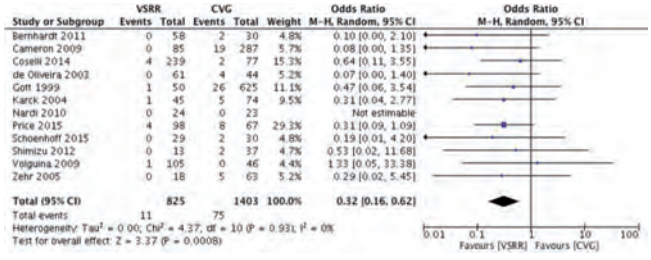

Figure 2.—Comparison of thromboembolic events between CVG and VSRR.

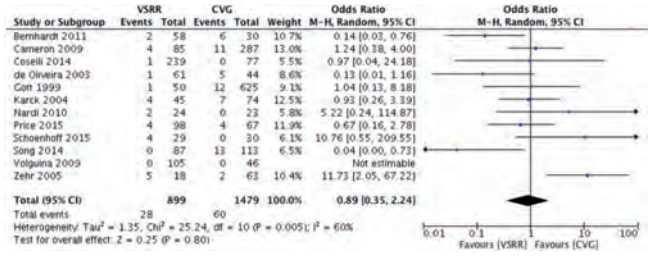

Figure 3.—Comparison of surgical re-intervention between CVG and VSRR.

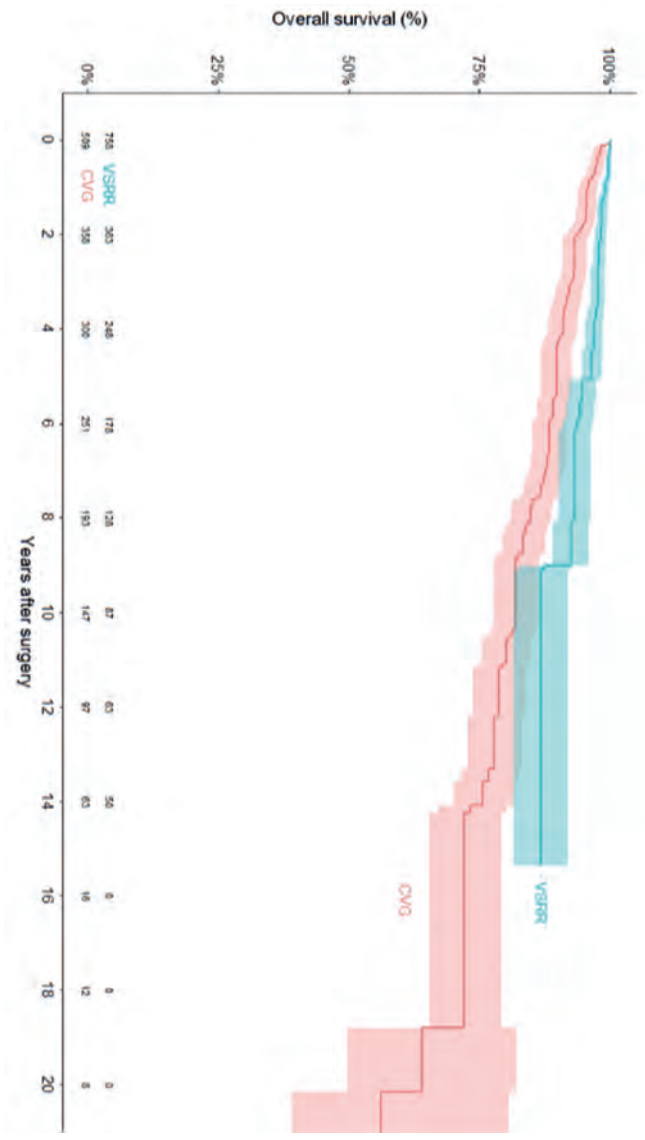

Figure 4.—Congregate Kaplan-Meier curve for overall survival between CVG and VSRR. Shaded region represents 95% confidence interval.

METHODS: A systematic review and meta-analysis of 23 studies reporting the outcomes of aortic root surgery in Marfan patients with data extracted for outcomes of early and late mortality, thromboembolic events, late bleeding complications and surgical reintervention rates.
RESULTS: The outcomes of 2976 Marfan patients undergoing aortic root surgery were analysed, 1624 patients were treated with composite valve graft (CVG) and 1352 patients were treated with valve sparing root replacement (VSRR). When compared against CVG, VSRR was associated with reduced risk of thromboembolism (OR 0.32 95% CI 0.16-0.62, p=0.0008), late haemorrhagic complications (OR 0.18 95% CI 0.07-0.45, p=0.0003) and endocarditis (OR 0.27 95%CI 0.10-0.68, p=0.006). Importantly there was no significant difference in reintervention rates between VSRR and CVG - OR 0.89 (95% CI 0.35-2.24, p=0.80).
CONCLUSIONS: There is an increasing body of evidence that VSRR can be reliably performed in Marfan patients, resulting in a durable repair with no increased risk of re-operation compared to CVG, thus avoiding the need for systemic anticoagulation in selected patients.

00143

Surgical technique, atrial arrhythmia, thromboprophylaxis and risk of thromboembolic events after fontan repair: a multicenter study

C. Deshaies [1], A. Shodouni [1], N. Poirier [1], R. Hamilton [2], P. Khairy [1]

[1]Montreal Heart Institute, Université de Montréal, Montreal, Quebec, Canada; [2]The Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada

BACKGROUND: Thromboembolic complications pose a significant risk to patients post-Fontan palliation. There is now reasonable evidence supporting the non-inferiority of antiplatelets over anticoagulants in preventing such events in low-risk individuals free of atrial arrhythmia. Still, the impact of the type of Fontan created remains controversial.
METHODS: Thus, we performed a retrospective multicenter cohort study evaluating the interplay between surgical method, thromboprophylaxis and atrial arrhythmia in the development of thromboembolic complications after Fontan repair. The study involved 3 Canadian and 9 American centers and included all patients born before July 2011 who had undergone Fontan surgery and completed routine follow-up at the same institution. Data collection ended in March 2015. Patients were divided in 3 groups based on the initial type of Fontan surgery received: an atriopulmonary connection (APC), a lateral tunnel (LT) or an extracardiac conduit (EC). The primary outcome included neurologic, peripheral arterial, renal, mesenteric, pulmonary and intracardiac thrombotic and thromboembolic complications. All reported events were blindly adjudicated. Multivariate competing-risk survival regression was then used to compare outcomes between the 3 surgical techniques while accounting for potential confounders.
RESULTS: All eligible 522 Fontan cases performed between 1974 and 2012 were included in the study. Of those, 112 (21.5%) were APC; 218 (41.8%), LT; and 192 (36.8%), EC. As expected, the 3 groups significantly differed with APC being mostly performed in earlier years (median: 1987 vs. 2000 (LT) and 2002 (EC); $p < 0.0001$), on older children (median: 6.9 years vs. 2.9 (LT) and 4.0 (EC); $p < 0.0001$), following systemic-to-pulmonary shunting (58.0% vs. 50.9 (LT) and 35.4 (EC); $p = 0.0002$) and without concomitant fenestration (21.4% vs. 69.7 (LT) and 68.8 (EC); $p < 0.0001$). The type of thromboprophylaxis prescribed greatly varied over time and across centers but there was a trend, in late follow-up, toward greater use of anticoagulants following APC (53.6% vs. 23.8 (LT) and 16.1 (EC); $p<0.0001$) and of antiplatelets following LT and EC (51.8% and 49.0% vs. 21.4 (APC); $p < 0.0001$). This paralleled longer follow-up (median: 24.8 years vs. 11.8 (LT) and 8.5 (EC); $p < 0.0001$) and a greater incidence of atrial arrhythmias (75.9% vs. 15.6 (LT) and 12.5 (EC); $p < 0.0001$) in the APC group. Upon follow-up, 40 (7.7%) patients required Fontan conversion, 13 (2.5%) were transplanted and 19 (3.6%) died. At a median follow-up of 11.6 years, a total of 71 thromboembolic events, 32 (45.1%) systemic and 39 (54.9%) venous, occurred in 67 (12.8%) individuals. Three multivariate Cox models □ stratified by surgical decade and adjusting for sex, age at correction, residual fenestration, prior hematologic complications, and time-varying exposure to thromboprophylaxis and atrial arrhythmia □ were estimated to evaluate the impact of Fontan type on systemic, venous and combined thromboembolic events. In final models, EC Fontans were associated with the lowest risk of systemic (subhazard ratio [95% CI]: 0.195 [0.039-0.973]) and combined (0.344 [0.131-0.905]) thromboembolic events. The use of antiplatelets also appeared to lower the risk of combined thromboembolic complications (0.540 [0.318-0.918]).
CONCLUSIONS: While reporting similar event rates to previously published literature, this multicenter retrospective cohort study is the first to highlight a significant association between EC Fontans and a lower risk for thromboembolic complications. This association remained significant in multivariable analyses. Still, future directions should include the confirmation of these findings using a prospective design.

00037

TAVI without CT is feasible and safe: a large single center experience

O. Cuevas [1], S. Kuwata [1], M. Taramasso [1], A. De Negri [2], P. Haager [3], H. Rickli [3], M. Zuber [2], F. Nietlispach [2], F. Maisano [1]

[1]Department of Cardiovascular Surgery. University Hospital Zürich, Zürich, Switzerland; [2]Department of Cardiology. University Hospital Zürich, Zürich, Switzerland; [3]Department of Cardiology. Cantonal Hospital of Saint Gallen, St. Gallen, Switzerland

BACKGROUND: Pre procedural planning with Multislice computed tomography represents a standard screening tool for assessing the anatomy of the aortic valve complex, the entire aorta, the iliac vessels and the femoral arteries, with the objective to determine most suitable vascular approach, nevertheless to perform this technique we need contrast in patients with renal impairmentmost of the times.
In our center Multislice computer tomography is perform in the majority of the patients who undergoing transcatheter aortic valve implantation (TAVI) but, In selected cases TAVI is performed without pre procedural Multislice computed tomography, in order to reduce the amount of contrast and to simplify the procedure. The aim of this study was to compare the 30 days outcomes of patients undergoing TAVI with or without pre procedural Multi slice computed tomography.
METHODS: We performed a retrospective analysis of consecutive TAVI procedures, that were treated with self-expandable prosthesis.

Table 1.

Vascular access site and access-related complications
Major vascular complications
Any aortic dissection, aortic rupture, annulus rupture, left ventricle perforation, or new apical aneurysm/pseudoaneurysm OR
Access site or access-related vascular injury (dissection, stenosis, perforation, rupture, arterio-venous fistula, pseudoaneurysm, hematoma, irreversible nerve injury, compartment syndrome, percutaneous closure device failure) leading to death, life-threatening or major bleeding,* visceral ischemia, or neurological impairment OR
Distal embolization (noncerebral) from a vascular source requiring surgery or resulting in amputation or irreversible end-organ damage OR
The use of unplanned endovascular or surgical intervention associated with death, major bleeding, visceral ischemia or neurological impairment OR
Any new ipsilateral lower extremity ischemia documented by patient symptoms, physical exam, and/or decreased or absent blood flow on lower extremity angiogram OR
Surgery for access site-related nerve injury OR
Permanent access site-related nerve injury
Minor vascular complications
Access site or access-related vascular injury (dissection, stenosis, perforation, rupture, arterio-venous fistula, pseudoaneuysms, hematomas, percutaneous closure device failure) not leading to death, life-threatening or major bleeding,* visceral ischemia, or neurological impairment OR
Distal embolization treated with embolectomy and/or thrombectomy and not resulting in amputation or irreversible end-organ damage OR
Any unplanned endovascular stenting or unplanned surgical intervention not meeting the criteria for a major vascular complication OR
Vascular repair or the need for vascular repair (via surgery, ultrasound-guided compression, transcatheter embolization, or stent-graft)
Percutaneous closure device failure
Failure of a closure device to achieve hemostasis at the arteriotomy site leading to alternative treatment (other than manual compression or adjunctive endovascular ballooning)
*VARC bleeding definitions

Table 2.

Early safety (at 30 days)
All-cause mortality
All stroke (disabling and nondisabling)
Life-threatening bleeding
Acute kidney injury—Stage 2 or 3 (including renal replacement therapy)
Coronary artery obstruction requiring intervention
Major vascular complication
Valve-related dysfunction requiring repeat procedure (BAV, TAVI, or SAVR)

*VARC definitions

One group undergone TAVI without pre procedural CT planning (no-CT group) and was compared with patients who undergone TAVI with pre procedural CT planning (CT group). We defined the Outcomes accordingly to the VARC-2 criteria.
RESULTS: A total of 152 consecutive patients were included in the study (mean age was 82 years IQR [77 – 86]; 87 females; 65 males). Thirty five patients were in the no-CT group (23%). The incidence of paravalvular aortic regurgitation at 30 day was statistically not significantly different in the two groups (71% mild, 2% moderate AR in the CT group; 75% mild in the no-CT group; p = n.s.). According to VARC2 criteria (Table 1), 9% of patients in the no-CT group experienced major vascular complications, compared to 5% in the CT group (p = n.s.). VARC2 composite early safety endpoint was reached in 19% in the no-CT group and in 11% in the CT group (p = n.s.).
CONCLUSIONS: In selected patients, TAVI can be safely performed without pre-procedural Computer Tomography. No differences in periprocedural outcomes were observed, with no differences in residual paravalvular Aortic Regurgitation.

00359

Is concomitant intra-aortic balloon pumping to extracorporeal membrane oxygenation leading to improved end-organ perfusion and hemodynamic condition?

I. Djordjevic [1], A.C. Deppe [1], J. Maier [1], M. Elskamp [1], T. Mühlbauer [1], S. Gerfer [1], A. Maul [2], I. Slottosch [3], E. Kuhn [1], A. Paunel-Görgülü [1], T. Wahlers [1], O.J. Liakopoulos [1]

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BACKGROUND: In cardiac surgery units veno-arterial extracorporeal membrane oxygenation (vaECMO) is increasingly used as salvage therapy. Non-pulsatile blood flow and blood activation related to ECMO therapy is known to induce end-organ malperfusion and systemic inflammatory response syndrome (SIRS). We investigated in a porcine ECMO model whether concomitant intra-aortic balloon pump (IABP) with restoration of blood flow pulsatility improves hemodynamic conditions, end-organ perfusion and attenuates the SIRS.
METHODS: Seventeen female pigs (weight 61±5 kg) were divided into three groups: Sham-operated group (n=5), ECMO group (vaECMO; n=7) and IABP group (vaECMO+IABP with 1:1 augmentation; n=5). Peripheral ECMO support was implemented through the groin vessels (target ECMO flow: 50 mL/kg/min, target mean arterial pressure (AP_{mean}: 50 - 60 mmHg). For 10 hours of extracorporeal circulation systemic hemodynamics, including left and right ventricular pressure, cardiac index (CI), coronary (CoBF) and carotid artery (CaBF) blood flow were continuous measured. Serial blood samples were obtained to analyse markers of inflammation (NETs: neutrophil extracellular traps) and cardio-renal injury.
RESULTS: Systemic hemodynamics after 10 hours of observational time (APmean: 59±10 (Sham) vs. 61±12 (ECMO) vs. 54±6 (IABP) mmHg; p=n.s.) and cardiac index (3.1±0.2 (Sham) vs. 3.0±0.5 (ECMO) vs. 3.1±0.4 (IABP) L/min/m²; p=n.s.) were comparable between the groups. Left ventricular end diastolic pressure (LV_{edp}) decreased significantly in the IABP group after 10 hours of ECMO support (27±14 mmHg ECMO vs. 9±12 mmHg; p=0.02). Adding IABP to ECMO failed to increase significantly CaBF (174±49 ECMO vs. 220±75 IABP mL/min; p=0.13) and CoBF (27±15 ECMO vs. 25±9 IABP; p=0.37). Creatinine levels (p=0.45), Troponin levels (p=0.42) and NETs (p=0.16) did not differ significantly between ECMO and IABP group after 10 hours of extracorporeal support.
CONCLUSIONS: Our data suggest that supplemental IABP support to ECMO therapy leads to significant reduction of LV_{edp} but fails to improve significantly end-organ perfusion and does not attenuate inflammatory injury.

00213

Predictive value of left and right atrial contractile properties on the occurrence of postoperative atrial fibrillation

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BACKGROUND: Atrial fibrillation (AF) is a common complication after cardiac surgery. AF affects up to 40% of all cardiac surgery patients postoperatively and increases the risk of stroke and mortality. Predictive factors for postoperative AF are not well defined. The impact of atrial myofilament properties as a predictive factor on the occurrence of postoperative AF has not been evaluated yet. We therefore aimed to evaluate calcium-induced myofilament contractility in left and right atrial skinned human fibers obtained during elective coronary artery bypass grafting (CABG).
METHODS: Right (RAA) and left atrial auricular (LAA) tissue of 105 patients, scheduled for elective CABG procedures was obtained and prepared for skinned fiber measurements. All patients had preoperative sinus rhythm. We divided the patients in two groups: 40 patients developed AF in the postoperative course and /or before discharge (group A) and 65 patients maintained sinus rhythm (SR). We performed calcium induced force measurements of the right and left atrial auricular fibers by exposing them to 12 increasing steps of calcium concentration (pCa 4.5 to 7.0). Experimental and clinical data as well as preoperative echocardiographic data were saved in a database.
RESULTS: Group A developed significant lower LAA force values in the range of pCa of pCa 4.5 to 5.4 ($p < 0.05$) with maximal force values of 0.89 mN (A) *versus* 1.1 mN (B), p 0.02. For group A a similar phenomenon was observed for RAA fibers, but less pronounced: significant lower values were observed from pCa 4.5 to 5.2 with maximal force values of 0.67 mN (A) *versus* 0.91 mN (B), p 0.04. Regarding clinical data no significant difference among groups was observed. Comparison of preoperative echocardiographic data revealed for group A significant higher values for LA area (19.7 vs. 18.1 cm2, p 0.04), LA volume (57.4 vs. 49.3 ml, p 0.03), E/E' (12.3 *versus* 9.7, p 0.02), deceleration time (232 vs. 215 ms, p 0.04.)
CONCLUSIONS: Reduced right and left atrial myofilament contractility was associated with the occurrence of postoperative AF. Furthermore the patients wit postoperative AF present significant more signs of diastolic dysfunction in the preoperative echo compared to those, who maintain SR postoperatively. These preliminary results suggest a patient's intrinsic tendency to develop postoperative AF, which could have impact on therapeutic strategies reducing the morbidity associated with AF.

00338

Long-term prognosis after surgical treatment for active infective endocarditis: predictors of early and late survival in a 14-year period study

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BACKGROUND: Cardiac surgery is a life-saving procedure in patients diagnosed with infective endocarditis (IE); nevertheless sur-

gical risk and long-term life expectancy are difficult to predict. The aim of the present study was the assessment of the long-term survival and freedom from reinfection after surgery for IE, trying to delineate the IE-specific risk factors for mortality.
METHODS: An observational retrospective study was developed including all the patients who underwent surgery for active IE from 2002 to 2016. In-hospital mortality was assessed, and a long-term follow-up was conducted. Survival and freedom from reinfection were analyzed using the Kaplan-Meier method. Univariate Cox proportional hazards regression was employed to identify predictors of long-term mortality. A predictive model for mortality was constructed through the methodology of all possible equations analysis. All the variables with a significant association with mortality in the univariate analysis ($p<0.05$), and those that were considered potentially clinically relevant based on previously published literature were included for model development. The most parsimonious multivariate Cox regression model, with the lowest Bayesian information criteria (BIC), was selected.
RESULTS: A total of 180 patients were included during the study period. The in-hospital mortality rate was 26.1%. Survival analysis using Kaplan-Meier method revealed a cumulative survival of 63.5% after a maximum follow up of 13 years. Mean follow up after surgery was 34.90 months (SD 26.36). Patients who survived the immediate post-operative period had a late survival of 90.2%, 85.2% and 54.6% after one, two and five-years, respectively. 54% of late mortality was related to a cardiovascular origin. Univariate proportional hazard regression analysis identified eighteen variables as factors related with decreased survival ($p<0.10$): age, prosthetic valve endocarditis, multivalvular affection, previous cardiac surgery, arterial hypertension, dyslipidemia, cardiogenic shock, neurological deficit, functional class NYHA>III, severe pulmonary hypertension, renal failure, preoperative mechanical ventilation, preoperative inotropic support, prosthetic dysfunction, S. Aureus infection and thrombocytopenia. A predictive model was generated through all possible equations analysis method, and the independent factors related to reduced survival were in the selected model (BIC 488.5) were: age (HR 1.03 95% CI 1.00-1.05), multivalvular affection,(HR 2.89 95 CI 1.49-5.61), prosthetic valve endocarditis (HR 1.54 95% CI 0.90-2.63), functional class NYHA>III (HR 3.09 95% CI 1.22-7.88), preoperative inotropic support (HR 1.47 95% CI 0.78-2.78), S. Aureus (HR 1.4 95% CI 1.41 95% CI 0.7-2.811) and thrombocytopenia (HR 1.57 95% CI 0.89-2.79). The selected model had an adequate concordance (Harrell's C test =0.771). Besides, reinfection occurred in 12.0% of the cases. One-year and five-years freedom from reinfection was 95.2% and 87.4%. The analysis of the combined endpoint of recurrence of IE and mortality showed that age, NYHA>III and preoperative mechanical ventilation were also independent factors for reinfection. Otherwise, vegetations resulted to be an independent factor only for reinfection (Share Hazard Ratio 0.4 CI 95% 0.2-0.8).
CONCLUSIONS: Despite the high mortality rate in the early postoperative period of cardiac surgery for active IE, long-term survival and freedom from reinfection were satisfactory. Age, multivalvular affection, prosthetic valve endocarditis, functional class NYHA>III, preoperative inotropic support, S. Aureus infection and thrombocytopenia were independent predictors of late mortality.

00081

Heart transplantation with allograft preserved *ex-vivo* by TransMedics Organ Care System during 16 hours

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BACKGROUND: Kazakhstan is the 9th largest country in the world. The using of Organ Care System (OCS) Transmedics is the important option for the development of heart transplantation (HTx) program in a country with huge territory. We report a case of heart transplantation with allograft preserved ex-vivo by Transmedics OCS during 16 hours.
CASE REPORT: From 2012 till 2017 we performed 62 heart transplantations in the National Research Cardiac Surgery Center, Astana, Kazakhstan. We used OCS for donor heart preservation in 46 cases (74%). At the end of December 2017 we received information about donor in the city, which is located approximately 500 km from Astana. Unfortunately due to bad weather conditions we could not use aircraft, so our team went for a donor heart by the train, which was the 3rd case in our clinical practice when we used such type of transport. Donor was a 60 year old woman after hemorrhagic stroke with the B (III) blood group and negative Rh factor. Left ventricle ejection fraction was 58%, end-diastolic volume was 113 ml, valves were normal by echocardiography. Before the heart harvesting she required short episode of cardiopulmonary resuscitation due to asystole, that's why we started operation earlier. Coronary arteries were without signs of atherosclerosis visually and palpatory. After taking of 1500 ml of donor blood for the priming solution and delivery of cardioplegia with Custodiol the heart was explanted and attached to the OCS. The heart started beating almost immediately spontaneously with sinus rhythm with heart rate of 70. The transportation time by train was 8 hours. Pre- and post-train transportation time by car was 1 hour. We used pacing of the heart due to sinus bradycardia and ultrafiltration in the OCS. After delivery of the donor heart we checked laboratory tests again. Only then the decision to perform operation was taken. Recipient is a man with the same blood group and Rh factor. He underwent HeartMate 3 left ventricular assist device implantation 1 year ago and had driveline infection. So the team needed time for performing of cardiolysis. Summary, the preservation time in the OCS was 16 hours. During all this time the mean aortic pressure and coronary blood flow were normal. Throughout the ex-vivo perfusion process the highest level of lactate was 8 mmol/l. According to our experience the mean venous lactate at the end of perfusion of all OCS cases was 7.1 ± 1.1 mmol/l, and we used these allografts due to the severe shortage of donor hearts with outcomes comparable to results of other centers. After the operation the heart started beating spontaneously with sinus rhythm. We put central veno-arterial extracorporeal membrane oxygenation (ECMO). He had 2 revisions due to bleeding, and the patient was weaned from the ECMO on the 3rd day. Patient was during 2 weeks in the intensive care unit due to respiratory insufficiency and dependence from moderate doses of inotrops. Now he is in normal ward. Tissue Doppler Imaging parameters (S'LV lat, S'LV med, S'RV) are 7-8 sm/s.
CONCLUSIONS: In conclusion, according to our results OCS Transmedics is the safe method for myocardial protection in distant harvesting and preservation of donor hearts.

SESSION: VASCULAR YOUNG SURGEON AWARD SESSION

TIME: 08:00-09:30
ROOM 2: ALSACE

00240

Toward the use of patient-specific structural simulations of endovascular repair in the clinical practice

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BACKGROUND: In the last years the use of computer-based simulations has been introduced in the surgical field with the aim of providing ambitious predictive information during the decision-making process. The aim of this work is to use Finite Element Analysis (FEA) to investigate in a patient-specific case the deployment of two partially overlapped endografts and evaluate wall apposition and conformation in a challenging tortuous descending thoracic aorta.
METHODS: In this work we considered a 78 year old patient with aneurysm in the descending thoracic aorta. TEVAR was performed using two Zenith Cook stent-grafts (Cook Inc, Bloomington, Ind), sized 36-161 and 36-113. Six months after intervention, Computed Tomography (CT) examination showed type IB endoleak. The first step of the simulation set-up involves the segmentation of medical images acquired by the pre-operative CT scan in order to obtain a 3D surface reconstruction of the aortic lumen. Then, virtual stent-graft models are created using

Abaqus/Explicit (Simulia, Dassault Systèmes, Providence, RI, USA) and a suitable mesh for structural FEA is defined. Nitinol properties are assigned to the struts and woven polyester properties to the fabric. The virtual deployment is simulated using the finite element solver Abaqus/Explicit. First, the endograft is crimped by a catheter and curved from a straight position to the vessel's centerline. Then, once the endograft is positioned according to measurements on post-operative centerline, a uniform enlargement of the catheter surface along its length is performed to allow the endograft self-expansion. The second stent is implanted inside the first one; thus creating the overlapping region. The simulation procedure is performed twice by changing the order of deployment of the proximal and distal endograft.
RESULTS: The predicted positions of the stent-grafts are compared with the real post-operative outcome extracted from CTs. First simulation has been performed by taking into account the same deployment sequence as in the reality (proximal device deployed first). Simulation outcomes showed a correct apposition along all the stent-graft, with exception to the distal landing zone, where a mismatch between the surface of the distal deployed stent-graft and the aorta has been recorded. This is consistent with what has been observed in the clinical investigations. In addition, we demonstrated that, by changing the deployment sequence (distal device deployed first), a better apposition of the simulated stent-graft in the distal landing zone is obtained.
CONCLUSIONS: This study demonstrated that patient-specific computational simulations could provide additional predictive information about the behavior of the devices, both during deployment and after expansion, driving the surgeons during the decision-making process. In the future, additional simulations on a larger dataset will be performed.

00315

Mid-term results of hybrid replacement of aortic arch diseases

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BACKGROUND: Aortic arch (AA) disease is a complex and challenging condition. Treatment remains associated with high mortality and morbidity rates1. During the last decade, new technical solutions like frozen elephant trunk (FET) technique have been developed and introduced into clinical practice1,2. The FET technique has been shown to be safe and effective, with favorable early and long-term outcomes3-5. Two devices are available: the E-vita open plus (Jotec, Inc., Germany) and the ThoraflexTM (Vascutek Ltd, UK) hybrid grafts. The aim of this study was to assess short and midterm outcomes of FET technique for the treatment of complex thoracic aortic disease (CTAD).
METHODS: This was a retrospective study compiling consecutive cases of CTAD treated with FET technique between March 2013 and February 2017 in our academic institution. Demographic characteristics, clinical presentations, surgical details and outcomes were recorded.
RESULTS: Nineteen patients were included (63.2% male). The mean age was 56.1±2.7 years (range, 37.7-76.4). The main comorbidities were high blood pressure (78.9%), history of ascending aorta replacement (63.2%) and Marfan syndrome (21.1%). Indications for surgery were: type I aortic dissection (AD) in 11 cases, type II AD in one case, type IIIb AD in 3 cases, aortic arch (AA) aneurysm in 2 cases, AA ulcer in one case and an association of type IIIb AD and AA aneurysm in one case. Selective antegrade cerebral perfusion and moderate hypothermia were used in all cases. Sixteen ThoraflexTM and three E-vita open plus were implanted. Mean cardiopulmonary bypass time was 249.1±17 minutes (range, 158-414) and circulatory arrest time was 44.9±4.9 minutes (range, 22-108). Five patients (26.3%) died within 30 days: two from hemorrhagic choc, one from cardiogenic choc, one from acute mesenteric ischemia and one from disseminated intravascular coagulation with multivisceral failure. The 14 remaining patients presented with recurrent laryngeal nerve paralysis in 5 cases, regressive stroke in 4 cases, regressive paraplegia in 2 cases, and diaphragmatic paralysis, hemorrhagic choc and acute mesenteric ischemia in one case each. The mean follow-up was 18.3±3.5 months (range, 0.1-47.8). No patient was lost to follow-up. Seven (36.9%) early reinterventions were performed: 2 for bleeding, 2 for acute mesenteric ischemia, one for lower limb ischemia, one for prosthetic aortic valve endocarditis and one for native ascending aorta rupture in patient with type I acute AD. Four patients underwent distal stent graft extension during follow-up. One patient died 14 months postoperatively from hypokalemia. All grafts were patent.
CONCLUSIONS: FET technique is a revolution in its ability to offer a one-stage treatment of extensive AA disease. However, it remains an invasive technique with a level of risk similar to that of open surgery.

00346

Metabolic profiling of carotid atherosclerosis

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BACKGROUND: Stroke is a leading cause of death and disability worldwide. Approximately one quarter of all strokes are secondary to carotid atherosclerosis. There is a clinical need to improve risk stratification of carotid atherosclerosis, to better target surgical or interventional therapy and prevent stroke. This study aimed to determine diagnostic biomarkers of high-risk carotid atherosclerosis, and ensure the validity of such markers in the presence of alternative phenotypes of atherosclerotic disease.
METHODS: 150 patients were recruited according to the following criteria:
Symptomatic >50% carotid stenosis
Non-carotid stroke/TIA
Asymptomatic >50% carotid stenosis
Asymptomatic controls with <50% carotid stenosis
Abdominal aortic aneurysm
Intermittent claudication
Disease groups were matched for age, gender, cardiovascular risk factors, haematological parameters, renal function and lipid status. Blood and urine was collected from all patients and analysed through global metabolic profiling (1H-NMR Spectroscopy, HILIC-Mass Spectrometry and Lipid Profiling-Mass Spectrometry). Acquired spectra were compared across groups using computational multivariate data analysis to determine markers of high-risk carotid atherosclerosis.
RESULTS: Statistical models derived from urinary spectra proved stronger than serum datasets, in particular with HILIC-Mass Spectrometry (positive ionisation mode). Application of computational OPLS-DA resulted in discrimination of symptomatic carotid atherosclerosis from asymptomatic disease, aneurysmal disease, and intermittent claudication. Differentiating metabolites span a vast array of compounds including lipid derivatives, amino acid derivatives and nucleotide derivatives.
CONCLUSIONS: This is the first study to identify urinary metabolic biomarkers of high-risk carotid atherosclerosis, differentiating symptomatic carotid atherosclerosis from asymptomatic disease, and aneurysmal and peripheral arterial disease. Targeted temporal studies are now required for clinical validation and to determine the variation of acute biomarkers with time.

00278

Decellularized aortic allografts: laboratory and preclinical results

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BACKGROUND: To assess an efficacy of different detergents used for aortic allograft decellularization, to determine residual detergent con-

centration in the aorta and to assess decellularized aortic tissue function in systemic circulation.
METHODS: Human aortic allografts were decellularized using deoxycholic acid 1% (group 1, n=10), sodium deoxycholate 0.5%, sodium dodecylsulfate 0.5% (group 2, n=10), sodium deoxycholate 1%, Triton X-100 1% (group 3, n=10), Triton X-100 3%, EDTA 0.04% (group 4, n=10). Valve specimens were subjected to histologic (H&E, morphometry) and histochemic (alcian blue, orcein) studies before and after decellularization. Residual DNA content in aorta was assessed by spectrofluorometry at 460-600 nm. Mechanical testing was performed using material testing machine. Residual detergent concentration in aorta and washing solution was assessed using high-performance liquid chromatography. In an animal model (dogs, n=5) standard cryopreserved and decellularized allografts were compared when implanted into the infrarenal aorta.
RESULTS: According to histologic morphometry study, cell reduction (cell quantity in 1 view) in group 1 was 100 (86-115) to 31 (3-62) cells, $p<0.05$; in group 2 - 110 (74-135) to 1 (0-1) cells, $p<0.05$; in group 3 - 93 (74-129) to 40 (35-49) cells, $p<0.05$; in group 4 - 56 (46-62) to 45 (39-55) cells, $p>0.05$ (Wilcoxon criteria). There was a statistically significant difference in cell reduction between groups 1 and 2 ($p<0.001$) and between groups 2 and 3 ($p<0.001$), with greatest reduction in group 2 (Mann-Whitney test). According to histochemic studies, connective tissue matrix was not affected in any of the groups. Indexed DNA reduction in group 1 was 0.839 (0.717-0.927), in group 2 - 0.945 (0.916-0.969), in group 3 - 0.804 (0.537-0.899), in group 4 - 0.639 (0.287-0.871). There was a statistically significant difference in indexed DNA reduction between groups 1 and 2 ($p<0.05$), between groups 2 and 3 ($p<0.05$) and between groups 2 and 4 ($p<0.01$), with greatest reduction in group 2. Mechanical testing results of fresh, cryopreserved and decellularized allografts (group 2) were: Fmax - 31.3±2.0 N, 33.4 N (29.4-37.3 N), 33,1 N (18.2-38.9 N), accordingly ($p>0.05$); σ – 0.9 MPa (0.7-1.2 MPa), 0.9 MPa (0.8-1.1 MPa), 0.9 MPa (0.6-1.1 MPa), accordingly ($p>0.05$). Residual concentration in aorta for sodium dodecylsulfate was below 0.15 mcg/mg, for sodium deoxycholate – below 3.5 ng/mg. In an animal model all dogs survived and were followed-up for 1.5-2 months after the operation. In the decellularized part of a conduit inflammation was negligible. It was found endothelization of allografts' inner lumen and vasa vasorum migration from outside into the media layer, which evidences host cells migration into aorta connective tissue matrix. At macroscopic examination mural thrombus formation was revealed, which requires anticoagulant medication during first months after the operation.
CONCLUSIONS: The most profound aortic allograft decellularization was achieved using sodium deoxycholate 0.5% and sodium dodecylsulfate 0.5%, with statistically significant cell reduction and DNA reduction, without affecting connective tissue matrix and mechanical properties of the valve. Residual sodium dodecylsulfate and sodium deoxycholate concentrations in aorta were much lower than toxic thresholds for those chemicals. Decellularized allografts can withstand the demanding systemic circulation, being repopulated with recipients' cells.

00159

Renal function after open, endovascular and hybrid repair techniques for pararenal abdominal aortic aneurysm

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BACKGROUND: In pararenal aortic aneurysm (PAA), the proximity to the renal arteries entails their clamping with consequent kidney ischemia causing postoperative renal impairment. Historically, open aneurysm repair (OR) was the established treatment, and nowadays in the endovascular era two other techniques are added to the treatment armamentarium: complete endovascular aortic repair EVAR (Parallel grafts (PG), fenestrated or branch stent graft) and hybrid repair (a combination of open surgery and EVAR). We investigated postoperative renal function, morbidity and mortality after each procedure.
METHODS: We conducted a retrospective analysis of patients diagnosed with pararenal aortic aneurysm who underwent OR, EVAR or HR from January 2002 to February 2012.
RESULTS: A total number of 79 patients were identified from our database. Of these, 68 patients (86%) were men and mean age was 73 ± 8 years of age. Juxtarenal aortic aneurysm (JAA) was identified in 45.6 % of all cases. Impaired renal function (RF) defined as eGFR<60ml/min/1.72m2, was found in 37.5%, 42.8% and 37.8% before open, hybrid and endovascular repair techniques, respectively, whereas a history of preexisting renal disease was only found before HR and EVAR (11.5% and 18.9%, respectively). Postoperative impairment of renal function was more frequent after OR and HR than after EVAR with mean eGFR values at 48, 46 and 65 ml/min/1.72m2, respectively ($p < .001$). After OR and HR, impaired renal function was found in 87.5% and 88.5%, respectively. In contrast, 43.2% of the patients after EVAR developed an impaired RF. At discharge, 1 and 12 months of follow up, mean eGFR (in ml/min/1.72m2) after OR was (58, 72, 70), HR (67, 64, 50) and after EVAR (70, 67, 63) with no statistical difference. At follow up, only 44% at 1 month and 58% at 12 months of all patients were reported to have an impaired RF. Computed tomography (CT) scans showed no statistical difference in terms of reduced kidney perfusion or kidney injury. Pulmonary complications appeared more frequently after OR and HR (31.2% and 38.5%) than after EVAR (5.4%). A total of 12 patients (15%) died during hospital stay, 4 patients after OR, 7 after HR and 1 after EVAR ($p = .008$).
CONCLUSIONS: Impairment of renal function is less frequent in patients with PAA treated by complete endovascular treatment with parallel grafts, compared to open repair or hybrid repair. No patient treated with parallel grafts required permanent dialysis. Furthermore pulmonary complications and mortality appear to be lower after complete endovascular treatment.

00293

Standardization of the technique as key to maintain early outcomes of a specific technique with routine delayed shunting in carotid endarterectomy for asymptomatic patients

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BACKGROUND: The use of shunting techniques during carotid endarterectomy (CEA) is controversial. Objective of this study is to evaluate the role of standardization of a specific technique with CEA and routine "delayed" (just after plaque removal) shunt insertion for asymptomatic patients in maintaining early outcomes among a decade.
METHODS: A retrospective review of all asymptomatic patients who

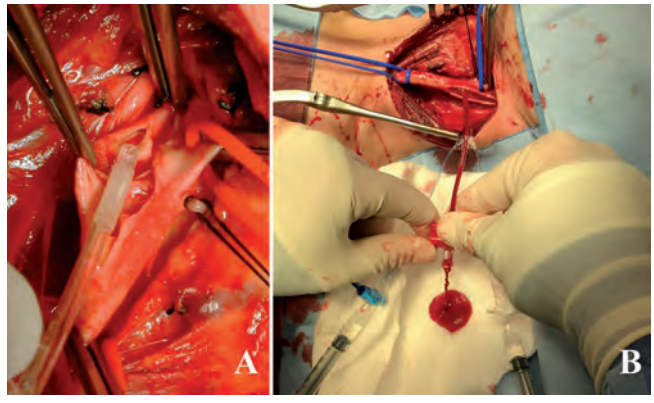

Figure 1.

Figure 2.

underwent carotid endarterectomy during a 10 years single center experience (January 2007 to December 2016) was performed. Surgical technique was standardized in all its steps among every surgeon. Under general anesthesia carotid endarterectomy was routinely performed with delayed shunt insertion; the further time-consuming maneuvers as accurate peeling and CEA closure with synthetic patch or internal carotid artery (ICA) reimplantation were performed under shunting; before suture completion, shunt was removed and suture secured. We analyzed demographic characteristics, relevant clinical and intraoperative variables and 30 days outcomes. We finally analyzed the effects of time and operator's expertise on neurological complication rate.
RESULTS: 1745 elective CEAs were performed in asymptomatic patients with ≥ 70% stenosis between 1990 and 2016. Overall, 147 patients (8.9%) presented with contemporary contralateral stenosis ≥ 70% and 58 patients (3.5%) had contralateral ICA chronic occlusion. The mean first clamping time was 4 min ± 1.3. No patients died perioperatively; intra- or peri-operative onset of myocardial infarction has been detected in 19 patients (1.1%). Perioperative relevant neurological complication rate (RNCR) was 0.6% (major stroke: n= 6, 0.4%; minor stroke: n= 4, 0.2%). RNCR distribution was maintained equal over time comparing 5-years time periods (2007-2011 and 2012-2016, P= .175) and operator's expertise, considering both the length of service (Seniors, with more than 20 years of service; Experienced, with more than 5 years of service and Young, with less than 5 years of experience, .P .883) than the volume of interventions per year per surgeon (High volume, more than 30 CEAs; Medium volume, between 15 to 30 CEAs, and Low volume, less than 15 CEAs, .P .931). Univariate analysis demonstrated that none of the major clinical and anatomical factors analyzed, included time period and operator's expertise, had an impact on neurological complication rate except diabetes (.P .040).
CONCLUSIONS: Routine shunting with delayed insertion after plaque removal seems to be a safe and effective technique. Standardization of surgical techniques is mandatory in order to maintain results over time, and contributed to maintain RNCR <1% during carotid endarterectomy in asymptomatic patients independently from operators, time period and other major clinical factors.

00272

Results of hybrid repair of multilevel lesions of the brachiocephalic arteries

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BACKGROUND: The main objective of our research is to assess the results of hybrid repairs of multilevel and tandem stenosis of brachiocephalic arteries.
METHODS: From December 2016 in clinic of the Department of Vascular and Interventional Surgery Federal Almazov National Medical Research Centre were treated 21 patients with multilevel atherosclerosis lesions of carotid arteries. The patient's age were from 49 to 82 years old. Men - 9 (42,9 %), women - 12 (57,1 %). Risk factors was identified: smoking - in 85,7 %, arterial hypertension - in 95,2 %, hyperlipidemia - in 62 % of cases; coronary artery disease (CAD) - in 62 %. Lower extremities artery disease (LEAD) was presented in a one half of cases. 9 patients with combined cardiologic pathology requiring cardiosurgical treatment. The distributions of lesions were: 10 patients with right internal carotid artery and brachiocephalic trunk hemodynamic stenosis, 9 - with left common and internal carotid arteries stenosis and 2 - with tandem stenosis of bifurcation and distal part of internal carotid artery. In all cases were performed hybrid procedures which included carotid bifurcation endarterectomy and affected artery stenting. Follow-up consisted of clinical assessment, duplex ultrasound and CT-angiography during 3-6 months after treatment.
RESULTS: All procedures performed with local anesthesia, with standard open approach to carotid arteries. Femoral approach used to endovascular stage. Embolic protection device performed in 57,1 %, in other cases carotid clamps were used. Technical success was 100% and there was no neurologic morbidity and mortality in 30 days. There were some local wound complications such as bleeding and hematoma in 2 cases. There was no wound infection, prophylaxy antibiotic doses performed with common scheme. All patients got dual antiplatelet therapy before procedure with loading doses and continued till 1 month after. The 3 to 6 months results after operations are the absence of thrombosis, stroke, including after aortocoronary bypass. In 1 case of brachiocephalic trunk stenting there was a residual stenosis aboout 60 %, requiring balloon angioplasty due to recurrent upper intermittent claudication in 4 month after the first procedure.
CONCLUSIONS: The use of hybrid surgical interventions in multilevel lesions of brachiocephalic arteries allows to reduce the risk of TIA and ischemic strokes in patients, and achieve immediate satisfactory results after the surgical treatment. It demonstrates an effective and safe correction of hemodynamically significant tandem stenosis of brachiocephalic arteries, avoiding neurological complications during surgical treatment of the patients with concomitant cardiologic pathology.

SESSION: VASCULAR ABSTRACT SESSION I: THORACIC AORTA

TIME: 08:00-09:30
ROOM 3: STRASBOURG

00043

Comprehensive spinal cord protection in aortic arch surgery using the frozen elephant trunk technique

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BACKGROUND: The objective of the study was to access the extended occlusion of the intercostal arteries by a stent graft in the development of postoperative spinal cord injury (SCI) during aortic arch surgery using the frozen elephant trunk (FET) technique.
METHODS: A total of 39 consecutive patients with type A and type B aortic dissection underwent total aortic arch surgery using the FET technique between March 2012 and December 2017 at Cardiovascular Surgery Department of Cardiology Research Institute, Tomsk National Research Medical Center (Tomsk, Russia). The mean age of the patients was 54.7±10.5 years. All the patients underwent single-stage repair of the aortic arch with the implantation of a hybrid stent graft "E-vita open plus" into the descending thoracic aorta. Moderate hypothermia and antegrade cerebral perfusion via the innominate artery were utilized when left common carotid artery and left subclavian artery were clamped. The stent graft was attached distal to the left subclavian artery in 29(74.4%) cases. The proximal anastomosis of the hybrid stent graft was performed in zone 0 (1 patient) and zone 2 (9 patients). The mean diameter of the implanted stent graft was 27.7±2 mm (24-30 range). Supra-aortic vessel reconstruction was performed in an *"en bloc"* fashion (71.8%) or separately (28.2%).
RESULTS: The mean interval of cardiopulmonary bypass, cardiac arrest, lower body circulatory arrest, and unilateral antegrade cerebral perfusion was 219.2±61.7 min, 139±48.1 min, 61.7±21.8 min, and 45.1±12.7 min respectively. The incidence of PND and TND was 2.4% and 4.8% respectively. The 30-day mortality was 4.8%. No permanent SCI occurred. The distal edge of the stent graft was in T7-T12 range. Its lower edge was implanted at the T9-T12 level in 28(71.8%) cases. Preoperatively, the mean

number of intercostal arteries was 10±1 on the left side and 10±2 on the right side (p=.59). Postoperatively, the mean number of open segmental arteries was 3±2 on the left and 4±1 on the right (p=.003).
CONCLUSIONS: The FET procedure is associated with the occlusion of most (⅔) of the intercostal arteries. The innominate artery cannulation for cerebral perfusion, moderate hypothermia, and perfusion pressure are the key point to adequate intraoperative prophylaxis of SCI. The maintenance of sufficient main blood flow in the subclavian and iliac arteries is equally important. The level of the distal edge deployment of the stent graft does not play a defining role.

00104

Results of *in-situ* cryopreserved arterial allografts in thoracic and thoracic-abdominal aortic mycotic aneurysms

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BACKGROUND: Mycotic aortic aneurysm is a rare pathology. Complete resection of the aneurysm followed by in situ revascularization is the most common treatment. The thoracic aorta is often affected. Due to the low incidence and the severity of this entity, there is currently no guidelines regarding the first-line treatment strategy. The aim of this study is to assess the results of cryopreserved arterial allografts in thoracic and thoraco-abdominal mycotic aneurysms.
METHODS: We retrospectively analyzed all patients who presented with a mycotic aneurysm of the thoracic aorta associated or not with an abdominal localization and treated with in situ cryopreserved arterial allograft, between January 2009 and December 2017. Primary endpoints were: early morbi-mortality, reinfection rate and late evolution of allografts.
RESULTS: Fourteen men (median age = 68 ± 8,8 years) were operated, two of them in emergency. During the same period, 175 patients were treated for primary or secondary aortic infection with cryopreserved arterial allografts at the thoracic and at the abdominal stage. Five patients had immunosuppressive therapy, two were diabetics and one immunodepressed by underlying pathology. Seven aneurysm were limited to the thoracic aorta: 5 were located on the descending thoracic aorta (4 aortic replacements and 1 limited resection with patch plasty), and 3 on the aortic arch (3 replacements). Six patients had thoracic and abdominal or thoraco-abdominal aneurysms and needed a thoraco-abdominal replacement of the aorta: 1 TAA (thoraco-abdominal aneurysm) type I, 1 TAA type II, 1 TAA type III and 3 TAA type IV. A thoracic endograft was implanted in one patient as a bridge before allograft replacement of the thoracic and endograft explantation. Most common micro-organisms were: Staphylococcus Aureus (4 cases) and Escherichia Coli (2 cases). Nine procedures required an extra-corporeal circulation, with deep hypothermia circulatory arrest in 3 cases, and one patient was operated using a passive shunt. In-hospital mortality was 35,7%. Causes of death were: 2 colonic ischemiae, 2 pulmonary infections, 1 hemorragic shock. Two patients (14,3%) required postoperative extrarenal epuration, and one paraplegia (7,1%) occured. Six surgical reinterventions were necessary: 4 hemorragies, 1 cardiac tamponnade, 1 colectomy. Mean follow-up was 14,1 months (median = 8,4 months). No reinfection, early rupture and no late degeneration of the allograft occured.
CONCLUSIONS: Mycotic aneurysms affecting the thoracic and the thoracoabdominal aorta are associated with a high morbi-mortality. In situ cryopreserved arterial allografts are resistant to reinfection and showed no sign of early or late degeneration in this context.

00145

Blunt thoracic aortic injury: treatment strategy and pitfalls

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BACKGROUND: Blunt thoracic aortic injury (BTAI) is known to be the second leading cause of death in blunt trauma, following head injury. The introduction of thoracic endovascular aortic repair (TEVAR) has revolutionized the management of BTAI. The majority of BTAI occur at the isthmus of the descending thoracic aorta, in which BTAI has potential endovascular options for repair. We report on the experience of endovascular treatment for recent BTAI in our hospital with some literature review.
METHODS: This was a retrospective observational study in a tertiary emergency medical center. There were 36 patients diagnosed with BTAI between January 2014 and December 2017; 1 (2.8%) had grade I BTAI, 8 (22.2%) had grade II, 11 (30.6%) had grade III, and 16 (44.4%) had grade IV. 15 cases were out-of-hospital cardiopulmonary arrest (OHCA) and died without return of spontaneous circulation. There were 21 cases of non-OHCA. As a parameter of general condition at hospitalization in non-OHCA cases, systolic blood pressure (sBP, mmHg), heart rate (HR, bpm), shock index (HR/sBP), hemoglobin (g/dl), D-dimer (μg/ml), fibrinogen (mg/dl) were selected. We made three groups in non-OHCA cases; 9 cases who died in a few hours after presentation (group D), 6 cases in whom TEVAR for BTAI were completed (group T) and 6 conservative therapy cases (group C). All aortic repair surgery were TEVAR.
RESULTS: In 21 cases of non-OHCA BTAI, 18 were males (85.7%), and the average age was 57 years (16 - 89 years). All cases were transported to our hospital in the acute phase after injury. The leading cause of injuries was a traffic accident (17/21, 81.0%) and the second was a fall (4/21, 19.0%). The aortic injury site was the aortic isthmus in 20 cases (95.2%) and the ascending aorta in 3 cases (14.3%). All patients in group T and group C were discharged uneventfully. The t-test was used to compare outcomes between groups. There was no significant difference between group D and T in the comparison of the parameters. In group D or T in comparison with group C, sBP was significantly lower (D, T, C; 77±49, 99±17, 127±13; P=0.026, 0.008) and D-dimer value was higher (125±84, 78±47, 27±26; P=0.035, 0.088). These two parameters were considered to be potential prognostic factors for BTAI. All six cases in Group T were hemodynamic instability or hemorrhagic shock at the time of admission, and the thoracic aorta diameter ratio was 0.89 on average at the time of hospitalization compared with that of the control CT. In one case showing a small grade III BTAI, intracranial hemorrhage and elevated D-dimer, we experienced a fatal aortic rupture in 2 hours after hospitalization.
CONCLUSIONS: It is considered that expeditious TEVAR will greatly benefit BTAI patients with multiple injuries. On consideration of image findings, we should prepare for TEVAR as the primary treatment in BTAI patients with hypotension or elevated D-dimer value on admission. In addition to elevated D-dimer, high blood pressure accompanied by head trauma may also be a risk factor causing aortic rupture. We should know that trauma patients who admitted with hemorrhagic shock have a smaller aortic diameter compared with a control condition.

00382

Distal aortic remodeling and lumen volume changes after PETTICOAT procedures for acute and chronic complicated aortic type B dissection

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BACKGROUND: Thoraco-abdominal type B aortic dissections(TBD) pose significant challenges in operative techniques and management of the arch and distal thoracic aorta. The PETTICOAT (Provisional Ex-Tension to Induce COmplete ATtachment) procedure has been yet reported in the literature. The objective is to analyse the thoraco-abdominal aortic remodelling comparing the differences of volume changes of the true(TL) and false lumen(FL) based on computed tomography(CT) scans reconstructions before and after treatment of acute TBD (fresh thrombus) and chronic TBD (chronic thrombus) with the PETTICOAT concept.
METHODS: Analysis of the aortic remodelling and volume changes obtained from CT scans with the software Horos and OsiriX 64 bits version. Case 1: An acute complicated TBD, 51 yo male who received

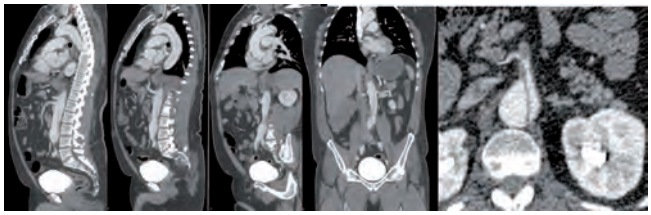

Figure 1.

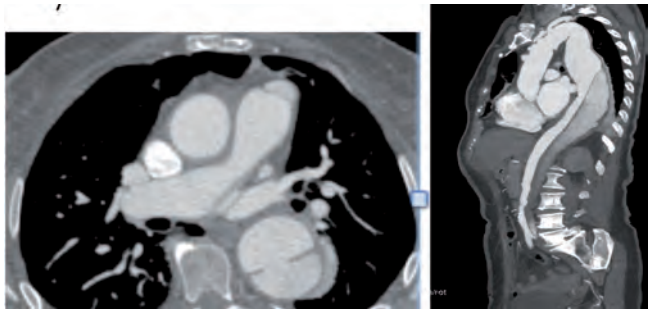

Figure 2.

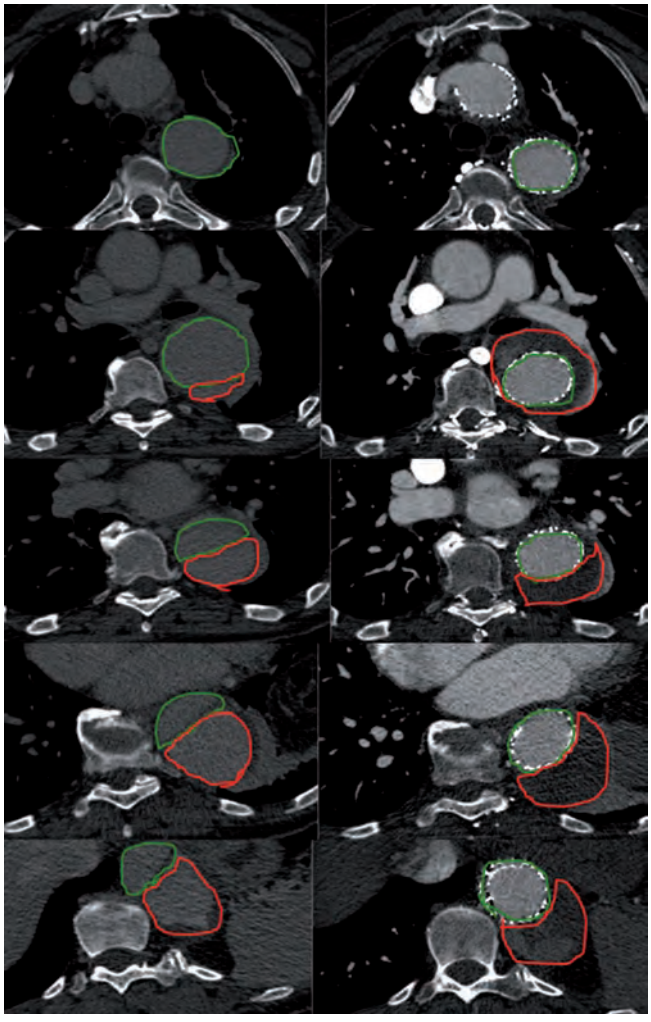

Figure 3.

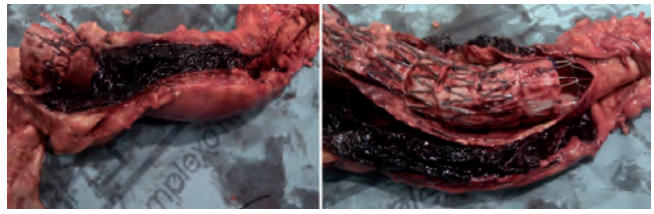

Figure 4.

endovascular treatment with Zenith Dissection Endovascular System (COOK). Case 2: 72 yo woman, chronic complicated TBD with a 7 cm descending thoracic aorta aneurysm, 10 years before emergent repair of a type A dissection (Fig2). Endovascular treatment with 3 covered stentgrafts C-TAG (GORE WL), 2 self-expandible stent system SINUS-XL (OPTIMED), and a covered stent graft Viabahn (GORE WL). Case 3: 67 yo active and sportive man. Contained rupture of a giant left iliac aneurysm as complication of a chronic TBD desestimated for treatment in other centers. Succesful endovascular repair combining 2 proximal covered stents C-TAG (GORE WL), 2 self-expandible stent system SINUS-XL (OPTIMED), and a bifurcated stentgraft EXCLUDER (GORE WL).
RESULTS: Initial clinical (30 days) success was observed in all cases. The patient with the acute type B dissections death 45 days after procedure. Autopsy showed a correct deployment of the stentgrafts with a thrombosed false lumen(Fig4). In all patients the True Lumen volume were increased and the False Lumen decreased, specially in the thoracic segment. (Fig 3) We registered a larger aortic remodelling after the treatment of the acute dissection compared with the chronic cases.
CONCLUSIONS: Few studies comparing of aortic remodelling and lumen volume calculations before and after PETTICOAT technique in acute VS chronic TBD have been reported. These 3 cases show a potential short term therapeutic benefit of the PETTICOAT technique. In all cases inmediate increase in True Lumen was observed, and the sealing of the aneurysms in the chronic cases. Different behaviours between aortic remodelling and volume changes were observed with larger aortic remodelling in the acute case, and also comparing the thoracic and abdominal segments, according to others reports in the literature.

00333

Endovascular surgery for acute and chronic type B aortic dissection

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BACKGROUND: Open surgery of the type B Aortic Dissection remains a clinical challenge with high morbidity and mortality, Thoracic EndoVascular Aortic Repair (TEVAR)is developing as a strong alternative to open surgery. TEVAR has shown improved early and late results, compared with open surgery or medical therapy, mostly in complicated patients. Advantages include the closure of proximal entry tear with depressurization of the false lumen, the change of thrombosis of the false lumen and redirection of flow toward true lumen and release any distal malperfusion. Continued patency of the false lumen has been reported to lead to aneurysmal dilatation. False lumen rupture causes 60% of associated deaths. To assess the outcome after TEVAR for tyte B Aortic dissection, we retrospectively reviewed our long term experience.
METHODS: From March 2001 to December 2012, out of 267patients undergone TEVAR, 129 patients were treated for tB-AD, 81 for complicated acute dissection occurring within 14 days after onset of symptoms and 48 for chronic dissection after 14 days from first symptoms. In patients with acute complicated dissection (within 2 weeks) indications for TEVAR were: impending rupture, malperfusion syndromes (visceral, renal, lower limb), refractory hypertension or pain despite adequate medical terapy, rapid aortic espansion or dilatation, shock or hypotension. In patients with chronic compli-

cated dissection (after 6 weeks) indication were: recurrent symptoms, aortic diameter > 55 mm or expanding > 5 mm/yr or aortic diameter >40 mm with true and false lumens both patent, according to VIRTUE Registry of Type B Thoracic Dissections [4]. A spiral computed tomographic (CT) scan, were performed preoperatively to assess suitability for TEVAR, for measuring and localizing purposes and determining the size of the implanting stent grafts. The procedure was performed in an hybrid operating room. Patients received general anesthesia and mechanical ventilation with invasive monitoring. In all cases, vascular access was achieved by surgical dissection of one of the femoral or iliac arteries.
RESULTS: The procedure was successfully completed in all patients with no periprocedural death, neurological complications, paraplegia or surgical conversion. The overall 30-days mortality was 3.9 % (5 patients), it was similar in patient with acute or chorinic dissection. Patients had a median ICU stay of 2 days and a mean length of hospital stay of 6.6 ± 3.4 days. Aortic related mortality was 8.0% (10 patients). A secondary endovascular or conventional procedure was required in 25 patients (20.1%). There were no statistically significant difference between the acute and chronic groups.
CONCLUSIONS: The endovascular surgery is a real alternative to conventional surgical treatment in the treatment of acute and chronic type B Aortic Dissection. Early and late outcome supports the safety and effectiveness of TEVAR for type B aortic dissection without differences between acute and chronic group. Mortality and morbidity is predominantly related to the patient preoperative status. However, long-term follow-up is mandatory to confirm clinical safety of this procedure.

00180

First French experience with the custom made BOLTON Relay PlusR fenestrated device in aortic arch pathology

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BACKGROUND: Management of Aortic arch disease is a big challenge because of aortic arch curvature and the proximity of the aortic valve. Treatment by open surgery is the gold standard, however there remain concerns about the need for cardiopulmonary bypass with it's significant mortality and morbidity. Thoracic endovascular aortic repair (TEVAR) has provided many options but can be difficult in some cases with available fenestrated devices. Hybrid repair with debranching and reimplantation combined with scalloped and fenestrated devices has overcome the problem. Herein, we report the first French cases with custom made BOLTON-Relay-PlusR fenestrated device.
METHODS: Between November 2013 and June 2017, 4 patients were treated in the University Hospital of Tours and 1 in Rennes' University Hospital with the custom made Bolton Relay PlusR fenestrated device. The proximal landing zone was classified using Ishimaru's landing zone map with a landing zone in zone 0 in all cases. Indications were as follows: 1 aneurysm, 1 penetrating ulcer, 1 anastomotic aneurysm after cardiac surgery for Type A dissection and 2 Type B dissections.
RESULTS: Technical success was achieved in all cases. At per-operative arteriography there were no retrograde dissection, no endoleaks, no fenestration's related complications and all vessels were patent. Mean irradiation and operative time were 22 mn (range 16-29 mn) and 130 mn (range 110-178 mn) respectively. Mean contrast volume used was 134 ml (range 100-200). Four patients required Intensive Care Unit hospitalization for a mean time of 2,6 days (range 2-5 days). Overall hospitalization time was 9,8 days (range 6-15 days). There was no early death, spinal cord ischemia nor myocardial infarction at 30 days. Mean follow-up was 8,6 months (range 3-18 months). There was one late death 18 months after initial surgery from a lung cancer and a stroke related to an anti-phospholipid syndrome in another patient who completely recovered at discharge.
CONCLUSIONS: According to our experience, the custom made BOLTON-Relay-PlusR fenestrated device must be considered as an interesting tool in the management of aortic arch disease. The relative easiness of the prosthesis delivery makes this technique more accessible, reproducible and safe although it requires a long learning curve. A larger series with a longer follow-up is required to establish further conclusions.

SESSION: CARDIAC ABSTRACT SESSION I: HEART FAILURE & GUCH

TIME: 08:00-09:30
ROOM 4: COLMAR

00383

The age of 60 as a cutt-off point for heart transplantation

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BACKGROUND: To estimate outcomes after Heart transplantation (HT) in patients over 60 years old.
METHODS: 270 HT operations have been conducted in our Centre during HT program developing since 2009. Among all operated patients 2 groups were selected: the 1st group - the main group with 34 patients aged 60 years and older; the 2nd group - the control group with 67 patients aged 50-59 years. The average age in the main group was 54,8±3,0 years and in the control group - 63,9±3,1 years ($p<0,0001$). There were no significant differences in proportions of women and men: 2,9%(n=1) and 97,1%(n=33) respectively in the 1st group *versus* 13,4%(n=9) and 86,6%(n=58) in the 2nd group ($p>0,05$). The most wide spread etiology leading to HT was dilated cardiomyopathy which was in 50% (n=17) in the 1st group and 53,7% (n=36) in the 2nd group of patients; then ischemic cardiomyopathy came in 35,3% (n=12) and 41,8% (n=28) respectively; other cases occupied 14,7% (n=5) and 4,5% (n=3) respectively. The groups of patients were similar by the following parameters: body mass index was 22,0±9,7 in the 1st group *versus* 23,3±10,7 in the 2nd group ($p>0,05$); systolic pulmonary artery pressure - 49,9±10,4 *versus* 50,6±11,7 mm Hg respectively ($p>0,05$), donor age - 35,1±8,4 *versus* 35,9±8,7 years respectively ($p>0,05$), cold ischemic time - 192,8±43,8 *versus* 203,1±57,8 min respectively ($p>0,05$). 30-day and 1-year survival rates were estimated as outcomes after HT.
RESULTS: Patients from the main group treated in ICU after HT for 10,5±8,4 days, the time was similar with the patients from the control group - 8,0±4,6 days ($p=0,62$).There were no significant differences in outcome in 2 groups: 30-day survival was 79,4% in the main group and 86,6% in the control group ($p>0,05$); 1-year survival was 67,6% in the 1st group and 77,6% in the 2nd group ($p>0,05$). However a strong relationship between age increase and 1-year survival reduction was revealed only in the group of patients aged 60 years and older ($p<0,05$).
CONCLUSIONS: Starting from the age of 60 the eligibility ctiteria for HT should be scrupulously assessed for each patient because probability of favorable 1-year outcome after this cut-off age point is becoming lower with each new year of patient's age.

00242

Extended echocardiographic analysis of RV function in heart transplant recipients with rejection episodes

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BACKGROUND: Acute cellular rejection (ACR) is, despite enormous advances in diagnostics and therapy in the last decades, a major cause of morbidity and mortality after orthotopic heart transplantation (oHT) Our objective was to evaluate various echocardiographic parameters focusing on the right ventricle (RV), because all

endomyocardial biopsies (EMB) were performed from this ventricle, to identify patients with characteristics of biopsy-proven ACR.
METHODS: A total of 204 consecutive patients who underwent oHT between June 2014 and March 2016 were included. All patients underwent extended echocardiography by protocol on the same day of endomyocardial biopsy (EMB) blinded to the results. Various conventional and speckle-tracking derived parameters of the left and right ventricle were analysed including rotational mechanics of the LV.
RESULTS: No EMB was classified as grade 3R (severe ACR). Grade 0R was found in 135 (67%), grade 1R in 52 (26%) and grade 2R in 15 (7%) patients. Comparing group G0R vs. G1/2 the RV analyses revealed a significant increase of the end-systolic area and decrease of the fractional area change due to ACR. Furthermore we found significant increase of tricuspid regurgitation equal or larger than mild, presence of pericardial effusion, decreased TDI systolic velocity at the lateral tricuspid annulus, increased Tei-index and decreased global longitudinal strain of LV and longitudinal strain of RV inflow tract. Further significant differencies were increase of septal and posterior wall thickness of LV, higher E/e`at the lateral mitral annulus, decrease of the TDI systolic velocities at the lateral mitral annulus. In the subgroup analysis apical rotation, apical rotation rate and twist of the left ventricle were found to be decreased in the G1/2 group. Combined cut-off analysis of the GLS-LV, LS-RV, twist, apical rotation and rotation rate resulted in a negative predictive value (NPV) of 83.3% and positive predictive value (PPV) of 79.3%. Combined analysis of GLS-LV and LS-RV resulted in a high NPV of 97%, but a low PPV of 11.7% for detection of G2 rejection.
CONCLUSIONS: Speckle-tracking of RV had the highest NPV/PPV of all RV parameters for ACR enabling to reduce routinely performed EMB. Combination of LV/RV-GLS provided the highest NPV supporting clinical decision if EMB is not available or unsuccessful.
Keywords: Echocardiography, strain, speckle-tracking, acute rejection, heart transplantation

00295

Coronary endarterectomy in patients with end-stage coronary artery disease: a fifteen-year single surgeon experience of 356 consecutive patients

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BACKGROUND: Surgical treatment strategies for patients presenting with end-stage coronary artery disease (CAD) is controversial. Such patients are usually judged not to be candidates for percutaneous intervention nor for surgical revascularization. Although coronary endarterectomy (CEA) has been introduced as an option to treat such pathologies, many surgeons aim to avoid it due to its complexity resulting in incomplete myocardial revascularization. Therefore, we aimed to review our results with CEA in CABG surgery.
METHODS: We present a retrospective single surgeon observational study, evaluating the results of patients presenting with end-stage CAD (i.e. total or sub-total occluded vessels) undergoing CABG and CEA for. CEA was performed by traction technique followed by coronary vessel flushing with cardioplegia besides proximal/distal vessel massaging to get rid of residual debris. Primary endpoints involve incidence of major adverse cardiac and cerebrovascular events and 30-day mortality. Secondary endpoints included results of follow-up imaging as well as overall survival.
RESULTS: A total of 356 patients (age: 68.1±9.2 years, male: 87.1%) undergoing coronary artery bypass and coronary endarterectomy +/- concomitant procedure between 01/2003-12/2017. Of these, 264 patients undergoing isolated CABG. Most patients (323/356, 90.7%) had a three-vessel disease, with a total of 4.2±1.1 coronaries grafted. CEA target was the LAD-territory in 200/447 (44.7%), LCX-territory in 61/447 (13.7%), and RCA-territory in 186/447 (41.6%). CEA-graft was venous in 275/447(61.5%) and arterial in 172/447(38.5%). Mean transit-time flow for the CEA-graft was 66.7±45 ml/minutes. Early results reported an incidence of stroke in 13/356(3.6%), myocardial infarction in 3/356(0.8%), and 30-day cardiac-related mortality for isolated CABG in (8/264, 3%) patients. Follow-up imaging with a cardiac catheter or angiographic computerized tomography was available in (65/356, 18.2%) patients with (86) grafts after CEA. Graft occlusion was observed in only 9/86 (8 were saphenous vein grafts, one was RITA) but all LITA to the LAD grafts were patent. Finally, overall mortality was (60 /356, 16.8%) at the mean follow-up of 54±35 months.
CONCLUSIONS: Patients with the end-stage coronary artery disease are high-risk candidates for surgical revascularization. Complete myocardial revascularization in such patients requires adequate experience of the performing surgeon. Although CEA is a complex procedure, it still offers a surgical option to achieve complete revascularization with acceptable short and long-term results. Traction-CEA with distal second incision and subsequent anastomosis in case of disrupted CEA-cylinder is our preferred method in comparison to open-CEA.

00335

Long-term clinical outcomes after isolated tricuspid valve surgery

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BACKGROUND: Isolated tricuspid valve surgery (ITVS) is a rare procedure, but its frequency is steadily increasing worldwide. Long-term clinical results, and the factors that predict long term survival after ITVS are not well stablished. The aim of this study was the analysis of long-term survival, clinical outcomes, and the identification of factors related to a worse prognosis after ITVS.
METHODS: A retrospective cohort study was conducted, which included all the patients who underwent ITVS in our institution since 2003, with a long-term clinical follow-up. The primary objective was long-term survival, and the analysis of the variables associated with increased mortality using Proportional Hazards Cox Regression, expressed as hazard ratios (HR). As a secondary objective we analysed the following clinical outcomes: failure of the implanted prosthesis, absence of clinical improvement (NYHA class IV), and hospital readmission due to congestive heart failure.
RESULTS: During the study period, 64 ITVS were performed. Mean age 61.81 years (SD 11.64), 67.19% female sex. Estimated mortality (Logistic Euroscore I) was 11.82% (SD 9.10). Twelve patients had a tricuspid valve repair, and 52 a valve replacement (22 mechanical; 30 biological). Tricuspid regurgitation was the most frequent indication for ITVS (75.0%). This cohort had an advanced heart disease: 65.62% had a previous open-heart procedure (8 patients had a previous tricuspid surgery); 78.13% were in NYHA III-IV; 63.50% had moderate/severe pulmonary hypertension; 71.88% were in permanent atrial fibrillation; 32.25% had a previous permanent pacemaker. Right ventricular dysfunction was present in the 33.38%. Perioperative mortality was 23.44%. Preoperative functional class was the strongest predictor of in-hospital mortality (0% in patients in NYHA I-II; 30% in NYHA III-IV). Median follow-up duration was 42.5 months (interquartilic interval 15.4 - 68.5 months). Overall survival after one, three and five years after the procedure was 73.1%, 66.9% and 63.5% respectively. None of the patients operated in NYHA I-II died during follow-up. Late mortality was related to congestive heart failure in 38.10% of the deaths. The variables associated ($p<0.2$) with increased mortality were: previous cardiac surgery (HR=2.48; p=0.11), previous mitral valve (HR=2.89; p=0.03), glomerular filtration rate (HR 0.99; p=0.11), anaemia (HR 2.83; p=0.025), pulmonary artery pressure >40mmHg (HR 2.83; p=0.06), NYHA IV (HR 3.80; p=0.003), Logistic Euroscore I (HR 1.05; p=0.003), and tricuspid

valve replacement (*versus* repair) (HR 3.86; p=0.18). Right ventricular dysfunction, type of prosthesis (biological or mechanical) and permanent atrial fibrillation were not associated with increased mortality. The most parsimonious predictive model for mortality (lowest Bayesian information criteria) included: NYHA IV, anaemia and previous mitral prosthesis (Harrel C index=0.75). There was a marked clinical improvement after ITVS, with 78.05% of the hospital survivors in NYHA I-II during follow-up. Ten patients had to be readmitted due to congestive heart failure. Nine patients remained in NYHA III-IV. There were complications related to the tricuspid prosthesis in 10.20% of the hospital survivors: 2 thrombosis of the implanted valve (1 had to be re-operated, other medically managed) and 3 biological valves degenerated during follow-up (all of them re-operated).
CONCLUSIONS: Early surgery in isolated tricuspid valve disease is mandatory, as preoperative functional class is the strongest predictor of early and late survival. The best predictive model for decreased survival included NYHA IV, anaemia and previous mitral surgery. Despite the high perioperative mortality, hospital survivors have an acceptable long-term survival, with marked clinical improvement. These patients need a close clinical follow-up after discharge, because of the high rate of late complications related to the tricuspid prosthesis.

00124

Transatrial and transmitral approach for relief of subaortic obstruction and mitral valvuloplasty for hypertrophic obstructive cardiomyopathy with severe MR

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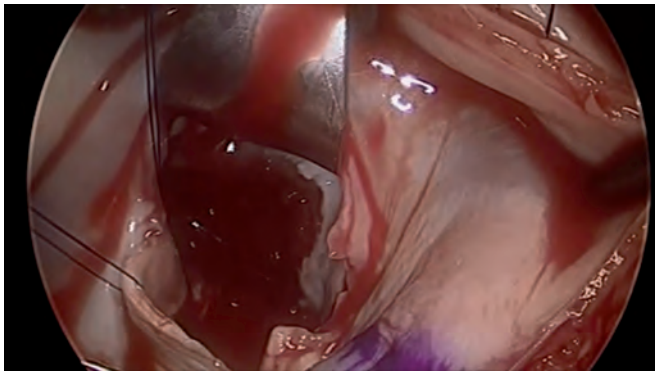
BACKGROUND: The surgical relief of subaortic obstruction in patients with hypertrophic obstructive cardiomyopathy (HOCM) has been well established with transaortic myo-myectomy. However, transaortic method has some disadvantages such as limited operative view, risk of creating late aortic valve insufficiency, and difficulties in approaching the midpoint or more distal portion of the left ventricle. Our approach can provide an opportunity for mitral valve repair and extended LV myectomy, all done through the left atrium and mitral annulus during temporaray detachment of the anterior mitral valve.
CASE REPORT: An 73-year-old lady had a diffuse type of HOCM. Echocardiogram showed systolic anterior movement of the miral valve with mitral regurgitation (mild ~moderate) with elongation of the posterior mitarl leaflet. There was little cavity at systole from the level of the pappilary muscle to the LV apex. Myectomy to the septal hypertrophied muscle close the apex was performed through the left atrium and mitral annulus with temporary detachment of the anterior mitral leaflet. This resulted in a peak LV apex-aorta gradient of 1mmHg from 130 mmHg at rest. This mitral valve was repaired with valvuloplasty and ring annuloplasty and reattchment of detached anterior mitral annulus.
A transatrial approach for resection of subaortic muscular obstruction was first reported by Lillehei and Levy through left thoracotomy under ventricular fibrillation. Our approach consisted of conventional method under cardiac arrest and temporary detachment of anterior miral leaflet through the left atrium, facilitated a wide view of subaortic and lower portion of the septum. There was no risk of structural injuries to either mitral or aortic valve or annulus. We believe that this technique may be useful for those with a samll aortic annulus and can provide an adequate operative view for those with diffuse-type HOCM with various degrees of pathological changes of the mitral valve, giving an opprtunity to perform combined procedures suitable for the variations of the anatomic and physiologic derangement.



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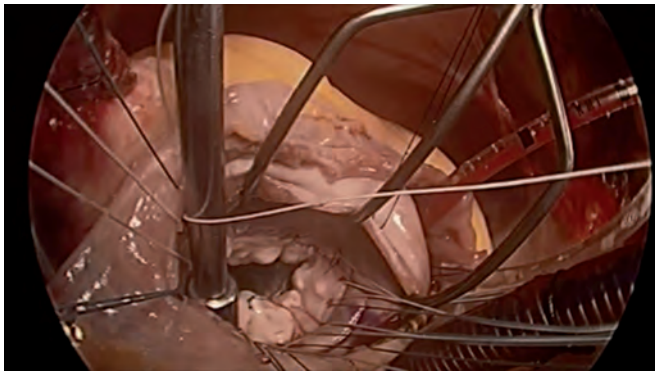

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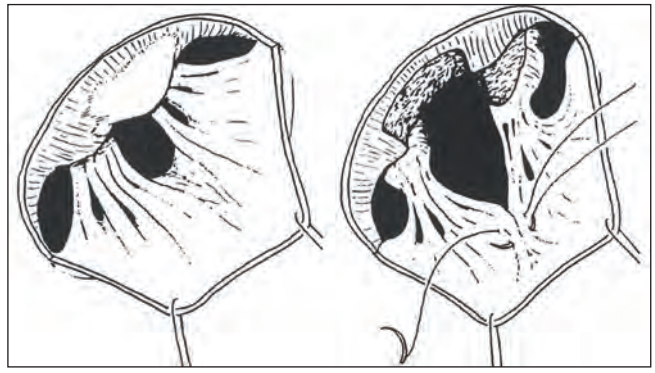

Figure 3.

00162

Right ventricular dysfunction – Echocardiographic assessment and prognostic implications in cardiac surgery

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BACKGROUND: Perioperative right ventricular dysfunction is common in patients undergoing cardiac surgery and has a major impact on clinical outcomes. The aim of our study was to assess the diagnostic tools by echocardiography and the prognostic implications of right ventricular dysfunction in adult cardiac surgery.
METHODS: We included 171 patients with left heart diseases and pulmonary hypertension, who underwent cardiac surgery. Preoperative assessment of the right ventricle function included: TAPSE (tricuspid annulus plane systolic excursion), right ventricular fractional area change (RVFAC), S wave velocity at the tricuspid ring level, using tissue Doppler. We defined right ventricle dysfunction as TAPSE < 16 mm, RFFAC < 35% and tricuspid S velocity < 11.5 cm/s. We analyzed the impact of right ventricular dysfunction on perioperative mortality and postoperative complications (pericardial, pleural, hepatic or renal);

need for reintervention, intra-aortic balloon pump or pulmonary vasodilator drugs; mechanical ventilation>24 hours; intensive care unit length of stay; postoperative inotropic support duration.
RESULTS: Mean preoperative TAPSE was 19.59± 5.79 mm. We had 2.34% mortality. Preoperative right ventricular systolic dysfunction (TAPSE < 16 mm) is associated with higher mortality rate (p 0.002), longer hospitalization in the intensive care unit (p<0.001), longer mechanical ventilation (p<0.001), prolonged need of inotropic support (p<0.001), an increased rate of renal, hepatic and pericardial complications and an incomplete and late recovery of the right ventricular function. In univariate analysis for mortality, TAPSE was significantly lower in non-survivors (13.5 ± 7.4 mm) vs. survivors (18.69 ± 4.71 mm) (p 0.03). In multivariate analysis for a composite end-point (mortality and postoperative complications), TAPSE was the only statistically significant parameter. In addition to preexistent right ventricular dysfunction, we noticed a significant postoperative decrease of TAPSE. The early postoperative phase is marked by the significant decrease of TAPSE (to 13.87± 3.13 mm, p< 0.001), with a slow and incomplete recovery up to 6 months after surgery (15.24± 3.2 mm at 1 month and 18.78± 5.21 mm at 6 months, respectively). The mechanisms of postoperative right ventricular dysfunction are multiple: perioperative ischemia, air emboli, changes in the right ventricle geometrics, harmful effects of the cardioplegic solution. Right ventricular dysfunction tends to improve over time, but not completely. This result allows us to conclude that the main determinant of the early outcomes in patients with pulmonary hypertension undergoing cardiac surgery is right ventricle adaptation to the pulmonary vascular disease rather than the absolute value of the pulmonary artery pressure.
CONCLUSIONS: A complex and careful preoperative assessment of the right heart is mandatory. Surgical interventions should be realized in the early phases, before the onset of irreversible alterations in the pulmonary circulation.

00372

Mitral valve repair in Barlow's disease: the restoration technique

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BACKGROUND: Barlow's disease (BD) has a distinctive macroscopic appearance of the mitral valve (MV), which is characterized as an advanced stage of excess myxomatous degenerative leaflets, including bileaflet prolapse, billowing, chordal elongation, and considerable annular dilation with or without calcification. BD is difficult to repair and due to its complexity MV replacement has been proposed as a method of choice for decades. However, modern surgical techniques demonstrated that MV reconstruction in BD is possible with respectable results. The aim of this prospective study is to evaluate immediate and long term results in patients with BD who received MV repair.
METHODS: Between 2010-2017, 87 patients (1.19%) underwent MV surgery due to BD. However, only 15 patients (17.24% with BD) were treated with MV repair. The procedures used in this study consist of the combination of resection-and-suture, mitral valve annuloplasty and the Alfieri stitch. All patients were operated on as elective cases. Most of the patients were male (11pts, 73.33%), with average age 55.06 years (26-74 y/o).
RESULTS: Lesions comprised annular dilatation, excess tissue, and bileaflet prolapse in all cases. The most frequent prolapsed segments were P2 and A2 (73.33%; 11pts). Repair was feasible in all cases. Immediate postoperative echocardiography showed no residual mitral regurgitation. There was no immediate posteoperative mortality (30 days). Mean follow-up was 5.9 ± 1.1 years with freedom from death 84.4 ± 0.7%, and freedom from late recurrent moderate mitral regurgitation (>2+) was 93.33% (14 pts) 6 years after surgery.
CONCLUSIONS: MV repair for BD requires comprehensive approach for each patient individually. That usually consists of multiple operative techniques and multisegment valve involvement. The surgical techniques used in this study are highly reproducible with excellent late outcomes.

00210

Follow-up results of Fontan procedure in adult patients with functionally single ventricle

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BACKGROUND: Fontan procedure is rarely performed in adults and the results are deemed to be less optimal than in children. The aim of this retrospective study is to analyze immediate and late results of Fontan completion in adult patients with complex cyanotic congenital heart defects.
METHODS: From January 1983 to December 2017, 526 patients with single ventricle physiology underwent Fontan procedure in our institution. Thirty one of them (5.9%) were older than 18 years (mean 23.6 ± 5.5 years). The diagnoses were double inlet left ventricle - 11 patients, double inlet right ventricle - 2, tricuspid atresia - 5, complex corrected transposition of great arteries - 3, visceral heterotaxy syndrome - 3, unbalanced complete atrioventricular canal - 4 and another - 3. The arterial blood oxygen saturation (SatO2) was - 79,8±5.6%, Hb - 193.3±30.6 g/l, pulmonary arterial - 368.5 ± 135.2 mm2/m2, the McGoon index - 1.8 ± 0.82, mean pulmonary pressure - 13.6±3.5 mm Hg, the ejection fraction of single ventricle was 54.5 ± 7.5% before surgery. Twenty nine patients corresponded to 3 New York Heart Association (NYHA) functional class (FC), 2 patients - 4 functional class. Fontan modifications included extracardiac conduit (n=25), atriopulmonary anastomosis (n=4) or lateral tunnel (n=2). Interval between bidirectional cavopulmonary connection and Fontan completion ranged from 1 to 19 (mean, 8.3±5.8) years. In 9 cases Fontan procedure was performed without preliminary bidirectional cavopulmonary connection.
RESULTS: Hospital mortality was 25.8% (8/31) due to multiple organ dysfunction (n=4), broncho-pulmonary hemorrhage (n=2), conduit thrombosis (n=1) and arrhythmias (n=1) and six late deaths due to congestive heart failure in 4, pulmonary embolism in 1 and conduit thrombosis in 1. Kaplan-Meier estimated survival was 52.2 % (95% confidence interval, 5.2-8.9) at 32 years. Survived patients were examined at late follow up (median 5.0 years). In 1 case recanalization of main pulmonary artery was closed, endovascular closure of large venovenous fistula in 1 patient. The SatO2 92.3 ± 4.8% (p <0.05), ejection fraction - 52.8 ± 6.9% (p>0.05), 14 patients corresponded to 1-2 FC and 1 in 3 FC NYHA.
CONCLUSIONS: Fontan completion in adult patients is challenging due to high early and late mortality. At the same time, the majority of survived patients are dwelling in 1-2 FC NYHA at late follow up.

00267

Is surgery still "gold standard" in the treatment of patients with hypertrophic obstructive cardiomyopathy?

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BACKGROUND: Surgical myectomy and transcoronary septal alcohol ablation have been successfully used to treat patients with hypertrophic obstructive cardiomyopathy (HOCM). The aim of this nonrandomized cohort study was to compare subjective and objective outcomes in HOCM pts undergoing surgical myectomy and alcohol septal ablation. -
METHODS: 237 consecutive pts with drug refractory HOCM were treated invasively (132 male and 105 female; age 49,6±8,9yrs). All pts were evaluated by cardiac catheterization. Systolic pressure gradient (SPG) on left ventricular outflow tract (LVOT) and functional mitral regurgitation (FMR) degree were assessed by echocardiography. In 102

pts with massive LV hypertrophy and its cavity obliteration and with different level of mitral regurgitation extensive myectomy with secondary chords cutting and papillary muscles mobilisation (Proff. P.Ferrazzi technique, Monza, Italy) was performed (group1).In this group oblique aortotomy was used. The first stage was the mobilization of the front and back groups of the papillary muscles of the mitral valve for improve their mobility. The 2nd stage was followed by an extensive myetomy of the anterior, mid and posterior parts of the intraventricular septum. For resection we used a two-fragment method. The third stage of the procedure was cutting of the pathological (secondary) chords of the mitral valve. In 135 pts with appropriate coronary anatomy transcoronary septal alcohol ablation was performed (group2). All patients underwent preoperative MRI planning. Initial peak LVOT gradient was 104,4±9,2 mm Hg in group1, 98,1±5,8 mm Hg in group 2.
RESULTS: We observed reducing LVOT SPG to 26,1 ±3,6 mm Hg and degree FMR (p<0,01) in short-term results after extensive myoectomy. Septal alcohol ablation in group2 brings LVOT SPG decrease to 22,5±4,1 mmHg (p<0,01). 3 (2,9%) pts had complete atrioventricular block after procedures in group 1 and 11 (8%) pts had its in group 2. The long-term results (LVOT SPG) in group 1 (mean 15 months (from 2 to 23 month)) was 32.7± 5,3 mm Hg (p<0,01). In group 2 (mean 47 months (from 3 to 82 month)) -28,7±4,6 mm Hg (p<0,01).
CONCLUSIONS: Short-term results of alcohol ablation and surgical myectomy with secondary chords resection and papillary muscles mobilisation are comparable. But surgical myectomy with secondary chords resection and papillary muscles mobilisation is safer in terms of the occurrence of complete atrioventricular block. In hemodynamic results both methods have an advantage in long-term period. Extensive myectomy with secondary chords cutting and papillary muscles mobilisation (Proff. P.Ferrazzi technique, Monza, Italy) is optimal method of surgical treatment of obstructive hypertrophic cardiomyopathy.

00217

Arch plasty of left atrium for moderate dilatation of left atrium: is it necessary?

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National Institute of Cardio-Vascular Diseases named after Amosov, Kiev, Ukraine

BACKGROUND: To determine possibillities of left atrium (LA)`s reduction by original method of arch plasty of LA (APLA) during mitral valve replacement (MVR) for isolated mitral valve disease (MVD).
METHODS: During 2005 - 2016 yy. 454 adult patients (pts) with MVD and LA`s moderate dilatation of LA (diameter of LA 50 < 60) average 57,1 ± 0,5 mm were operated at Institute. MVR were performed in all pts. There were 194 (42,7%) males, 260 (57,3%) females. Average age was 57,4 ± 6,9 yy. There were 239 (52,7%) in IY NYHA class, 186 (41,0%) in III class and 29 (6,3%) in II class. The main reason of MVD was: rheumatism (69%). Atrial fibrillation was marked in all pts. All data divided at 2 groups: group A - APLA + ligation of LA`s auriculum was 117 pts and group B - 337 pts only MVR without LA`s plasty or ligation`s auriculum were performed. All operations were used with CPB, moderate hypothermia with crystalloid cardioplegia. Cross-clamping time of aorta (minutes) were: group A - 61,1 ± 6,2 - and group B - 45,1 ± 4,3 (p< 0,05). Absence of using blood product in 64,5%.
RESULTS: The hospital mortality were: in group A - 0,9% (n=1/117) and in group B - 2,1% (n=7/337) (p<0,05). Reasons of deaths: group A - pneumonia (1pts), group B - brain damage (thrombemboli) (3 pts), heart failure (3 pts), MOF (2 pts). Sinus rhythm was restored at discharge: group A - 21,6% and group B - 5,2%(p<0,05). At the remote period (average was 9,3± 1,4 yy) 437 (93,2%) pts were followed-up. Data of echo for group A were: diameter of LA (mm) - preoperative (PRE) - 57,9 ± 0,7, postoperative (POST) - 48,3 ± 0,4, remote period (RP) - 49,5 ± 0,4; ejection fraction of LV (EFLV): PRE - 0,54 ± 0,03, POST - 0,57 ± 0,03, RP - 0,59 ± 0,02. At the remote period were marked absence of thromboembolic events and HF and sinus rhythm was occured in 13,5% pts. Data of echo for group B were: diameter of LA (mm): PRE- 57,4 ± 0,5 , POST - 55,2 ± 0,8, RP - 62,2 ± 1,1; EFLV: PRE - 0,54 ± 0,04 , POST - 0,55 ± 0,03, RP - 0,53± 0,05 . Thrombembolic events and HF were marked at remote period respectively - 4,5% and 13,2%. AF was marked in all cases.
CONCLUSIONS: The original method of APLA was allowing to improve better clinical results at group A than in B during all postoperative period (p<0,05).

00235

Less invasive surgical treatment of renal cell carcinoma extending into inferior vena cava and right atrium

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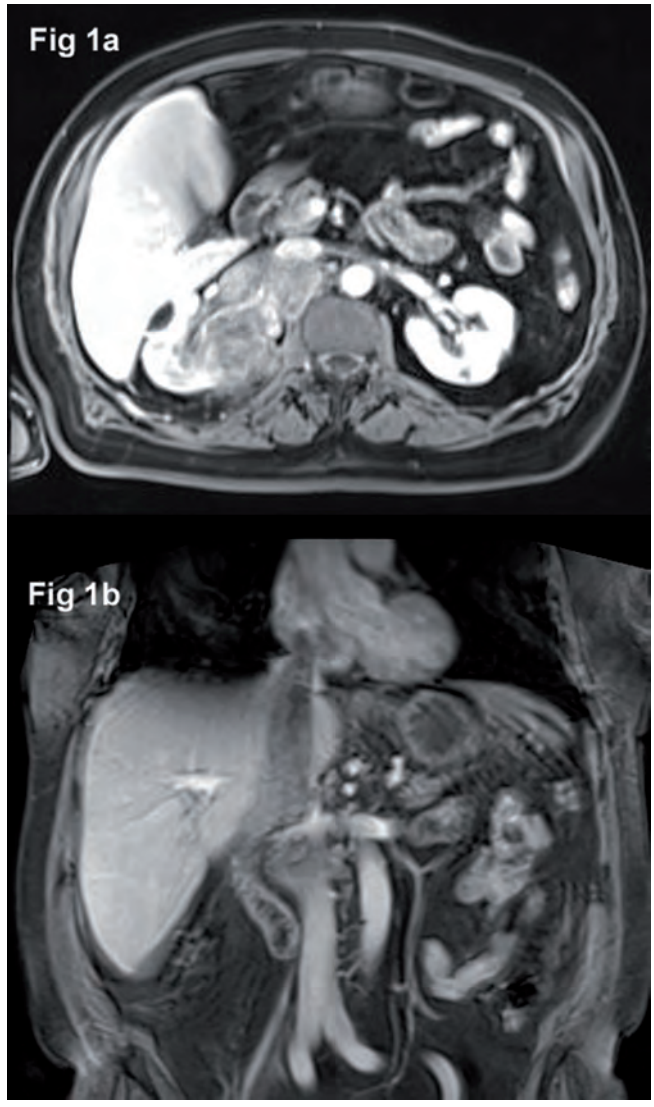
BACKGROUND: Renal cell carcinoma (RCC) has a tendency for inferior vena cava (IVC) invasion and may extend even into the right-sided cardiac chambers. In these situation, despite the advanced tumor stage, surgical resection continues to be the best chance for effective treatment. When the thrombus reaches the right atrium cardiopulmonary by-



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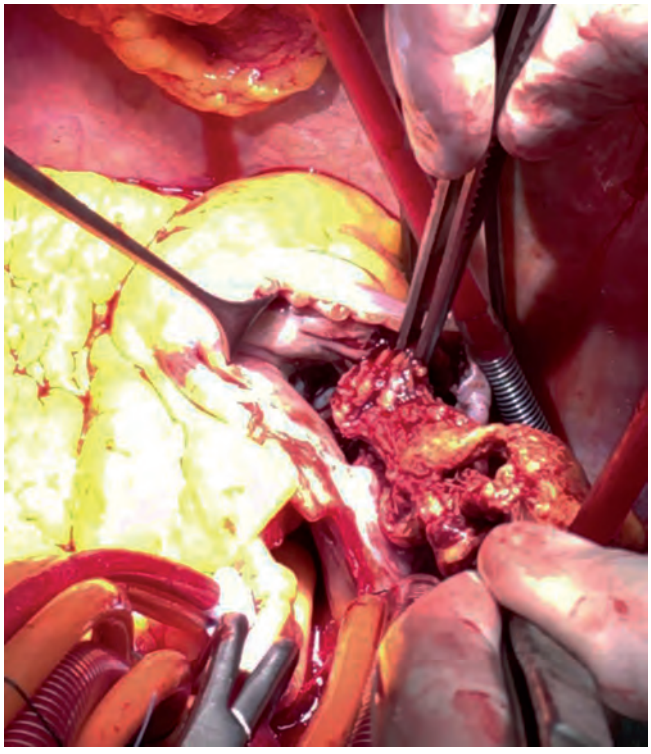

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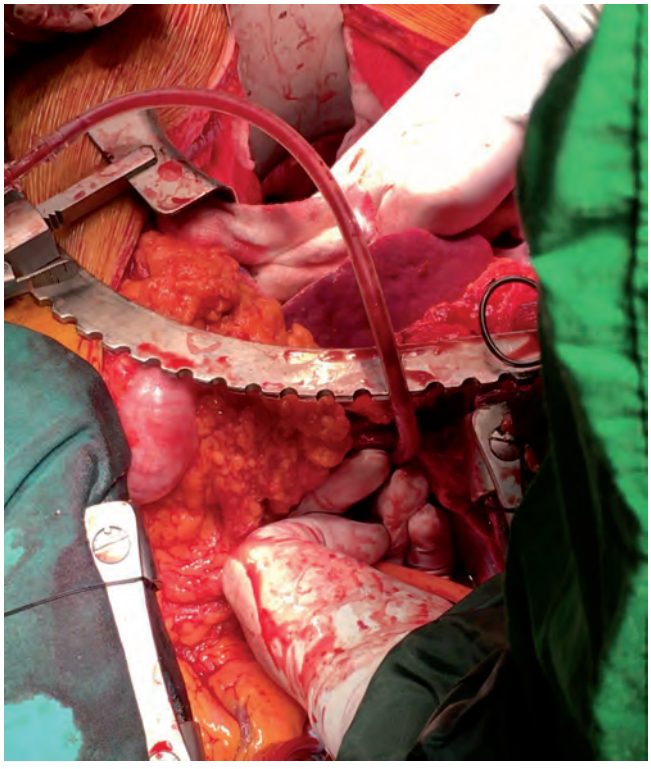

Figure 3.

pass (CPB), most frequently with deep hypothermic circulatory arrest (DHCA), has been traditionally used to obtain a bloodless surgical field from the renal veins to the right atrium to remove the tumor thrombus and to facilitate reconstruction of the IVC. Despite the potential benefits of this approach, coagulopathy secondary to hypothermia, extended surgical time and prolonged recovery have an important impact on survival, making the prognosis of this group less favorable. We present a simplified surgical approach using normothermic CPB with aortic cross clamping of the aorta and cardioplegic cardiac arrest that allows a safe tumor thrombus excision, minimizing blood loss and hemodynamic instability under safe and controlled conditions.
CASE REPORT: A 67-year-old male with a past history of hypertansion complained of worsening shortness of breath for 3 weeks. A transthoracic echocardiography showed a mass in his right atrium extending into his right ventricle through the tricuspid valve with each systole. Abdomen magnetic resonance imaging revealed a heterogeneous lobulated mass (measuring 5.5×7.0×8.0 cm) in the upper pole of his right kidney suggestive of right RCC, with tumor thrombus extended into his IVC and right atrium and was later confirmed by surgical excision and histology (Figure 1a & b). The right kidney and tumor mass were dissected with ligation of the right renal hilum. After radical right nephrectomy and lymph nodes clearance performed the patient was heparinized systemically. Venous drainage cannulae were placed in the superior vena cava (SVC) and right femoral vein which was advanced into the infrarenal IVC respectively. During the placement femoral venous canula the IVC was snared from the cavo-atrial junction and subsequently full CPB initiated. SVC was snared and right atrium was opened. The thrombus was not attached to any intracardiac structure and mobilized from the orifice of inferior vena cava above and below the liver with blunt digital dissection (Figure 2). Blunt digital dissection allows the excision of tumor inside IVC and avoids the need for inferior vena cavtomy (Figure 3). The right atrium was closed with a double layer of prolene suture, and the SVC was unsnared. He had no recurrence during the 6 months follow-up period after surgery.

SESSION: CARDIAC ABSTRACT SESSION II: CONGENITAL HEART DISEASE

TIME: 14:00-16:00
ROOM 3: STRASBOURG

00221

Chronic late systolic loading associates with adverse left ventricular hypertrophic remodeling in a porcine heart

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BACKGROUND: There are differences in the systolic loading sequences of the left ventricle, where late systolic loading if present, has pronounced effects on the active myocardial relaxation phase. This observation is based on the fact that the relaxation phase of the left ventricle starts within the late systolic phase of the heart cycle. Therefore, the purpose of this preclinical study was to investigate the interaction in chronic late systolic loading and left ventricular hypertrophic remodeling, by assessing the ventricular-arterial coupling. To address the problem, differentiation between the effects of early vs. late chronic systolic left ventricular loading lead to the creation of two experimental groups.
METHODS: Throughout left thoracotomy, seven domestic male pigs weighted 26-32 kg, underwent banding of the aorta. To induce late systolic loading, the band was position around the descending thoracic aorta at the level of the pulmonary hilum. Banding of the ascending aorta resulted in early systolic loading. At baseline and after 30 days of aortic banding, cardiac structure and function were evaluated using MRI in rest and stress, followed by invasive pressure-volume measurements of the left ventricle using Millar catheter.
RESULTS: Values are expressed as means +- SD. Aortic constriction gradients were 25+-3 mmHg in the early loaded group vs. 14+-1 mmHg in the late loaded group respectively. Baseline left ventricular pressure was 78/8+-5 mmHg. After 30 days of aortic banding, the peak left ventricular pressures in the early loaded group were 140+-5 mmHg vs.

103+-12 mmHg in the late loaded group. Aortic peak systolic pressure was 138+-8 mmHg in the early loaded group and 104+-12 mmHg in the late loaded group respectively. The differences in the timing of peak left ventricular pressure was 32+-4 ms between the groups. This was associated with development hypertrophic left ventricular remodeling, which was more pronounced in the late loaded group, whereas LVEDP (-3 +-1 mmHg) was negative.
CONCLUSIONS: Though the aortic stenosis (constriction) gradients may be nonsignificant, chronic late left ventricular loading results with ventricular-arterial decoupling represented by adverse LV hypertrophic remodeling. The timing of the peak left ventricular pressure is perhaps more important parameter than the values for the central aortic peak pressure and the aortic constriction gradient alone. These differences in the timing of the peak aortic pressure are represented accurately by the central aortic pressure waveform, derived from invasive measurements such as during catheterization procedures.

00127

Myocardial bridging and its clinical significance: a meta-analysis of 133,380 subjects

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[1]Department of Anatomy, Jagiellonian University Medical College, Krakow, Poland; [2]International Evidence-Based Anatomy Working Group, Krakow, Poland; [3]First Faculty of Medicine, Charles University in Prague, Prague, Czech Republic; [4]2nd Department of Cardiovascular Surgery, First Faculty of Medicine and General University Hospital in Prague, Charles University, Prague, Czech Republic; [5]Faculty of Medicine and Surgery, University of Cagliari, Sardinia, Italy; [6]Department of Anatomical Sciences, St George's University, Grenada, West Indies

BACKGROUND: The clinical significance of myocardial bridging (MB) remains unclear. We performed a meta-analysis to assess the prevalence of MB in healthy adults as well as patients suffering from cardiovascular disorders.
METHODS: We searched for studies published in all languages until February 2017 were retrieved from electronic database searches. Pooled prevalence was estimated with random-effects models. Subgroup analysis was conducted to assess variation of MB rates across diagnostic methods and disease types. Further, odds of prevalence among healthy and cardiac patients was compared. Publication bias was evaluated using Egger's test, and Trim and Fill method.
RESULTS: Sixty-eight observational studies were identified that reported data on 133,380 subjects. The pooled prevalence estimate (PPE) of MB in healthy subjects was 28.2% (17 studies). The PPE of MB in patients with suspected or confirmed cardiac conditions was 16.2% (57 studies), whereas 20.35% of diagnostically confirmed cardiac patients had MB. Subgroup analysis showed that 30% of myocardial infarction patients and 30.6% of hypertrophic cardiomyopathy patients had MB. The lowest prevalence was reported in aortic valve stenosis patients (5.3%; one study). Pooled analysis of seven studies showed that the odds of MB were significantly higher in patients with cardiac disease than healthy subjects (OR 2.17, 95% CI 1.08-4.39, p = 0.00). An autopsy revealed MB in 43.9% of subjects, coronary arteriography in 10%, computed tomography coronary angiography in 29%, and cineangiogram in 9.7%. The length of MB between asymptomatic (637 subjects; 1.87±0.27 cm) and symptomatic (3590 subjects; 1.99±0.08 cm) subjects was statistically similar (t=0.54; p=0.59). However, the depth of MB was significantly lesser (t=2.22; p=0.03) in asymptomatic (460 subjects; 0.051±0.10 cm) subjects than the in symptomatic (1101 subjects; 0.21±0.02 cm) subjects.
CONCLUSIONS: Myocardial bridging was more prevalent in healthy subjects than in subjects with any cardiac condition. MB detection rates vary with different diagnostic methodss. The depth of the MB may relate to the symptomatic condition. We conclude that MB is a common anatomical anomaly that remains insignificant in the general population.

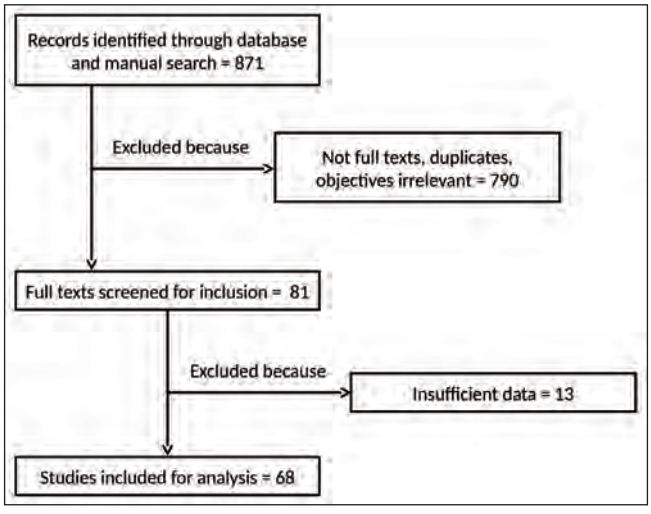

Figure 1.

00294

Heart transplantation in failing Fontan circulation

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BACKGROUND: In univentricular hearts the separation of the pulmonary and the systemic circulation resulting in the Fontan circulation (total cavo-pulmonary connection) is the treatment of choice. However, even after the "perfect" Fontan operation, survival decreases over time. The main problems in long-term are: myocardial failure of the single ventricle, arrhythmias, and protein-losing enteropathy. Over the years, an increasing number of these patients may require heart transplantation. However, the indication for heart transplantation also depends on anatomical and technical issues due to numerous previous surgeries making the procedure less feasible and very demanding.
METHODS: In a retrospective study we analyzed the data of patients with failing Fontan circulation (failing-Fontan; n=6) who underwent heart transplantation in a 10-year period (between 2007 and 2016). The data were compared with a similar-size group of adult patients with dilative cardiomyopathy (DCM; n=7) who underwent surgery in the same time period by the same main surgeon. Data are presented in mean values ± standard deviation. Statistical analysis was performed using Student´s t-test. P-values <0.05 were defined as statistically significant.
RESULTS: At heart transplantation, the patients with failing-Fontan circulation were younger (39.5 ± 13.4 years in failing-Fontan vs. 44.1 ± 11.3 years in DCM) but the difference was not statistically significant. The total ischemic time of donor hearts was comparable in both groups (222.8 ± 57.8 min in failing-Fontan vs. 186.6 ± 38.1 min in DCM). However, the heart transplantation in failing-Fontan patients was more complex resulting in a total duration of surgery of 779.2 ± 164.3 min (vs. 409.3 ± 113.7 min in DCM; p<0.0001). Nevertheless, the duration of complete anastomoses of transplanted hearts was comparable in both groups without reaching statistical significance (89.4 ± 40.8 min in failing-Fontan vs. 80.2 ± 17.5 min in DCM). In failing-Fontan group, one patient needed extracorporeal mechanical support (ECLS) after transplantation and 2 patients in DCM group.
CONCLUSIONS: Heart transplantation in failing Fontan circulation is a complex and very demanding surgery due to anatomical variables of heart recipients. Many technical difficulties due to previous surgeries increase complexity of these procedures. Therefore, the key of success is the planning of the procedure for reducing ischemic time of the donor heart. However, the duration of the heart transplantation in the failing Fontan patients was the double of the procedure in patients with dilative cardiomyopathy.

00142

Preventive tricuspid annuloplasty in adult patients with septal heart defects

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BACKGROUND: The aim of the research is an evaluation of results of the preventive tricuspid annuloplasty in adult patients with septal heart defects.
METHODS: The analysis was based on results of the 270 operated patients from 2011 till 2016. The age varied from 15 till 67 years (average age 24,5 years). 168 patients suffered from atrial septal defect. 77 patients had ventricular septal defect. 12 patients had anomalous pulmonary venous drainage, while 13 had atrioventricular septal defect. In 91 patients a heart defect was combined with tricuspid valve insufficiency of the I – II degrees and pulmonary arterial hypertension from 36 mm per mercury till 72 mm per mercury (average 52,6 mm per mercury).
RESULTS: Congenital heart malformations, such as atrial septal defect, ventricular septal defect, partial anomalous pulmonary venous return, atrioventricular septal defect in natural course are initially complicated by development of the hypervolemia in pulmonary blood circulation. Firstly, it leads to functional spasm of the pulmonary arteries, arteriols and precapillary vessels, being managed by use of spasmolytics. Further, it leads to stable spasm of pulmonary arteries and their sclerosing, expressed in development of the secondary pulmonary hypertension. With aging the pulmonary hypertension results in dilation of right heart chambers with their hypertrophy. Dilated right heart chambers stretch the fibrous ring of the tricuspid valve that results in development of the valvular regurgitation and relative tricuspid insufficiency. The closure of atrial septal and ventricular defects contributes the decrease in hypertension in pulmonary blood circulation and the secondary pulmonary hypertension respectively that gradually diminishes the sizes of right heart chambers and tricuspid valve insufficiency respectively. Simultaneous closure of the atrial and ventricular septal defects in combination with tricuspid valve annuloplasty, squeezing the fibrous ring and liquidating valvular insufficiency promote more active decrease in sizes of right heart chambers and reduction of secondary pulmonary hypertension respectively. The septal defects were closed with patches from autopericardium, xenopericardium or Goretex on-pump. 91 patients underwent tricuspid annuloplasty using De Vega or Boyd technique, 18 patients - suture technique of the tricuspid annuloplasty. We have noticed that patients of older age (11 cases) which did not undergo tricuspid annuloplasty (the fibrous ring was not dilated and a good co-optation of cusps was saved in hydraulic testing) in postoperational period went back with progressive tricuspid valve insufficiency of the I-II degree. That was associated with residual pulmonary arterial hypertension which was characterized by dilated right heart chambers and dysplasia of the connective tissue in congenital heart malformations. Therefore we started to carry out the preventive tricuspid annuloplasty to all patients (46 cases).
CONCLUSIONS: Thus, in recent years, we perform the preventive tricuspid annuloplasty in combination with septal defects closure to all adult patients. That does not allow to progress the tricuspid valve insufficiency in postoperational period and increases the quality of a patient's life respectively.

00161

Long-term results of tricuspid valve replacement with bioprosthesis in patients with congenital heart defects

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BACKGROUND: Evaluate long-term results of tricuspid valve (TV) replasement in patients with congenital heart defects (CHD); identify factors associated with the longevity of the bioprosthesis.
METHODS: From 2000 till 2015, 192 underwent TV replacement with biological prosthesis. 49.2% (n=95) females, 50.8% (n=97) males. Mean age was 17.6±7.3 (5-48) years, according to transthoracic echo all had TV regurgitation of III-IV degree. Mean TV annular diameter was 45.7±1.7 mm, cardiothoracic ratio was 62.7±3.2% (52-73). According to type of valve used all patients were divided into three groups: 1st group (n=52) - valve made of bovine glisson ("Biogliss"), 2nd and third group (n=66 and 77) - xsepericardial valve with different anticalcium treatment ("Biolab" & "Bionix"). At discharge all valves were in normal functional status, with no regurgitation and peak diastolic gradient 4.2±0.2 mm Hg.
RESULTS: Mean follow-up was 9.6±3.6 years (1-16), mean age at follow-up was 25.9±9.7 years. In first five years after surgery all prosthesis were found to be in normal condition with no signs of stenosis or regurgitation. Peak gradient was 3.8±1.4 mm Hg (2-7), all patients were in I-II New-York heart association (NYHA) functional class, there was one reoperation in each group: infective endocarditis in the 1st group, and prosthesis frame fracture in 2nd and 3rd. in longer follow-up (6 to 15 years) in the 2nd and 3rd group the frequency of prosthesis dysfunction was significantly higher compared to the 1st group. Signs of valve dysfunction were regurgitation of III grade and mid-diastolic gradient over 9 mm Hg, Reoperation freedom in 5 years after surgery for the 1st group was 95%, in 10 years 86% and in 16 years – 81%, for the 2nd & 3rd group reoperation freedom was 88%, 70% and 52% respectively. Freedom from prosthesis dysfunction for the 1st group was 86% in 5 years, 62% in 10 years an 48% in 16 years. In the 2nd & 3rd group dysfunction freedom was for the same interval 72%, 50% and 36%. In total 53 patients needed reoperation, indications for redo surgery were patient/prosthesis mismatch, infective endocarditis, prosthesis calcification. It was noted, that patients operateted in the age less 12 years with small sized prosthesis are significantly more prone to early degeneration.
CONCLUSIONS: Factors affecting longevity of biological valves in TV position is an early age leading to early patient/prosthesis mismatch development, infective endocarditis, type of valve used, and the size of the prosthesis.

00057

Surgical results for obstructed total anomalous pulmonary venous return in a single institution

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BACKGROUND: Total anomalous pulmonary venous return (TAPVR) is a rare disease with the approximate ratio from 1% to 3% of children born with congenital heart defect. Obstructed TAPVR has been recorded in the literature range from 25,5% up to 79,5% and still remain as a risk factor for surgical mortality and morbidity. Surgical repair for obstructed TAPVR is challenge, especially for small children and neonate, with early mortality up to 39,5%. The purpose of this study is evaluate the mid-term outcome after surgical repair for obstructed TAPVR in a single institution from low- and middle-income country.
METHODS: The medical records of 86 patients underwent surgical repair for obstructed TAPVR from March 2011 to May 2017 was reviewed. Single ventricle physiology with TAPVR was not included in this study. The pulmonary venous connection was 44 patients with supracardiac (51,2%), 20 patients with infracardiac (23,4%), 15 with intracardiac (17,4%) and 7 patients with mixed (8%). The position of the obstructed pulmonary vein was 58 patients with vertical vein (67,4%), 23 patients with small PFO (26,7%), 2 patients with hypoplasia of the peripheral pulmonary vein (2,3%) and 3 patients with multilevel obstruction (3,6%). The median age was 64,2 days (range, 1-540 days) and the median weight was 3,9 kg (range, 1,7-8 kg). There were 38 patients required ventilator support before operation, with 20 patients admitted with cardiogenic shock.
RESULTS: There were 9 (10,5%) hospital dead and 2 late dead (2,3%). Five patients (5.8%) required reoperation for pulmonary stenosis with the median time from the fist operation was 3.4 months (range 2-9 months). The median aortic cross-clamp time was 62,98 ± 24,11min (range, 17-154min) and the bypass time was 111,87± 42,58 (range, 32-270min). 25 patients has been used circulatory arrest with median

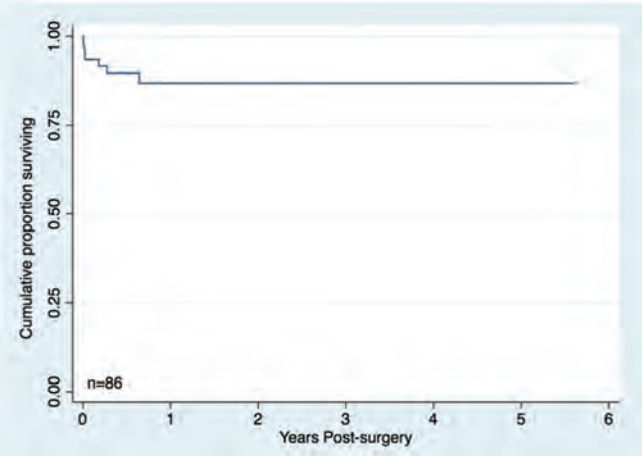

Figure 1.

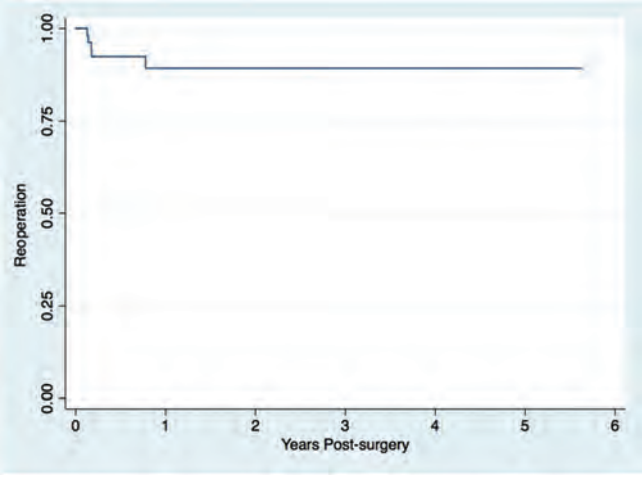

Figure 2.

time was 5,71 ± 10,48min. The sutureless technique has applied for 39 patients. The vertical vein has been ligated for 21 patients. 17 patients required atrial pace maker in the early phase of post-operative period, 7 patients required sternum open. The median pressure gradient across through the anastomosis is 4,77 ± 5,48mmHg (range, 1-27mmHg). By multivariable regression analysis, nosocomial infection and acute renal failure required peritoneal dialysis were found to be associated with surgical mortality (p= 0.001 and p=0.003). However, no risk factor was found to be associated with reoperation.
CONCLUSIONS: Hospital mortality after obstructed TAPVR repair is associated with nosocomial infection in low- and middle-income country. However, survival can achieve excellent outcome with limiting resource.

00131

Results of aortic valve replacement in children with congenital aortic valve stenosis

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BACKGROUND: To estimate immediate and mid-term results of aortic valve (AV) replacement in children with congenital AV stenosis.
METHODS: Retrospective review of 104 consecutive patients aged 5 to 15 years with congenital AV stenosis and no significant AV insufficiency operated in 2007-2010. According to age, all patients were divided into two groups: 1st (n=27)- children aged ≤10 years, 2nd - children aged >10 years. (n=77). Mean age was 8.4±1.8 and 13.4±1.2 years. Peak systolic gradient was 75.5±22.4 and 74.5±23.0 mm Hg (p=0.143). AV annular diameter was 19.9±2.8 and 21.6±3.1 mm. In the 1st group balloon valvuloplasty was previously performed in 7 patients (25.9%), and AV reconstruction in 2 (7.4%). In the 2nd group, 9 patients (11.7%) had valvuloplasty and 4 (5.2%) patients had AV reconstruction. Mean interval after procedure was 6.1±2.4 and 9.2±2.6 years respectively. All surgery was performed according to standard protocol with cardiopulmonary bypass and moderate hypothermia. Aortic annulus enlargement technique was carried out 18 patients (66.7%) of the 1st group, and in 35 patients (45.5%) of the 2nd group. Mechanical valves were used in all patients. Mean size of the implanted prosthesis 21±2 mm, and 22±1 mm (p=0.001), valve orifice to body surface area (BSA) ratio was 2.3±0.5 and 1.7±0.3 (p=0.0001).
RESULTS: In-hospital mortality was 11.1% (n=3) in the 1st group and 2.6% (n=2) in the 2nd (p=0.0001). the reason of adverse outcome was acute heart failure. Non-lethal complication in both groups was mostly pericardial effusion. Mean in-hospital stay (after surgery) was 16.7±9.6 and 13.2±5.6 days (p=0.09). peak gradient at discharge was 18.1±5.1 and 22.0±8.6 mm Hg. In both groups factors associated with higher gradients were tilting-disk type valve and low valve/BSA ratio. Follow-up was complete in 52% (n=14) and 51% (n=40) of cases. Median follow-up time was 3.5 (2-10) and 2.5 (0.5-11) years. There were no late deaths. Cumulative freedom from reoperation in 5 years was 100% in the 1st group and 66% in the second group (p=0.001). In 10 years - 50% and 49% respectively (p=0.09).
CONCLUSIONS: Implantation of mechanical prosthesis in children with congenital AV stenosis in accompanied by an acceptable immediate outcome. In children less than 10 years significantly higher level of in-hospital mortality is observed. Low prosthesis/BSA ratio is a risk factor for reoperation within 5 years after surgery. Probably 50% of patients regardless of age would require reoperation in 10 years after surgery.

00340

Early results of surgical intervention in pediatrics with Shone's anomaly

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BACKGROUND: The results of surgery in children with Shone's anomaly is generally poor. We reviewed our results and outcomes in patients with staged repair for left ventricular outflow tract obstruction (LVOTO) and mitral valve reconstruction.
METHODS: Thirty-five children underwent staged repair for Shone's anomaly between 2003 and 2016. The first operation was done with a mean age of 11 months (range, 21 days to 5 years). All patients had mitral stenosis; with supravalvular mitral ring (n = 13) Mitral valve abnormalities including parachute mitral valve, fused chordae, single papillary muscle (n = 12). The LVOT obstruction features included subaortic stenosis (n = 19), valvar aortic stenosis (n = 12), bicuspid aortic valve (n = 29), and coarctation (n = 21). All the 35 patients underwent 98 surgical procedures, including 27 mitral operations and 54 LVOT operations.
RESULTS: There were two operative deaths at the first operation. Mean follow-up was 4.5 ± 4.1 years (range, 5 months to 14 years). There were four late deaths (11.4%). Three of them were secondary to severe mitral valve disease and one after repeated LVOTO intervention. Overall 14-year actuarial survival was 85%. All surviving patients are in New York Heart Association functional class I or II.
CONCLUSIONS: A favorable outcome is possible for most cases with shone complex. Operative mortality is adversely affected by the severity of mitral valve disease, the degree of left ventricular hypoplasia, and the need for multiple operative procedures.

SESSION: BEST VASCULAR POSTER SESSION

TIME: 14:00-16:00
ROOM: 4

00222

An isolated aneurysm of the abdominal aorta in a patient with Marfan's syndrome: a case report

P. Mutavdzic [1], M. Dragas [1, 2], B. Kukic[1], K. Stevanovic[1], I. Koncar [1, 2], I. Tomic [1], R. Trailovic [1], L. Davidovic [1, 2]

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BACKGROUND: Marfan's syndrome (MFS) represents a multisystem connective tissue disorder and among a number of manifestations of this disease, the cardiovascular disorders are considered as the most significant, since they might lead to catastrophic consequences. We present a case of successful management of isolated symptomatic abdominal aortic aneurysm (AAA) in a young patient with MFS. We present a case of successfully treated abdominal aortic aneurysm in a 24-year old patient with Marfan's syndrome. Following initial physical and ultrasound examination, the multislice computed tomography scan revealed infrarenal aortic aneurysm of 6 cm in diameter, 10 cm long, along with slightly dilated iliac arteries. However, dimensions of aortic root, aortic arch and descending suprarenal aorta were within normal limits. Further on, since the patient presented with signs of impending rupture, an urgent surgical intervention was performed. The patient was discharged in good general medical condition 7 days following surgery. After 6 months of follow-up, the patient's condition was satisfying and no MSCT-signs of further aortic dissection/aneurysm were identified. To the best of our knowledge a case of successful management of a patient with Marfan's syndrome and truly isolated infrarenal and symptomatic abdominal aortic aneurysm has not been described in the literature before.
CASE REPORT: A 24-year old female patient, a professional volleyball player, was admitted to the Emergency Center, Clinical Center of Serbia, due to continuous and increasing pain in the abdomen that started a few hours ago. Physical examination on admission revealed a pulsatile palpable mass in the abdomen. Following ultrasound examination, the multislice computed tomography scan (MSCT-scan) was performed and revealed infrarenal aortic aneurysm of 6 cm in diameter, without CT signs of thrombosis, dissection or rupture. However, dimensions of aortic root, aortic arch and descending suprarenal aorta were within normal limits. The patient was urgently transferred to the Clinic for Vascular and Endovascular Surgery, Clinical Center of Serbia for AAA repair. Intraoperative aortic findings were indicative for MFS (thin arterial wall without hematoma, or intramural thrombus) and further histopathological examination confirmed marked fragmentation, cystic medial necrosis, disruption and disappearance of elastic fibers into the media of arterial wall. We performed aorto-bi-iliac by-pass using a 16x8 mm Dacron bifurcated graft. Postoperative course was uncomplicated, so on the 7th postoperative day, the patient was discharged, in good general medical condition.
CONCLUSIONS: In conclusion, since isolated AAAs in MFS patients are rare, more similar reports are needed in order to establish its clinical characteristics. This case highlights the fact that truly isolated infrarenal and symptomatic abdominal aortic aneurysm may occur in patients with Marfan's syndrome and in such cases a timely recognition and prompt surgical interventions are of crucial importance.

00188

Aortic neck remodeling 12 months after endovascular aneurysm repair with the Ovation endograft

N. Kontopodis [1], A. Kafetzakis [1], C. Chronis [1], E. Tavlas [1], N. Daskalakis [1], N. Galanakis [2], N. Mathaiou [2], D. Tsetis [2], C. Ioannou [1]

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BACKGROUND: Endovascular treatment (EVAR) of abdominal aortic aneurysms (AAAs) is becoming increasingly popular, currently being the preferred treatment modality. Remodeling of the aortic neck following EVAR is an important factor that may affect the durability of the method, since it is critical to sustain proximal sealing and therefore successful exclusion from systemic pressurization. Besides the traditional mode of proximal sealing and fixation exploiting the radial force of self-expanding stents, other modes have been recently introduced. We aim to record aortic neck remodeling at 12-months follow-up in patients undergoing EVAR with the OVATION endograft, a device that encompasses an original 2 polymer filled O-rings to achieve proximal sealing.
METHODS: This is a single-institution retrospective, descriptive observational study which included 50 consecutive patients who underwent EVAR with the use of the Ovation endograft. The patients had to have completed at least 12 months of follow-up. For the analysis the pre-operative, the 1-month post-operative and the 12-months post-operative CT scan were taken into account. Several parameters that characterized the aortic neck anatomy were recorded like neck diameter, juxta-renal and supra-renal angles, neck length, as well as aortic diameter at 5mm, 15mm, 25mm and 35mm suprarenally at these 3 timepoints. AAA maximum diameter was also recorded. Clinical outcome in terms of endoleaks and/or migration was evaluated. All measurements were performed by the same observer at the Osirix workstation. Statistical comparisons were performed with the use of the Wilcoxon rank sum test.
RESULTS: The implantation of the Ovation endograft initiates changes in the aortic neck anatomy. Changes in the diameter and lengths may be statistically significant but are very small to be considered clinically relevant, as is the case with aortic neck length. On the other hand a significant reduction of the juxta-renal angulation was observed.
CONCLUSIONS: Overall the adverse events related to aortic neck (migration, Type Ia endoleak) were very rare. Long-term follow-up of these patients is needed in order to evaluate relevance of these findings.

00223

Treatment of pseudoaneurysm in proximal anastomosis after aortic surgery using parallel stents - ChEVAR – a case report

P. Mutavdzic [1], I. Koncar [1, 2], V. Cvetic [1, 2], M. Dragas [1, 2], N. Jakovljevic [1], M.Sladojevic [1], L. Davidovic [1, 2]

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BACKGROUND: The chimney technique (chEVAR) was originally described as an adjunctive salvage procedure to treat unintentionally covered branch vessels. In last time this technique play a important role for unsuitable anatomic candidates for standard endovascular aortic aneurysm repair (EVAR). We present a case of successfully treated a 76-year-old patient with the pseudoaneurysm in the region of anastomosis between the previously implanted synthetic aortic graft and lower mesenteric artery. The patient underwent emergency surgery due to ruptured aneurysm of the abdominal aorta in our institution, seven years ago, when reconstructed by a synthetic graft - aorto- right iliacal - left femoral with reimplantation of the lower mesenteric artery. Since the patient at the last control complained of severe back pain, control MDCT examination was performed and showing the existence of large pseudoaneurysm in region between the synthetic graft and reimplanted AMI. Given the very serious cardiac comorbidity of the patient and his age, the patient was unacceptably high risk for a classic open surgery. The vascular consilium decided to try endovascular aortic procedure using parallel stents - ChEVAR method. First, the cover stent was implanted in the lower mesenteric artery and parallel to it the endovascular stent-graft in the dacron graft. The procedure was performed without complications with a regular control angiographic finding. The patient was discharged in good general medical condition 7 days following endovascular treat-

ment. After one months of follow-up, the patient's condition was satisfying and MSCT finding was correct.
CASE REPORT: A 76-year-old patient underwent emergency surgery due to ruptured aneurysm of the abdominal aorta in our institution, seven years ago, when reconstructed by a synthetic graft - aorto- right iliacal - left femoral with reimplantation of the lower mesenteric artery. Since the patient at the last control complained of severe back pain, control MDCT examination was performed and showing the existence of large pseudoaneurysm in region betwen the synthetic graft and reimplanted AMI. Given the very serious cardiac comorbidity of the patient and his age, the patient was unacceptably high risk for a classic open surgery. The vascular consilium decided to try endovascular aortic procedure using parallel stents - ChEVAR method. First, the cover stent was implanted in the lower mesenteric artery and parallel to it the endovascular stent-graft in the dacron graft. The procedure was performed without complications with a regular control angiographic finding. The patient was discharged in good general medical condition 7 days following endovascular treatment. After one months of follow-up, the patient's condition was satisfying and MSCT finding was correct.
CONCLUSIONS: ChEVAR can be completed with a high degree of success; however, perioperative complications including loss of chimney patency and endoleak, may occur at a higher rate than standard EVAR. Elective use of chEVAR should be performed with caution, and needed to determine long-term efficacy of this technique.

00316

Transient acute leg ischemia in a professional athlete caused by isolated popliteal artery dissection mimicking popliteal entrapment syndrome

P. Mutavdzic [1], N. Jakovljevic [1], P. Zlatanovic [1], M. Sladojevic [1], M. Dragas [1, 2], I. Koncar [1, 2], L. Davidovic [1, 2]

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BACKGROUND: Exertional leg pain includes a broad range of conditions induced by different vascular, muscu-loskeletal, and neurological disorders. We report a case with isolated popliteal artery dissection as a cause of a transient acute lower limb ischemia. We report a patient with popliteal artery dissection which occurred during squatting exercise. After initial signs of transient acute limb ischemia, physical and ultrasound examination pointed to entrampment syndrome as a likely cause. However, digital subtraction angiography showed possible dissection of popliteal artery, which was confirmed intraoperatively. Popliteal artery was resected and reversed saphenous vein bypass was performed. Isolated popliteal artery dissection in professional athletes is a rare entity, which can be manifested with exertional leg pain. Clinical findings can sometimes be similar to those of popliteal entrapment syndrome. Clinical suspicion and timely patient referral to a vascular specialist are crucial for optimal treatment of this limb-threatening condition.
CASE REPORT: We report a case with isolated popliteal artery dissection as a cause of a transient acute lower limb ischemia. We report a patient with popliteal artery dissection which occurred during squatting exercise. After initial signs of transient acute limb ischemia, physical and ultrasound examination pointed to entrapment syndrome as a likely cause. However, digital subtraction angiography showed possible dissection of popliteal artery, which was confirmed intraoperatively. Popliteal artery was resected and reversed saphenous vein bypass was performed.
CONCLUSIONS: Isolated popliteal artery dissection in professional athletes is a rare entity, which can be manifested with exertional leg pain. Clinical findings can sometimes be similar to those of popliteal entrapment syndrome. Clinical suspicion and timely patient referral to a vascular specialist are crucial for optimal treatment of this limb-threatening condition.

00281

Acute aortic syndrome in abdominal aorta: detection and management

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BACKGROUND: The acute aortic syndrome (AAS) is a life-threatening condition that includes severe acute aortic lesions. However, this term is being applied only for thoracic aorta lesions conventionally. Can we observe all the same typical signs of AAS in abdominal aorta as well? And if yes, which management tactic should be considering as optimal for such cases. The aim of this study was a comparison of radiologic and clinical signs of AAS both in thoracic and abdominal aorta and an evaluation of single-center experience in treatment.
METHODS: 127 atherosclerotic patients with clinically symptoms (chest, back or abdominal pain, malperfusion, limp ischemia) associated with aortic lesions were examined by ultrasonography and CT angiography. The typical radiologic signs of AAS were being searched. The identity of lesions and correlation between clinical and morphological manifestation were being studied. The majority of the patients (72.4%) underwent an open or endovascular repair, including of 80.0% of patients with lesions of abdominal aorta, and following morphological study in selected cases.
RESULTS: The typical signs of AAS in thoracic aorta were revealed in 67 patients, including aortic dissection DeBakey's type I and III in 40.3%, penetrating aortic ulcer (PAU) in 37.3% and intramural haematoma (IMH) in 22.4%. 60 patients had a presentation of the lesions in the abdominal aorta. All kinds of typical signs of AAS were detected. PAU was revealed most often in 65.0%, 28.2% of them with rupture (fig. 1), 46.2% with saccular "daughter" aneurysm without signs of retroperitoneal haematoma and 25.6% without ruptur or protrusion. IMH was detected in 18.3%, and isolated local dissection of abdominal aorta with involving of iliac atreies in 16.7% (fig. 2). 48 patients with "abdominal" AAS underwent a repair. 21 EVAR and 27 open procedures were performed. 6 patients (10.0%) died: five due to postoperative complication and one intraoperatively as a result of wall disruption in whole aorta up to arch. The morphological findings had borne evidence of identity of lesions.
CONCLUSIONS: We expect the atherosclerotic lesions of aortic wall are similar both in thoracic and abdominal aorta, as a matter of obtained data. Therefore, in our opinion, the radiologic and clinical findings of this type in abdominal aorta should be a reason for an invasive therapeutic approach and a AAS guidelines following.

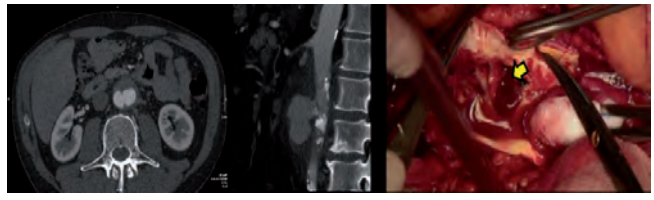

Figure 1.

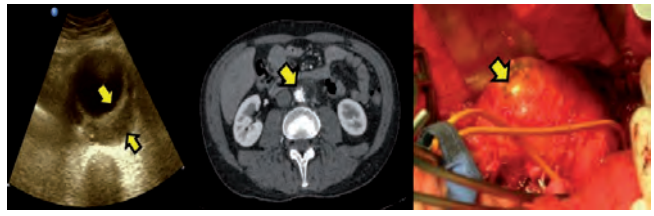

Figure 2.

00389

Hybrid strategy in critical limb ischemia patients with multilevel atherosclerotic lesions

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BACKGROUND: Patients with critical limb ischemia (CLI) are at increased risk for limb loss with amputation rates as high as 50% if left untreated. Despite recent advances in perioperative care and anesthetic techniques, extensive revascularization procedures in this patient group carry high perioperative morbidity and mortality.
METHODS: We have used hybrid (endovascular and open surgery) procedures in patients with multilevel atherosclerotic lesions in critical limb ischemia. On a one year consecutive series, from 197 patients with revascularisation for critical ischemia, 71% were operatid classically (by-pass surgery), 21% received endovascular interventions and 8% hybrid procedures. For the iliac stenosis or short oclusions we have used autoexpandable stents. In 41 cases we have done proximal femuropopliteal bypass and in 58 cases we have performed distal femuro popliteal bypass. As type of graft used 53% were autologouis veins,26% were synthetic grafts; we have used Miller cuff in 16% of cases and in 5% composite grafts.
RESULTS: The technical and hemodynamic success rates were 95% for the combined treatment. The perioperative mortality rate was 2%
The follow up was between 1 and 24 months with an average of 12 months, by echo doppler examination. In conclusion, hybrid lower extremity revascularization procedures can be used to treat CLI with low perioperative morbidity and mortality and good immediate and midterm patency and limb salvage, thus providing an attractive alternative to larger open surgical interventions.
CONCLUSIONS: In conclusion, hybrid lower extremity revascularization procedures can be used to treat CLI with low perioperative morbidity and mortality and good immediate and midterm patency and limb salvage, thus providing an attractive alternative to larger open surgical interventions

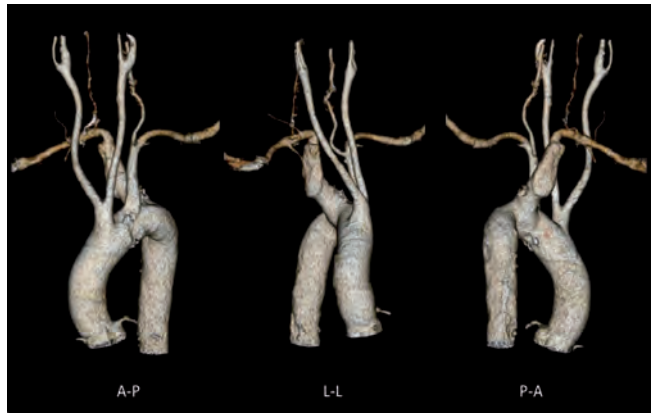

Figure 1.

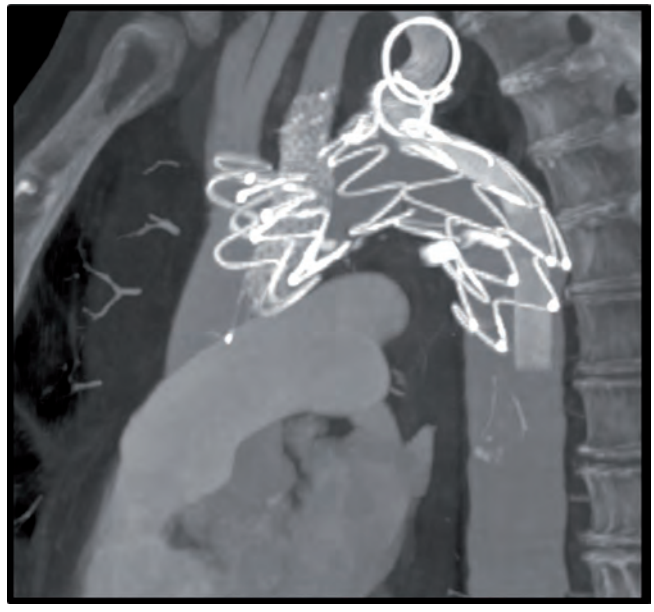

Figure 2.

00207

The chimney/periscope technique as total endovascular treatment of a Kommerell's diverticulum in a left-sided aortic arch with aberrant right subclavian artery

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BACKGROUND: Kommerell's Diverticulum (KD) is defined as an arterial dilatation of the origin of an aberrant artery arising from the descending aorta. This congenital anomaly may predispose to aneurismatic evolution, dissection, rupture, or compression of adjacent structures. For this reason, surgical repair is advocated even in asymptomatic patients: preventive treatment is indicated in particular in cases with a diverticulum size > 5 cm and/or aberrant subclavian artery orifice diameter> 3cm. We report the first case of KD in the setting of a left-sided aortic arch successfully treated with a total endovascular approach, maintaining supra-aortic trunks patency, using off-the-shelf devices.
CASE REPORT: The technique is demonstrated in a 75 years-old female with chronic obstructive pulmonary disease (COPD) in long term outpatient O2 therapy. An angioCT scan demonstrated the presence of an aneurysmatic KD of a right aberrant subclavian artery (ARSA) in the setting of a left-sided aortic arch with maximum diameter of 51 mm and a diameter of 32 mm at its origin. The left and right common carotid arteries originated from a common trunk. Due to the high surgical risk, patient was deemed unsuitable for open surgery and therefore scheduled for a total endovascular repair. Landing zone 2 was unfeasible due to anatomic reasons; the distance between ARSA and left subclavian artery (LSA) was of 7 mm only. Therefore we planned to exclude the KD with a thoracic endograft landing in zone 1, with chimney technique to revascularize left subclavian artery in antegrade fashion and periscope technique to revascularize ARSA in a retrograde fashion. The technique was performed in a surgical hybrid suite, under local anesthesia. After a right common iliac angioplasty due to significative stenosis, a Cook Zenith Alpha 34-113 (Cook Inc., Bloomington, Indiana) was advanced in aortic arch. Under road map angiography we advanced and deployed a 10-8 covered stent (Fluency, Bard Inc., Karlsruhe, Germany) between ascending aorta and LSA, and we reinforced it with a nitinol bare metal stent (Protégé GPS 10-6, Ev3, Plymouth, MN). From the left femoral access we introduced a stiff guide to the right axillary artery. Hereafter we advanced and deployed through a 7 Fr. Destination guiding sheat (Terumo, Japan) 2 Viabahn endografts (W.L. Gore and Associates, Flagstaff, AZ), 8-15 and 8-10, between ARSA and descending aorta. We reinforced also the Viabahn endografts with bare metal stents (Protégé GPS 8-60 and 8-40, Ev3, Plymouth, MN). Under road map angiography we deployed the Zenith Alpha thoracic endograft just distally the origin of the carotid common trunk. From a VER catheter, positioned between the aortic wall and the endograft, we finally performed an intraluminal spiral embolization of the aneurysmatic diverticulum. Postoperative period was free from complications, an

angioCT scan 3 years after the procedure demonstrates the complete exclusion of KD and the patency of supra-aortic trunks. This technique seems safe and feasible, although it represents an off -label application.

00292

Computational approach for determination of the mechanical wall stress within abdominal aortic aneurysm pre- and post-EVAR treatment

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BACKGROUND: Abdominal aortic aneurysm (AAA) is a permanently dilatation of aortic diameter which, during the time, can lead to the completely degradation of aortic wall properties and cause rupture and death. In order to avoid such consequences, endovascular aneurysm repair (EVAR) intervention is required, especially in case of high-risk patients. In order to obtain a better insight into the degraded aortic wall properties within an AAA and to compare it with aortic wall behaviour after stent graft implantation, we created the patient-specific models. These models were employed in computational structural analyses which gave us the answer about mechanical characteristics, such as Von Mises stress, which cannot be examined *in vivo* experiments.
METHODS: This study was based on an individual patient who had an AAA. The patient-specific geometry was reconstructed for two different cases: before and after EVAR treatment. The computed tomography (CT) scan images were imported into the segmentation software in order to create the patient-specific three-dimensional (3D) models from two-dimensional (2D) data. Two structural analyses based on the Finite Element Method (FEM) were performed with applied appropriate boundary conditions for non-stented and stented AAA. In the first simulation, the blood pressure was applied on the inner aortic wall surface, while in the second simulation it was applied on the inner surface of modelled stent graft (SG) geometry. The second simulation included interaction between the SG, intraluminal thrombus (ILT) and aortic wall. An average material characteristics and thicknesses were assumed and prescribed for the both cases. Also, the inlet and outlet flat surfaces of the models were fixed.
RESULTS: In the present work, the structural analysis was selected to provide a comprehensive assessment for aortic wall behaviour pre- and post- EVAR treatment. After performed computational simulations, the Von Mises stress at the moment of the highest blood pressure (peak systole), as the worst case scenario, was examined. The Von Mises stress, as the main parameter for evaluation of aortic wall degradation and rupture risk, was analysed with accent on the areas of high stress in the wall. After simulation of the preoperative condition, the high Von Mises stress (0,48 MPa) at the aortic bifurcation and aneurysmal neck indicated the need for operative treatment. The second simulation in the post-operative case resulted in significant decreasing of the Von Mises stress within aortic wall while on the other hand SG was under the high stress (0,54 MPa). Reduction of the material characteristics degradation indicated beneficial outcome of the EVAR procedure, but it needs the follow-up in order to predict the post-operative complications.
CONCLUSIONS: In summary, this study proved that computational structural analysis of AAA can be useful for determination of pre- and postoperative aortic wall stress states which have significant influence on the patient's health condition. Beside clinical assessment, computational modelling and simulations have great importance for improving aneurysmal examination and patient monitoring. Therefore, this type of simulations should be further investigated in larger studies, which may bring them into a daily clinical practice.
ACKNOWLEDGMENTS: Research supported by the grants: EC HORIZON2020 689068 SMARTool, and III41007 and OI174028 Ministry of Education, Science and Technological Development of Serbia.

00243

12 years follow-up post-TEVAR in type B aortic dissection showed with 3D printing

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BACKGROUND: We reported the case of a patient originally treated for complicated acute type B AD. Endovascular repair successfully excluded the entry tear but, during follow-up, patient experienced several complications. 3D full-size objects are printed to shed light into the interventional sequence during the 12 years follow-up and as an hands-on tool for medical education.
CASE REPORT: In 2005, a 66-year old man presented to our Hospital with abdominal and lower back pain. The patient underwent CTA scan, which revealed Stanford type B AD complicated by impending aortic rupture. The false lumen supplied blood to the left renal arteries, while the true lumen fed the celiac trunk, the right renal artery, and the mesenteric arteries. Endovascular treatment was successfully performed by positioning a thoracic Zenith Cook (Cook Inc, Bloomington, Ind) device. The patient carried out regular annual follow-up which showed a dissected chronic type IV thoraco-abdominal aneurysm growing over the time. 6 years after endovascular treatment, when the aneurysm maximum diameter reached 68 mm, the patient was submitted to open surgical treatment with aorta replacement, aortic reimplantation of both left and right renal arteries and bypass of celiac and superior mesenteric artery. The proximal anastomosis of the aorto-aortic graft was carried out distally from the thoracic aortic endoprothesis in a non-aneurysmal tract. During follow-up, aneurysmal dilatation of ascending aortic arch and right emiarch with maximum diameter of 59 mm was found. After 9 years from the first endovascular treatment, the patient was subjected to ascending aorta replacement with transposition of the anonymous trunk and the left common carotid artery. 11 years after the first endovascular treatment, during follow-up CTA examination, a gradual enlargement of the descending thoracic aorta between the thoracic endoprosthesis and the surgical graft with type IB endoleak was detected. A two-staged totally endovascular treatment was planned. In the first stage, a proximal side-branched custom made Zenith Cook endograft was positioned to preserve intercostal branches flow with partial overlapping on the previous implanted thoracic endoprosthesis. A distal custom made fenestrated Zenith Cook endograft was also implanted with fenestration for superior mesenteric artery, celiac artery and right renal artery bypass and the treatment of the renal artery was completed by positioning a covered-graft. After 3 months, a covered stent for the bypass of the superior mesenteric artery and the celiac trunk with left humeral access has been positioned. Finally, the side-branch was covered by positioning a Zenith Cook Thoracic endograft. Post-operative CTA showed complete exclusion of the aneurysm with patency of all vessels.
Despite in the last years the number of applications of 3D printing in the medicine field has exponentially increased, in the vascular area it did not have widespread application yet. The entire follow-up advancements and the interventional procedures have been well documented by means of hollow 3D printed models which were manufactured through binder jetting technology (Project 460+, 3DSystems). In our opinion, the use of 3D printed models, which enables direct visualization and assessment of all anatomical features, has proven beneficial helping patients better understanding their condition and also improving the preoperative planning for surgical complex procedures. In addition, the use of 3D printed models has proven to be particularly useful to train medical students and young residents with complicated cases.

00101

Control of damage and provide reperfusion by transient arterial shunt in a child with external iliac artery injury

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BACKGROUND: When we encounter a peripheral vascular injury case that accompanying life-threatening emergencies, our first priority is to take control of bleeding. Transient intravascular shunt use is an effective damage control procedure in cases of vascular trauma. And thus, the vascular damage could be taken control, allows temporary reperfusion of limb and provides an opportunity to treatment of other injuries. Here, we presented a case of a 9-year-old girl who was injured in the civil war in Syria and been referred to our clinic by using a temporary arterial shunt for her injured right external iliac artery.
CASE REPORT: A 9-year-old girl was wounded by fragments of bombs in Syria and was referred to our hospital. Damage control surgeon (DCS) reported that they used a temporary arterial shunt in the right external iliac artery to control the bleeding. They also reported that they could not start anticoagulant treatment because of the suspicion of the possible intra cerebral hemorrhage. The patient reached our clinic after approximately 450 km of ground transport. On physical examination, the patient was unconscious and intubated. The arterial blood pressure was 113/62 mmHg and the heart rate was 134 beats per minute. At the lower right quadrant of abdomen, just above the inguinal ligament, there was an about 5x5 cm in size and irregularly limited wound which was enlarged about 10 cm long with a vertical surgical incision in upward and then was sutured. In the right lower extremity, the femoral artery pulse was palpable. Right popliteal artery and distal pulses were biphasic at sonic doppler ultrasonography examination. All distal pulses on the lower left extremity were palpable. There was no acute ischemic finding on the right lower extremity. We consulted with a neurosurgeon, a pediatric surgeon and an orthopedics and traumatology specialist about the patient. And then an emergency operation was performed with the aim of revascularization. When the sutured wound was explored, it was observed that an approximately 5 cm in length temporary arterial shunt was inserted in the right external iliac artery. The pulse was palpable at the distal of shunt. Common, external and internal iliac arteries were isolated with individual nylon tapes. Due to the contraindication of anticoagulation which was reported by the neurosurgeon because of possible intra cerebral hemorrhage, arterial clamping was performed without heparinization. The temporary arterial shunt was removed. Proximal and distal embolectomy was performed, no embolus was obtained. Reverse-transposition of the saphenous vein graft was performed. Persistent reperfusion on the extremity was provided. Postoperative, all pulses on both lower extremities were palpable. In situations where emergency damage control surgery has to be performed, such as a battlefield, in appropriate cases, temporary vascular shunting in extremity's vascular injuries; considering the prolonged duration of reperfusion, it reduces complications arising from ischemia. In addition, it is undeniable that this cheap and easy-to-use method provides time to administer treat for the other injuries without haste.

00398

Specificities of vascular injuries in agriculture

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BACKGROUND: Agricultural activity seems to be an economic lifeline for almost any country in the world, while performing such duties consequently can cause serious injuries which can have multiple individual and social effects. Agricultural injuries have higher rate of incidence, higher than many other industries. Injuries in agriculture are often linked with massive destruction of the tissue, traumatic amputation of body parts, they are mutilants and involve more than one body system (musculosceletal, nervous, vascular, etc). The risk of development of local or systemic infection is also augmented. The aim of the study was to show specificities and significance of agricultural injuries.
METHODS: Retrospective analysis of medical records of patients who suffered vascular injury in agriculture during the period from 2005 til 2017, hospitalised at the Clinic for vascular and endovascular surgery of Clinical Centre of Serbia.
RESULTS: This study provides epidemiological data of treated patients and injury statistics. The majority of study participants were middle aged males. It also provides vascular injury of upper or lower limbs and incidence of co-injuries.
CONCLUSIONS: Agriculture has a seasonal character, which also means intensified labor during the Autumn months in the Northern hemisphere and potential usage of agricultural machinery at the time. Regarding analysis from this study, it shows the most frequent injuries happen with rotational machine parts. Due to specific way of inflicting injuries, it is most expected to find all sorts of soft and hard tissue destruction including nerves, blood vessels and muscular structures. Therefore it requires multidisciplinary surgical approach with uncertain outcome. Also, there is a prolonged hospital care including high general costs, with potential permanent invalidity to predominantly male working population. The agriculture industry has one of the highest rate of injuries, patients are often working part of population, and understanding of scenario injury, should enchance treatment, rehabilitation and outcome. These information should help in development and implementation of prevention programs and policies.

00244

Assessment of geometrical remodeling of the aortic arch and descending thoracic aorta after hybrid treatment

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BACKGROUND: Aim of the study was to measure the morphological remodeling of the ascending aorta, aortic arch and thoracic aorta after aortic arch hybrid treatment.
METHODS: Pre-operative and 1 month follow-up Computed Tomography Angiography (CTA) scans of 22 patients were analyzed to compute the lumen centerline, from the aortic root (AR) to the celiac trunk, and the following measurements were derived: total centerline length (L), Euclidean distance between the centerline endpoints (CVD). For both pre- and post-operative centerlines, point-wise curvature was measured at the proximal (P1) and distal ends (D1) of the endografting zone and at the proximal (P2) and distal portions (D2) of the overlapping zone in case of multiple endografts. Mean curvature values of the ascending aorta (AsAo), endografting region (ER), and descending aorta were measured as well.
RESULTS: Altogether, 41 endografts corresponding to three different types of devices were deployed: 10 patients (45 %) received the Low-Profile Zenith Alpha endograft (Cook, Bloomington, Ind), 7 (32 %) received the Relay NBS (Bolton, Barcelona, Spain) endograft and 5 (23 %) the Gore C-TAG (W.L. Gore and Associates, Flagstaff, AZ) endograft. Technical success was achieved in 100 % of cases. No intra-operative deaths, paraplegia or other major complications occurred. There were no deaths within 30 days of surgery. 30-days follow-up complications were the following: primary type Ib endoleak was observed in 1 case, and re-intervention was necessary in 1 case due to asymptomatic retrograde type-A aortic dissection (AD) revealed by 1-month CTA. L significantly increased after intervention (382.66±48.69 mm to 388.1±50.75 mm; $P<0.05$). Similarly, centerline curvature increased in

P1 (+29 %, P=0.01), D1 (+63 %, P<0.005), and D2 (+43 %, P<0.005). Mean curvature increased in the AsAo (+7 %, P=0.01) and decreased in the ER (-3.3 %, P<0.005) after surgery. The procedure had no statistically significant impact on the other measured quantities. Comparisons within Ishimaru's zones showed a significant increase in the curvature in D1 (+46 %, P=0.03) and AsAo (+14 %, P<0.01) within zone 0, and an increase in curvature in P1, D1, D2 within both zones 1 and 2. No evidence of a relationship of such a remodeling with the type of endograft and type of pathology was observed. Curvature changes correlate with complications occurred at short-term follow-up. In particular, the patient with type IB endoleak showed a curvature increase of +110 % in D1. The patient who developed type-A AD reported point-wise curvature increase of +100.2 % in P1 and mean curvature increase in the AsAo of +22.5 %.
CONCLUSIONS: Hybrid arch repair was associated with a significant elongation of the vessel and a significant increase of curvature on the ascending aorta and on endograft proximal and distal landing zones. This issue reveals the need for further investigations about more conformable and dedicated stentgrafts for different thoracic aortic diseases.

00393

One-center results of surgical treatment in patients with carotid arteries atherosclerosis

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BACKGROUND: To evaluate and to compare the results of treatment in patients with atherosclerotic lesion of internal carotid arteries (ICA) performed in one medical Centre with one vascular and interventional team.
METHODS: A prospective analysis of 2 groups of patients (n = 203) with atherosclerotic lesion of the internal carotid arteries performed. There were two groups, the first group (n=110) underwent open surgical intervention – carotid endarterectomy (CEA) (1 group), and the second group (n= 93) of patients underwent endovascular treatment (group 2) – stenting with balloon angioplasty. Patients (133 men, 70 women) had an average age of 67 years. Risk factors was identified: smoking – in 87.2 %, arterial hypertension – in 96.6 %, hyperlipidemia – in 71.4 %, coronary artery disease – in 64 % of cases. Indications to the operation were hemodynamically significant stenoses more than 70 % with asymptomatic flow. In the 1st group of CEA, there were performed carotid endarterectomy with xeno-pericardium flap plasty – 14 cases, and eversion technique – 96 patients, in 5 cases with the elimination of the tortuosity of the ICA. Intraluminal shunt performed in only one patient with a very low tolerance to carotid compression due two contralateral ICA occlusion and significant vertebral arteries stenoses. Carotid angioplasty and stenting of the ICA performed in the 2nd group in patients with an embolic protection device, in 1 case the use of a protective device was not possible. The examination was conducted in the early postoperative period and the long-term period up to 12 months.
RESULTS: Technical success of surgery was excellent in the 1 group, and 98,3 % in the second group because of expressed carotid bifurcation calcinosis and impossibility of delivery system insertion in 1 patient. In the postoperative period up to 30 days, survival in both groups was 100 %. Low percentage of complications observed in patients of both groups. In the first group in the early postoperative period 4 cases of stroke from the ipsilateral side recorded with low neurological insufficiency. In the second group in the early postoperative period 2 cases of stroke from the ipsilateral side recorded with low neurological insufficiency. TIA registered in 1 case for each group. Restenosis were detected in 3 patients from the 1 group, and in 1 patients from the 2 group in the long-term period up to 12 months.
CONCLUSIONS: Careful selection is mandatory in carotid surgery. Presence of risk factors, neurological status, form of stenosis, evaluation of collateral circulation influence to the choice of tactics of surgical treatment.

00275

Large diameter (>29 mm) proximal aortic necks are associated with increased complication rates after EVAR for AAA

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BACKGROUND: Endovascular aneurysm repair (EVAR) has gained wide acceptance as the primary treatment choice for patients with anatomically suitable abdominal aortic aneurysm (AAA). Maintenance of a successful seal between the proximal aortic neck and the stent-graft remains of paramount importance. Dilatation of the proximal landing zone affects a considerable proportion of EVAR patients and has been related to worse clinical outcome, as indicated by increased rates of type I endoleak, migration, and reinterventions. An initially wide infrarenal aortic neck requires endovascular treatment with a respectively large device, pushing standard EVAR toward its limits. The aim of this study is to investigate the impact of proximal aortic diameter on outcome after endovascular repair (EVAR) of infrarenal abdominal aortic aneurysms.
METHODS: This was a case-control (1:1) retrospective analysis of prospectively collected data on 732 patients with an abdominal aortic aneurysm (AAA) treated with EVAR in two university centers. Patients with an infra-renal neck diameter of 29-32 mm (study group) were compared with patients with a neck diameter of 26-29 mm (control group) matched for age, gender, and maximum aneurismal sac diameter. Any patients treated outside the instructions for use of each endograft or with not adequate follow-up were excluded. The primary end-point was any neck-related adverse event, as a composite of type Ia endoleak, neck-related secondary intervention and endograft migration during follow-up.
RESULTS: Sixty-four patients with a proximal neck diameter of 29-32mm (study group) were compared with a matched control group of sixty-four patients with a neck diameter of 26-29mm (control group). Oversizing was significantly higher in the study group (17.9% vs. 15.5%, p=0.001). Overall median available follow-up was 24 months (range 12-84 months), (study group: 24 months vs. control group 18.5 months, p=0.943). Primary end-point was recorded in 8 patients (12.5%) of the study group and in 1 patient (1.6%) of the control group. Freedom from the primary endpoint at 36 months (SE <10%) was 87.3% for the study vs. 98.4% for the control group (log rank=4.66, p=0.03). On multiple regression analysis, the presence of a proximal aortic neck >29mm was the only independent risk factor for neck related adverse events (OR 7.4; 95% CI 1.2-47.1).
CONCLUSIONS: EVAR in patients with large diameter proximal aortic necks seems to be associated with higher neck-related adverse events rate. Close surveillance of those patients after EVAR in the long-term appears as useful to prevent complications. The benefits from other endovascular solutions, such as fenestrated or chimney EVAR, should be considered in these patients.

00189

Spontaneous type Ia endoleak sealing in patients undergoing endovascular aneurysm repair with the ovation endograft

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BACKGROUND: Type Ia endoleak is an important complication after endovascular aneurysm repair (EVAR) which according to international guidelines, should always be treated since it may lead to continuous sac pressurization and late rupture. Several techniques are available in order to treat this adverse event such as proximal aortic cuffs, palmaz-stents, and embolization with glue or coils. There have been scarce reports in the

literature suggesting that some Type Ia endoleaks may spontaneously seal after various periods of follow-up. Taking into account the original sealing mechanism of the Ovation endograft exploiting 2 polymer filled O-rings that accommodate the individual neck anatomy of each patient rather than self-expanding stents, we hypothesize that spontaneous Type Ia endoleak sealing may occasionally occur following the use of this specific endograft. We aim to report our experience with spontaneous Type Ia endoleak sealing in patients treated with the Ovation endograft.
METHODS: Consecutive patients treated with the Ovation endograft in a single institution were retrospectively evaluated. Cases in whom intra-operative Type Ia endoleak was observed in completion angiography which did not resolve by simple ballooning of the proximal end of the endograft and where additional intraoperative endovascular procedures were not possible were recorded. These patients underwent additional CT imaging at 1 and 3-months postoperatively and in case the endoleak persisted additional procedures to treat this complication were planned. The primary endpoint of the analysis was rate of spontaneous sealing. Secondary endpoinds were migration, sac expansion, need for re-interventions, secondary Type Ia endoleaks, aneurysm-related and overall mortality. Adherence to the instructions for use (IFU) was evaluated in order to examine relation with occurrence of endoleak and rates of spontaneous sealing.
RESULTS: During a 6-year period 147 patients underwent EVAR using the Ovation stent-graft system. Overall 8 (5.4%) intra-operative Type Ia endoleaks were recorded. Pre-operative anatomy of patients was inside the neck IFU criteria in 3 cases and outside in the remaining 5. In the latter group the specific variable that was out the IFU was the angulation in 3 and the neck length in 2 cases. Six out of 8 patients presented spontaneous sealing during a maximum of 3-months follow-up. Five of these cases were out of the endograft's IFU and the sixth case was a patient that was anticoagulated and had to temporarily interrupt anticoagulant treatment. The endoleak persisted in 2 patients. One with a conical neck length of marginal length who underwent proximal aortic cuff insertion and one with circumferential calcification who refused additional treatment. No migration, increase in the dimensions of the sac or aneurysm related mortality were observed during a median follow-up of 24 months. Out of the IFU treatment was significantly more common in the group presenting a Type Ia endoleak.
CONCLUSIONS: According to a single-institution experience, in patients treated with the Ovation endograft, spontaneous sealing of Type Ia endoleaks is not uncommon. AAA treatment out of the IFU results in higher rates of Type Ia endoleaks but does not seem to reduce possibilities for spontaneous sealing.

00327

Results of endovascular treatment in patients with aorto-iliac occlusive disease

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BACKGROUND: To evaluate short-term results of treatment in the patients undergoing iliac artery stenting for TASC II type B, C, and D iliac lesions.
METHODS: 57 iliac endovascular procedures (63 limbs) were performed in 57 patients from January 2017 to the present in the Department of Cardiovascular Surgery of Almazov National Medical Research Centre. The average age of the patients was 63.86 ± 7.51 years. Men - 42 (73.7 %), women - 15 (26.3 %). Risk factors was identified: smoking - 87.5%, arterial hypertension 96.5 %, hyperlipidemia 61.4 %; 21 % of patients had type 2 diabetes, of which 5.3% had the neuroischemic diabetic foot. Chronic lower limb ischemia was presenteed in all cases. The division by stages according Fontain-Pokrovskiy classification was: the 2nd - in 59.7 %, the 3rd - in 29.8 %, the 4th - in 10.5 % cases. According to the multispiral computed tomography-angiography occlusion of the terminal aorta and iliac arteries was revealed according to the TASC: type B - 8.8%, type C - 10.5%, type D - 80.7%.
RESULTS: In 49.1% of cases, recanalization was performed by retrograde access through the ipsilateral common femoral artery (CFA), in 40.4% by antegrade access through contralateral CFA, in 10.5% by antegrade access through the brachial artery. Stiff wires were used for all cases. In 15.8% of cases the "kissing stent technique" was performed because of significant aorta bifurcation lesion. In 3.5% of patients with bilateral lesions one of ICA recanalization failed due to the chronic "flush" occlusion on a one side. There were some troubles with retrograde re-entry to the true lumen and antegrade plaque cap perforation. According to control angiography residual left EIA stenosis was in 1 patient, residual left CIA stenosis was 70% in 1 patient, balloon angioplasty of the left CIA was performed with the optimal result. The technical success in the group with occlusive lesions of the aorto-iliac segment was 96.5%. In 1 and 3 months patients examinated. There were not blood flow reduction for all patients according to the ultrasound. 6-month patency is researching.
CONCLUSIONS: According to TASC II surgical treatment is recommended for type C lesion, and open surgery is a choice procedure for type D. Based on our experience it is possible to talk about endovascular surgical treatment of patients with aorto-iliac occlusive disease (type C and D in TASC II) with good short-term results. The technical success was 96.5%, the frequency of residual stenoses was 1.75%.

00358

The use of bioactive stent in patients with atherosclerotic lesions of superficial femoral artery:24-month results

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BACKGROUND: To evaluate the results of the use of stents with bioactive coating based in the treatment of patients with atherosclerotic lesions of the superficial femoral artery (SFA).
METHODS: Between January 2014 on December 2016 endovascular interventions on the SFA performed in 50 patients (32 men and 18 women, mean age 61,3 ± 9,2 years). By classifying TASC II occurred following types SFA lesions: Type A - 20(40%) of cases of type B and C - 18 (36%) and 12 (24%) cases, respectively. Stents used for implantation with a bioactive coating based on titanium oxynitride HeliFlex (HexacatH, France). The level of nitric oxide (NO) in blood (N=24 μmol/L) was determined with immunosorbent method by using test-systems (R&D Systems Inc., USA). Blood analysis was made before the surgery and in 7 days, 6 , 12 and 24 month after implantation of the bioactive stent.
RESULTS: The overall procedure success rate was 100%. Revealed normalization of blood levels of NO: preoperative average was 18,9 ± 2,3 mmol / l, after the operation in 7 days was- 28,9 ± 4,1 mmol / l.Primary patency of endovascular constructions were as follows:
- 30 days - 98%;(1occlusion);
- 6 months - 94% (3 occlusion);
- 12 months - 94% (1 restenosis, 2 occlusion).
-24 months-92% (4 occlusion)
A decrease in the level of nitric oxide was observed 6 months after stenting. Occlusion and restenosis from 6 to 24 months were diagnosed in patients with diabetes or concomitant defeat of the distal artery.
CONCLUSIONS: The use of stents with a bioactive coating based on titanium oxynitride increases the level of NO in blood that can help to prolong the period of function of endovascular constructions.
The data on the primary patency of stents of this type can hope to improve long-term results of treatment of patients with atherosclerotic lesions of the SFA.

00027

Endovascular stent-graft implantation for the treatment of peripheral pseudoaneurysms: six-year results from a cardiovascular surgery center

A. Yasim, E. Eroglu

Kahramanmaras Sutcu Imam University Faculty of Medicine, Department of Cardiovascular Surgery, Kahramanmaras, Turkey

BACKGROUND: Pseudoaneurysm occurs as the result of blood leaking from a defect developing in an arterial wall and being contained by

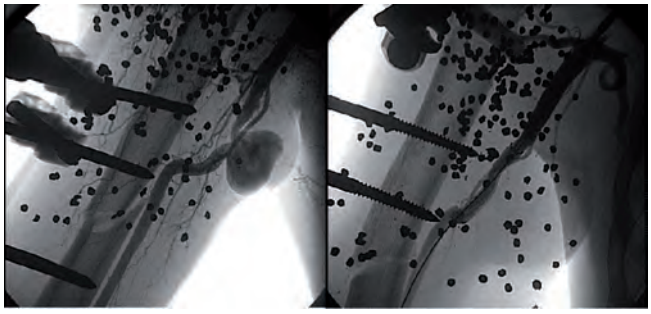

Figure 1.

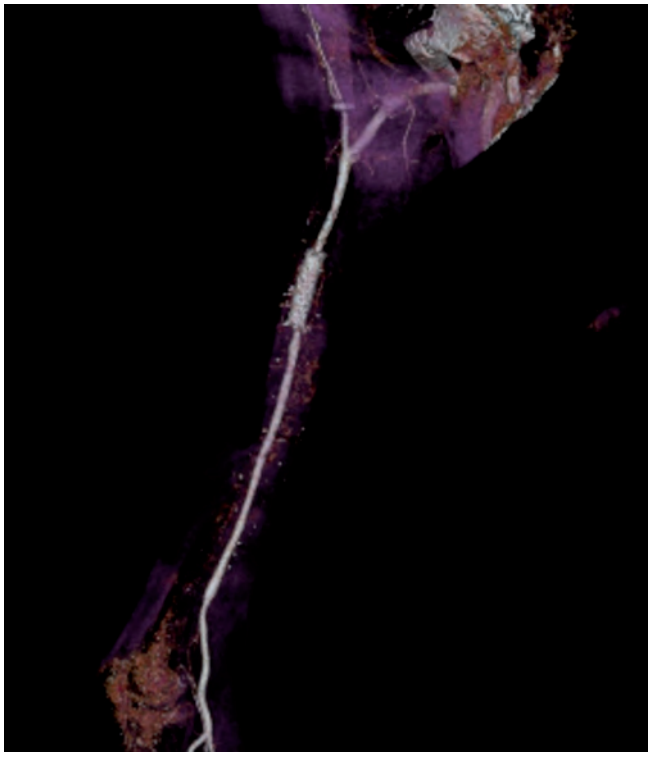

Figure 2.

a fibrous capsule consisting of surrounding tissue. It has recently been seen more commonly after trauma and surgery. Today, however, the prevalence of pseudoaneurysm is increasing in association with a rise in numbers of interventional procedures. There is also an increasing tendency toward endovascular methods in treatment.
METHODS: Endovascular procedures were performed due to pseudoaneurysm on 16 patients, 14 male and two female, in our department between August, 2011, and March, 2017. Diagnosis was based on clinical examination and colored Doppler ultrasonography (CDUS). Interventional procedures were planned for patients with aneurysms not disappearing with compression of the aneurysm sac or with no shrinkage in the sac. Patients were taken to the angiography unit, where imaging of the aneurysmatic region was first performed. The shortest stent-graft capable of closing the defect in the artery was implanted in the area of the pseudoaneurysm (Figure 1). Patients were invited for check-up three days after discharge, and clinical examinations were performed. Follow-ups were performed with CDUS after one week and with computerized tomography angiography after one month (Figure 2).
RESULTS: Patients were aged between 20 and 70, and the most common cause of pseudoaneurysm was interventional procedures. The most common site was the superficial femoral artery. Patients were discharged the day after surgery and were followed up for 8-59 months. Balloon dilatation was applied in two cases due to narrowing. One patient required bypass on month 20. Mean complication-free duration according to Kaplan-Meier analysis was 49.6 months (95% confidence interval: 39.9 months - 59.3 months).
CONCLUSIONS: Stent-graft implantation with an endovascular technique is a good option with low complication and high success rates and high patient satisfaction in the treatment of pseudoaneurysm. It is therefore increasingly replacing surgery.

SESSION: VASCULAR ABSTRACT SESSION II: CAROTID DISEASE

TIME: 16:00-18:00
ROOM 3: STRASBOURG

00329

Early carotid endarterectomy after stroke: 7-year experience

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BACKGROUND: The validity and necessity of carotid endarterectomy (CEA) within 6 weeks after carotid-related ischemic events remains debatable. A benefit of early CEA has been established by multiple reports and guidelines. However, a concrete timing and patients' selection are uncertain at present. In separate opinion, CEA can be performed in patients within the hyperacute period of stroke without significant increase of procedural risks, but it can be reduced a hazard of repeated ischemic events. The emergency CEA within first 6 hours is a worse understood problem. There is a plenty of opposite judgement about it.
METHODS: We have an experience in 272 early CEA (the mean age of patients 65.2±7.5) within 14 days after acute ischemic event in 2010-2017. 18 (6.6%) patients underwent the systemic thrombolysis beforehand. The main including criteria for emergency surgery were the significant stenotic lesion of carotid bifurcation, the neurological deficiency less than 15 (NIHSS) or less than 4 (Rankin scale), no signs of hemorrhage in MR, and less than one third of hemisphere focus volume. 31 patients (11.4%) with an acute thrombosis of the internal carotid artery underwent urgent surgery in first 6 hours after the event onset (group 1). The majority of patients (241 - 88.6%) underwent CEA between 2nd and 14th day after the stroke (group 2).
RESULTS: The eversion CEA was performed in 231 (84.9%) cases. In regard of routine usage of near infrared spectroscopy (NIRS) for intraoperative brain perfusion monitoring the selective carotid shunt was applied in 13.2% only in cases of critical clamping intolerance. The serious adverse events immediate after the surgery (stroke, myocardial infarction, hemorrhage transformation) were happened in 26 cases (9.6%). More than 17.3% of patients in both group had been suffered from non-fatal transient brain swelling. However, the rate of this complication in urgent group 1 was higher, up to 51.6%. And indeed, postoperative complications were prevalent in group 1 naturally. The common postoperative lethality averaged 5.9%. The neurogical im-

Fig. 1. Treatment results (n (%))

	All pts (n=272)	Group 1 (n=31)	Group 2 (n=241)
Postop SAE, incl.	26 (9.6)	9 (29.0)	17 (7.1)
stroke	5 (1.8)	3 (9.7)	2 (0.8)
hemorrhage	13 (4.8)	4 (12.9)	9 (3.7)
MI	4 (1.5)	1 (3.2)	3 (1.2)
Non-fatal brain swelling	47 (17.3)	16 (51.6)	31 (12.9)
Postop lethality	17 (6.3)	6 (19.4)	11 (4.6)
Neurological improvement	203 (74.6)	20 (64.5)	183 (75.9)

provement was detected in 74.6% within 10 days after the surgery and 86.0% within 6 months (fig. 1).
CONCLUSIONS: In our opinion, the CEA within first two weeks after carotid-related ischemic events is enough safe, effective and indicated for treatment of well selected patients.

00063

Retinal ganglion cell complex and peripapillary retinal nerve fiber layer thickness following carotid endarterectomy

O. Guclu

Medical School of Trakya University, Department of Cardiovascular Surgery, Edirne, Turkey

BACKGROUND: Internal carotid artery stenosis (CAS) leads chronic progressive hypoperfusion of the eye. The treatment of CAS is carotid endarterectomy (CEA) which is a widely accepted, effective surgical process for both symptomatic and asymptomatic patients with high grade carotid artery occlusion. However, it still remains unknown that why some eyes show no clinical symptoms of ocular ischaemia in patients with internal carotid artery disease. We examined the changes in retinal ganglion cell complex layer and peripapillary retinal nevre fiber layer thickness by optical coherens tomography (OCT) in contralateral and ipsilatateral eyes of CAS patients before and after carotid endarterectomy.
METHODS: Fourty two patients diagnosed with CAS (70% - 99% of stenosis rates) and had CEA operation between 2015 January and 2016 December were included in this is prospective cross sectional study. The CEA indication was based on the Asymptomatic Carotid Atherosclerosis Study (ACAS). Doppler ultrasonography and computorized tomography (CT) angiography were performed to calculate CAS. All subjects underwent ophthalmological examination including best corrected visual acuity (BCVA), intraocular pressure measurement (IOP), biomicroscopy, fundoscopy and optical coherens tomography.
RESULTS: The study included 21 ipsilateral and 21 contralateral eyes of 21 patients (15 male, 6 female) with a mean age of 63.7 ± 5.58 years. The mean preoperative IOP was 15.2 ± 2.1 mmHg in ipsilateral and 15.8 ± 2.7 in contralateral eye respectively. And the mean postoperative IOP was 18.6 ± 3.0 in ipsilateral and 19.3 ± 3.8 in contralateral eye. The IOP is significantly higher in postoperative eyes (p=0.0001). There was a statistically significant decrease in peripapillary retinal nevre fiber layer thickness in superior quadrants postoperatively in ipsilateral eyes. The retinal ganglion cell complex layer thickness was not significantly different before and after CEA in ipsilateral and contralateral eyes.

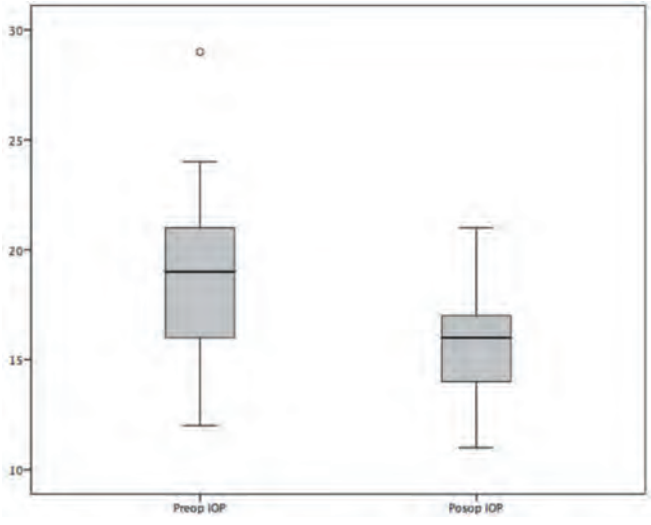

Figure 1.

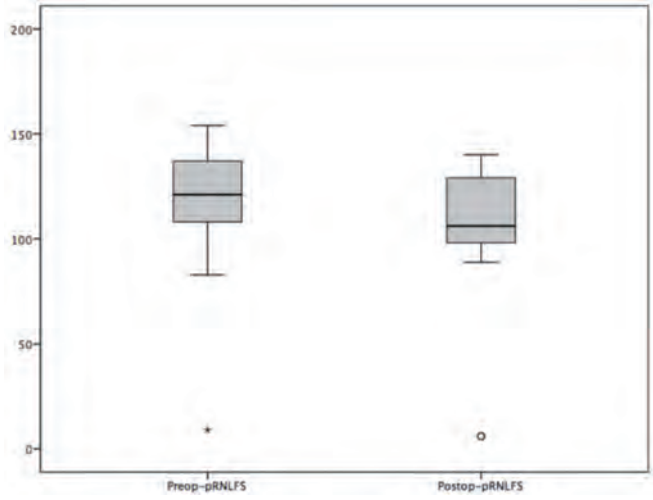

Figure 2.

CONCLUSIONS: Ischemia and reperfusion injury due to carotid endarterectomy results with thinning of superior peripapillary retinal nevre fiber layer thickness. For axonal protection; anti – vascular endothelial growth factor agents should be postponed if possible in the early preoperative and postoperative period of carotid endarterectomy. To the best of our knowledge, this is the first report evaluating peripapillary retinal nevre fiber layer and ganglion cell complex thickness before and after carotid endarterectomy. Further long term studies with large samples are needed to investigate if these alterations are progressive and accompying ganglion cell complex thinning in the following period.

00246

Coronary artery bypass surgery alone or combined with simultaneous carotid endarterectomy in severe concomittent coronary and carotid atherosclerosis: a randomized clinical trial

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BACKGROUND: The controversy on optimal management of patients with asymptomatic carotid artery stenosis undergoing coronary artery bypass grafting (CABG) has been ongoing for decades. Until now, there is no high-level evidence for any approach to treat patients with relevant carotid disease scheduled for cardiac surgery. We sought to investigate whether or not the perioperative rates of non-fatal stroke or death during synchronous combined carotid endarterectomy (CEA) and CABG were equal to isolated CABG.
METHODS: From 12/2010 through 12/2014, patients with coronary artery disease scheduled for elective CABG who had high-grade asymptomatic carotid artery stenosis (≥70% NASCET) were recruited at 17 centers in Germany (n=16) and the Czech Republic (n=1) in the Coronary Artery Bypass graft surgery in Patients with Asymptomatic Carotid Stenosis (CABACS) randomized controlled trial. Patients were assigned to synchronous combined CEA and CABG or isolated CABG using a web-based stratified block randomization (1:1, stratified by center, age <60 *versus* ≥60 years, sex, modified Rankin Score 0-1 *versus* 2-3). The primary composite endpoint was the rate of non-fatal stroke or death within 30 days after operation. Secondary endpoints comprised the rate of myocardial infarction, ipsilateral strokes and disabling strokes. Events were adjudicated by blinded observers, and the primary analysis was performed on the intention-to-treat (ITT) population.

RESULTS: A total of 129 patients were enrolled in the trial. Two patients of the isolated CABG arm withdrew consent before operation and were excluded. Enrolment was terminated early due to withdrawal of funding following insufficient recruitment. Among 127 patients in the ITT population, the composite rate of non-fatal stroke or death at 30 days was 12/65 (18.5%) patients in the synchronous combined CEA and CABG arm and 6/62 (9.7%) patients in the isolated CABG arm (absolute risk reduction 8.8%, 95% confidence interval [CI]:-3.2% to 20.8%; pWALD =0.12). There was also no evidence for a treatment group effect for all secondary endpoints at 30 days even though patients who had isolated CABG tended to have better outcomes. For instance, the composite rate of stroke, myocardial infarction or death was 12 (18.5%) after CEA+CABG as compared with 7 (11.3%) after isolated CABG (Hazard ratio [HR] 1.64; CI 0.69-3.88; p=0.32). At 1 year, there were more strokes after synchronous CEA+CABG but the difference was not significant (11 [18.3%] vs 4 [7.0%]; HR 2.61; CI 0.88-7.73; p=0.10).
CONCLUSIONS: Although our results cannot rule out a treatment effect, superiority of the synchronous combined CEA and CABG treatment modality is unlikely. Five-year follow-up of all recruited patients is ongoing. Clinical Trial Registration: Current Controlled Trials, ISRCTN13486906, http://www.controlled-trials.com, CABACS.

00287

Quantitative analysis and predictors of embolic filter debris load, during carotid artery stenting in asymptomatic patients

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Vascular and Endovascular Surgery, University of Padua, Padua, Italy

BACKGROUND: To perform a quantitative analysis and to identify predictors of embolic filter debris load, during carotid artery stenting (CAS) in asymptomatic patients
METHODS: All patients with asymptomatic carotid stenosis > 70% undergoing CAS between 2008 and 2016 were included in a prospective database. A distal filter protection was used in all patients. At the end of the procedure, the filter was fixed in formalin and then analyzed with a stereo-microscope. Morphometric analysis was performed with Image-Pro Plus software (Media Cybernetics). The total area of the filter membrane and the area covered by particulate material were quantified. The quantity of membrane occupied by debris was expressed as percentage of covered surface area. Anatomical and clinical variables were evaluated for their association with EFD load using multiple logistic regression.
RESULTS: Among the 278 patients undergoing CAS, open-cell stent was implanted in 211 patients (76%), while 67 patients (24%) received a closed-cell stent. Overall technical and clinical success were both 99%; no perioperative death was reported. Stroke rate was 1.8% (major: n=1, 0. 4%; minor: n=4, 1.4%), while transient ischemic attacks (TIA) occurred in 5% of cases (n=14). The filters quantitative analysis revealed that embolic filter debris were present in 74% of cases (n= 207). The mean EFD load was 10% of the filter surface (median, 1; range 0-80); it was <10% in 203 patients (73%), between 11-20% in 39 patients (14%), between 21-30% in 14 patients (5%), and >31% in 22 (8%). Patients with any type of ischemic neurological event after CAS (stroke and TIA) had a significantly higher mean embolic filter debris load compared to uneventful cases (26.7±19.0% vs 8.5±13.5%; P<.001). The observational frequency distribution analysis identified the presence of >12.5% embolic filter debris load as the optimal cut-off for the association with clinically relevant perioperative ischemic events (Sensitivity 78%, Specificity 77%, AUC 0.81). The multivariate analysis demonstrated that age > 75 years (OR, 2.56; P=.003), pre-existing ipsilateral ischemic cerebral lesions (OR, 2.09; P=.047), hypo-echogenic plaque at the preoperative duplex ultrasound (OR, 6.05; P <.001), and plaque length >15mm (OR, 1.79; P=.049) were independent predictors of embolic filter debris load >12.5%.
CONCLUSIONS: The majority of asymptomatic carotid stenosis treated with CAS have detectable embolic debris in the protecting filter; age >75, pre-existing ipsilateral cerebral ischemic lesions, hypo-echogenic plaque, and plaque length >15mm, should be taken in consideration as independent predictors of clinically relevant embolic debris during the procedure.

00376

Simultaneous coronary artery bypass grafting and carotid endarterectomy can be performed with low rates of major perioperative complication

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Institute of CarNational Medical Research Center of Cardiology, Moscow, Russian Federation

BACKGROUND: Optimal management of patient with severe concomitant carotid and coronary disease remains controversial. In this study we report on our experience with simultaneous carotid endarterectomy (CEA) and coronary bypass graft (CABG) surgery in our clinic.
METHODS: A total of 80 patients (67 males, 13 females; mean age 65,3±9,5 years; range 49-80 years) who were operated on coronary and carotid arteries simultaneously in the period from January 2010 to November 2017, were analysed. Demographic characteristics of the patients and a history of previous myocardial infarction (MI), hypertension, diabetes mellitus, hyperlipidaemia, peripheral arterial disease as well as a history of vascular procedures were recorded. Indications for combined procedures were severe unilateral carotid stenosis (>70%, peak systolic velocity>200 cm/s at duplex ultrasound imaging, confirmed ST scan) in a symptomatic patient, or bilateral carotid lesion in an asymptomatic patient, requiring CABG because of triple vessel disease or left main stem stenosis. The presence of ultrasound-determined ulceration/unstable plaque in case of carotid stenosis less than 70% (50-69%) was also an indication for CEA. CEA was performed under general anesthesia before CABG. Carotid shunts were applied in 7 patients (9%); the mean clamping time was 26±8 min. Surgery was performed using a microscope and microsurgical instruments. Mean aortic cross-clamp and cardiopulmonary bypass time were 60±21 min and 92±33 min respectively.
RESULTS: One patient died of heart failure in the postoperative period (1,3%). 1 patient (1,3%) suffered an ischemic ipsilateral stroke. TIA occurred in 1 patient (1,3%). Four patients (5%) developed minor peripheral neurological deficits. Two patients (2,5%) presented with a postoperative cervical hematoma. No nonfatal perioperative MI was observed. The cumulative incidence of major perioperative complications (death, stroke and MI) was 2,6% (1,3%+1,3%+0 resp.). Postoperative carotid duplex sonography was performed in all patients before discharge.
CONCLUSIONS: One-stage reconstruction of the coronary and carotid lesions is an effective method of surgical treatment in cases where a staged approach is threatening complications because of the extreme severity of both vascular beds stenoses.

00386

Surgical treatment for recurrent carotid stenosis: is the risk really high?

S. Botsios [1, 2], O. Khader [2], F. Blaes [3], A. Borchers [4], D. Pflitsch [4]

[1]Faculty of Health, Witten/Herdecke University, Witten, Germany; [2]Department of Vascular Surgery, Hospital Waldbröl, Waldbröl, Germany; [3]Department of Neurology, Hospital Gummersbach, Gummersbach, Germany; [4]Department of Anesthesiology and Intensive Care Medicine, Hospital Waldbröl, Waldbröl, Germany

BACKGROUND: The optimal management for recurrent carotid stenosis after carotid surgery remains controversial. The aim of the present study was to determinate the real risk of the surgical treatment for recurrent carotid stenosis in our institution.
METHODS: A retrospective analysis of prospectively collected data was carried out from 19 reoperations of 18 consecutive patients (eight females) with mean age of 72.8 ± 7.1 years (range, 56 - 84 years) presenting with recurrent carotid stenosis from 2012 until 2017 in our vascular surgical unit. The median interval between primary operation and

the reoperation was 93.8 ± 70.7 months (range, 12 - 300 months). Six patients were symptomatic.
RESULTS: The operative technique consisted of the carotid endarterectomy with bovine pericardium patch closure under general anesthesia. The 30-day mortality or stroke was 0%. Three patients had perioperative complications. One patient suffered reversible recurrent laryngeal nerve injury. Another patient had temporary hypoglossal nerve paresis, with subsequent complete regression. The thirth patient developed hypertensive crisis. During the mean follow-up of 45 months no restenosis was observed.
CONCLUSIONS: Carotid endarterectomy reoperation for recurrent stenosis can be performed safely and successfully with a minimal risk of cranial nerve injuries. Therefore in selected cases, reoperation remains the procedure of choice for reccurent carotid stenosis. Finally the decision for carotid reoperation should be made account to patient's individual clinical condition, morphological characteristics of the stenosis and experience of the surgeon.

00387

Carotid stenting *versus* endarterectomy for the treatment of carotid artery stenosis: contemporary results from a single center study

P. Nana [1], G. Kouvelos [1], V. Bouris [1], D. Xanthopoulos [1], M. Peroulis [1], E. Arnaoutoglou [2], G. Papadopoulos [2], M. Matsagkas [1]

[1]Department of General Surgery-Vascular Surgery Unit, Faculty of Medicine, School of Health Sciences, University of Ioannina, Ioannina, Greece; [2]Department of Anaesthesiology, Faculty of Medicine, School of Health Sciences, University of Ioannina, Ioannina, Greece

BACKGROUND: Although carotid endarterectomy (CEA) has long been considered the preferred intervention for carotid occlusive disease, carotid angioplasty and stenting (CAS) may serve as a minimally invasive alternative with equivalency in providing protection against ipsilateral stroke. The aim of the present study was to compare the complication rates associated with carotid endarterectomy (CEA) *versus* carotid artery stenting (CAS).
METHODS: We retrospectively analyzed patients with carotid artery stenosis admitted to our hospital for carotid revascularization between March 2001 and March 2015. Eligibility criteria for revascularization were determined on the basis of symptomatic stenosis over 70% or asymptomatic stenosis over 80%. The primary end point was a composite of periprocedural death, stroke, and myocardial infarction (MI).
RESULTS: Of the 483 patients admitted for carotid revascularization 283 (58.6%) underwent CEA and 200 (41.4%) CAS. In total 301 CEAs were performed. In the CAS group 207 procedures were performed. Symptomatic lesions were similar between the two groups (CEA group 181/301 vs 116/207, p>0.05). No differences in baseline characteristics were noted between the two groups. In the CEA group, thirty-day postoperative stroke rate was 0.9% (3/301). Major complications occurred in 3% (9 of 301) of the procedures and cranial nerve injury in 4.3% (13 of 301). In the CAS group, the technical success was 98.6% (204/207 cases). Thirty-day neurological events included stroke in four patients (2%) and transient ischemic attack in two (1%). None of the patients in both groups died during the first 30 days. Both groups demonstrated similar rates of the composite endpoint, MI, and death during the first 30 days after the procedure (p>0.05). During a follow-up period spanning an average of 88±34 months in the CEA group 11 patients experienced a late stroke. All late strokes were contralateral to the operated carotid, and 2 were fatal. Four carotid arteries (1.6%) developed restenosis, all asymptomatic. During a follow-up period of 52±28 months in the CAS group, none of the patients suffered any cerebrovascular event. There was only one asymptomatic restenosis observed at two years post-operatively.
CONCLUSIONS: The overall short-term outcome of CEA and CAS is not different in a center providing both techniques, while long-term protection against ipsilateral stroke did not also differ between the two methods. More real world comparative data outside RCTs and registries are needed to define the role of each technique in treating patients with significant carotid artery stenosis.

SESSION: VASCULAR ABSTRACT SESSION III: PERIPHERAL ARTERIAL DISEASE

TIME: 16:00-18:00
ROOM 3: STRASBOURG

00384

Influence of intraoperative intra-arterial thrombolysis with recombinant tissue plasminogen activator on long-term clinical outcomes in patients with acute popliteal aneurysm thrombosis

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[1]Clinic for Vascular and Endovascular Surgery, Clinical Center of Serbia, Belgrade, Serbia; [2]School of Medicine, University of Belgrade, Belgrade, Serbia

BACKGROUND: Acute lower limb ischemia (ALI) is the sudden onset of decreased arterial perfusion with an imminent threat to limb viability. Patients with ALI represent a high-risk cohort in need of complex revascularization procedures that are often associated with a significant rate of periinterventional complications. The consequences of ALI such as prolonged hospitalization, major limb amputation, and/or death have a profound socioeconomic impact worldwide. ALI after popliteal artery aneurysm (PAA) thrombosis represents a challenging problem and an emergency situation. Limb-threatening ischemia develops in 17% to 46% of patients with a PAA. There is an important risk of minor and major amputation in 20% to 44% of patients, despite emergency bypass grafting. This is mainly attributed to distal embolization in the peripheral vascular tree with disastrous runoff at the time of surgery. The aim of this study was to investigate outcomes of intraoperative intra-arterial tissue plasminogen activator (t-AP) as a thrombolytic agent in the treatment of ALI Rutherford grade IIa and IIb in terms of overall survival, major adverse limb event (MALE) and overall intrahospital complications, especially those associated with bleeding.
CASE REPORT: A total of 186 patients (Rutherford grade IIa and IIb) with acute thrombosis of PAA and ALI were admitted between January 1st 2009 and January 1st 2015. We divided PAA patients in two groups, those who underwent (20 patients) and those who didn't undergo additional treatment with intraoperative intra-arterial thrombolysis (136 patients). By using covariables from baseline characteristics, a propensity score was calculated for each patient. By using propensity matching score, each patient who underwent intraoperative thrombolysis was matched to 4 patients from non-thrombolysis group. Thus comparable patients cohorts (20 in thrombolysis group and 80 in non-thrombolysis group) were identified for further analysis. Primary end point was all-cause mortality and secondary MALE.
RESULTS: At 30 months, the estimated mortality was significant between two groups of patients (20% vs 46.25%) ($\chi 2$=2.52, DF=1, P=0.11, log rank test). On the other hand, after 30 months follow-up period, patients in thrombolysis group had significantly lower rates of MALE (15% vs 38.75%) ($\chi 2$=4.08, DF=1, P=0.043, log rank test).
CONCLUSIONS: Intraoperative intra-arterial thrombolysis in treatment of acute PAA thrombosis shows a significant reduction in terms of MALE events and even improves overall survival. No significant differences have been shown between groups in bleeding complications, except loco-regional ones.

00356

Treatment of popliteal artery aneurysms. Is open surgical repair still the best option?

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BACKGROUND: Open repair (OR) represents the gold standard in the treatment of artery popliteal aneurysms, but endovascular repair (ER)

could be a good option in high risk patients and anatomical feasibility.
METHODS: Two groups of patients (symptomatic and none) were evaluated for risk factors, type of treatment (OR/ER), 30 days mortality, 1 and 2 years primary and secondary patency rates, major amputations-free survival and re-interventions. In the OR group we studied type and length of grafts (vein vs prosthesis) and type of access. In ER group number of arteries, of devices (viabahn) and landing zone were planned. DuplexUS was used for follow-up.
RESULTS: From January 2005 to September 2017, 160 popliteal aneurysm were treated: 82,5% open repair (23 symptomatic) and 17,5% endovascular repair (1 symptomatic), the mean age was 72 years. Patients belong to OR received, in 57% vein graft and 43% prosthesis graft (ePTFE). In the ER patients, the landing zone was P3 in 71,4% (P2 in 25% and p1 in 3,5%) and in 64% were used 2 Viabahn (25% 1 and 11% 3).The mean recovery was 6 days for ER group and 10 days for OR patients. 1 year survival rate was almost the same in the two groups (97% vs 95%), but after two years OR group had better survival (p=0,046). 1 and 2 years patency rate was similar in ER group and patients who received open surgical repair with prosthesis (90%, 88%), while vein graft had best results (96%). 2 year freedom from re-interventions was better for ER group and for patients who underwent open repair with vein graft (96%). At two years, amputation-free survival was 100% for ER, while 99% at 1 year and 97,5% at 2 years.
CONCLUSIONS: Open surgical repair with great saphenous vein remains the gold standard, but ER seems to be a good option if vein graft is not available. The amputation and reoperation rate were the same in the two groups, but we need an accurate selection patients, anatomic feasibility and most of all, a good endovascular planning is crucial. The limitations of this work were a different number of treated patients, symptomatic or asymptomatic, lack of open repair group's data and retrospective study.

00291

Comparison of the primary patency between open and endovascular repair of popliteal artery aneurysms

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BACKGROUND: Popliteal artery is the second most frequent location of artery aneurysms after abdominal aorta. Indication of asymptomatic popliteal artery aneurysm (PAA) repair is a diameter more than 2cm, while acute thrombosis of PAAs represents the most important and common complication, associated with a high risk of limb loss. Open repair is the gold standard of popliteal artery aneurysm treatment with a satisfying long-term durability. Endovascular repair, as a minimally invasive method, may be an alternative technique in selected high-risk patients. The aim of this study was to present the experience of two vascular surgery departments on PAA treatment, concerning early and long term graft patency and possible affective factors.
METHODS: Between 2010 and 2017 in two tertiary university vascular departments, 23 patients (median age 74.5±7.5 years; 93% male ;) were treated for 28 popliteal artery aneurysms, electively or urgently after aneurysm thrombosis. Open repair with a vein or PTFE graft was used to treat 18 aneurysms while 10 popliteal aneurysms were treated with the endovascular technique. During follow-up, all patients underwent a duplex ultrasound at the 1st and 6th postoperative month to confirm patency. Demographics, comorbidities, medical treatment and graft patency in 30 days and 6 months were analyzed. All patients were recontacted to evaluate long-term patency through a clinical assessment.
RESULTS: In 6-month follow-up, primary patency was 85.6%, with no statistically important difference between open and endovascular technique. No reintervention was recorded during preliminary follow-up. A patient treated with open repair for an acute limb ischemia after popliteal aneurysm thrombosis underwent a transmetatarsial amputation during first post-operative month. No death was recorded. Graft patency was not associated with statin (log rank=1.57, p=0.21) or dual antiplatelet therapy (log rank=0.289, p=0.59). Long term patency revealed less encouraging results for both techniques. No reintervention or death was recorded. Beside graft patency and current clinical situation, most patients declare to be satisfied after aneurysm repair.
CONCLUSIONS: In our experience, 6-month follow-up graft patency after popliteal artery aneurysm repair is sufficient both after open and endovascular repair in elective and urgent cases. Endovascular treatment remains a viable alternative for selected high risk patients. This study revealed no predictive factor that may affect graft patency. Statin or double antiplatelet therapy was not associated to early graft patency. Long-term follow up reveal less satisfying results for graft patency with both techniques. Further studies and reviews are required before establishing equivalence between open and endovascular repair of popliteal artery aneurysms.

00184

Validity of adapting therapy in patients with lower limbs critical ischemia

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BACKGROUND: Cellular angiogenic therapy performed by peripheral autonomic mononuclear cells of blood has a safety and efficacy in the treatment of critical ischemia of the lower limbs in patients not candidates for revascularization. The aim of our study is to evaluate the possible adjuvant effect of angiogenic therapy not only in critical non-revascularizable ischemia, but also after endovascular revascularization.
METHODS: From February 2017 to Genuary 2018, 12 patients with critical ischemia of the lower limbs at stage IV Fontaine were subjected to infiltration of mononuclear cells taken from peripheral blood (A-PBMNC). Of these 12 patients, 9 an endovascular or surgical revascularization procedure were not candidates. To patients suffering from an endovascular revascularization procedure and one of these three patients, an infiltration test, a control analysis. We used the Monocell system a selective filtration (Athena) that allows to produce, in conditions of absolute sterility. 100 ml of peripheral blood in order to obtain 10 ml of cell concentrate inoculated by 30-45 injections each of 0.25m to 1-2 cm deep in the ischemic muscle along the anatomical course of the main Gamba vessels. This operation was repeated 3 times at a distance of 30-45 days apart from each other. Our follow-up includes weekly and instrumental clinical checks with doppler every 30 days for the first 6 months.
RESULTS: There were no adverse events (death, major cardiovascular events, anemia) or limb amputations in the observation period. VAS compared to baseline mean value (- 14.5% after the first cycle, - 45.4% after the second cycle - 72.7% after the third cycle) a reduction of the average area of ulcers (27% after the first cycle, -55% after the second cycle and -74% after the third cycle), an increase in TCPO2 compared to the baseline mean from + 19% in the first cycle to + 72% after the third cycle and an increase in the ABI values (+ 18% after the first cycle , + 42% after the second cycle and + 80% after the third cycle). One of the 3 patients subjected to infiltration of mononuclear cells and at the same time a cycle of infiltration, to control angiography that testifies the presence of neovessels with respect to angiography performed at the end of the procedure. All patients presented an improvement in quality of life.
CONCLUSIONS: Therapeutic angiogenesis seems to be a safe lower limb strategy, not just a therapeutic alternative in patients who are not candidates for revascularization in whom revascularization has been unsuccessful, but also as adjuvant therapy in revascularizable or revascularized patients in whom of the patient is subject to health problems. Although our case studies are still very limited and the follow-up period is very short, the results obtained push us to continue the experimentation in progress.

00200

Initial monocentric French experience with the biosynthetic vascular prosthesis OmniflowR II in aorto-iliac and femoral reconstruction

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BACKGROUND: Surgical treatment of major aortic infections remains a challenging issue. Currently available conduits, such as cryopreserved arterial allografts or silver-coated polyester prosthesis, for in situ reconstruction after excision of infected aortic grafts have significant limitations. The OmniflowR II vascular prosthesis (LeMaitre Vascular, Burlington, MA, USA) is a biosynthetic vascular prosthesis associated with a low incidence of reinfection that has successfully been used in the treatment of infected infrainguinal bypasses. Herein we report the first French experience with this biosynthetic vascular prosthesis in inguinal and aortoiliac position.
METHODS: From January 2016 to December 2017, 32 bioprosthetic vascular prosthesis OmniflowR II were implanted as a first line treatment in 29 high risk of reinfection patients. The main indication was septic arterial complications and 4 patients were implanted in emergency situations. Data were prospectively collected and retrospectively analyzed focusing on the following primary endpoints: patency, limb salvage, mortality and reinfection rates.
RESULTS: Operative mortality was 6,9 %. Mean hospital stay was 19,11 days (range 2-75 days). Mean age was 62,72 years [range 24-84 years] with a predominance of men (62,07%). Nine patients (31%) were implanted for graft infection, 7 patients (24%) had a preventive implantation as they were at high risk for infection, there were 4 cases of arterial infection after patch, 3 femoral traumatisms, 4 early femoral false pseudo aneurysms, 1 allograft degeneration and one septic aortic aneurysm. Secondary patency was 90%. Per-operative sampling was positive for infection in 12 cases but a germ was identified in only half of this cases with Methicillin Resistant Staphylococcus Aureus in 25% of cases. Re-operation rate was 28% and indications were as follows: bypass thrombosis in 3 patients, anastomotic rupture in 2 and 4 major amputations (3 transfemoral and one transtibial) for severe distal arteriopathy. No aneurysm nor dilatation and no OmniflowR II bioprosthesis infection were observed.
CONCLUSIONS: The use of this off-the-shelf biosynthetic graft is feasible and resulted in long term infection control without graft-related complications in our patients. Now that proof of principle has been demonstrated, larger series with longer follow-up are needed to establish its role in aortic graft infection control, graft-enteric fistulae and mycotic aortic aneurysms. Its intrinsic resistance to infection may make the biosynthetic OmniflowR II vascular prosthesis a promising conduit for aortoiliac reconstruction as a first line treatment.

00253

Clinical findings in end-stage renal disease patients on hemodialysis with peripheral arterial disease

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BACKGROUND: Peripheral arterial disease (PAD) is wide spread in the world, with over 200 million patients suffering from the disease. End-stage renal disease (ESRD) patients on hemodialysis (HD) have a significantly higher prevalence of PAD than the general population. Cardiovascular diseases are the most common cause of mortality in renal patients on HD. PAD is common in ESRD patients and presents an important marker of systemic atherosclerosis. Patients with PAD have a 4-5 times higher mortality rate caused by cardiovascular disease and a 2-3 times higher mortality rate than people without PAD. ESRD patients with PAD have a 10 times higher amputation rate than the general population. This study aims to determine the prevalence of PAD in HD patients as well as to analyze the presence of concomitant diseases.
METHODS: This cross-sectional study, included 156 ESRD patients on HD. We performed ankle-brachial index (ABI) measuring for all patients. PAD was diagnosed based on ABI <0.9 and on a history of prior vascular reconstructive surgery, endovascular procedures and amputations due to PAD. Also, all patients´ risk factors were analyzed, including the existence of concomitant diseases and biochemical parameters. Hi square test and Spirman's correlation were used to determine statistical significance.
RESULTS: PAD was present in 29.5% (46) of all sampled patients, of which 63% were male. The main cause of renal disease among the PAD patients that led to terminal uremia and HD was hypertensive nephrosclerosis (in 50% of cases) with diabetic nephropathy the second leading cause (with 21.7%). The PAD patients were significantly older than the non-PAD group of patients (67.7 ± 11 vs 63.2 ± 11 years respectively). 39.1% of the PAD patients had diabetes, which is, in statistical terms, significantly higher than the non-PAD group p=0.015. The PAD patients also suffered from hypertension more often but such findings are not statistically significant. The PAD patients had a higher percentage of large amputations, and they had a statistically significantly lower Kt/V (p=0.029). There was no significant difference in the incidence of smoking and dyslipidemia between the PAD and non-PAD patients. The PAD group had statistically significant lower levels of albumin and iron and higher glucose levels and C-reactive protein (CRP) (all p <0.05). Patients who had Hickman catheter as vascular access for HD had a higher incidence of PAD. In the multiple regression model, statistically significant predictors for PAD were Hickman access OR (95% CI) 3.86 (1.00-14.00) p=0.049 and CRP OR (95% CI) 1.03 (1.00-1.05) p=0.022.
CONCLUSIONS: ESRD patients on HD are a high-risk category of patients, with numerous concomitant illnesses, including diabetes, hypertension and a higher incidence of PAD than the general population. Patients with Hickman vascular access and higher CRP values have a higher probability for developing PAD. Adequate and timely diagnosis and treatment of all concomitant illnesses, especially PAD and other risk factors could be a solution for a better quality of life and postponement of unwanted events for these patients.

SESSION: VASCULAR ABSTRACT SESSION IV: VEIN

TIME: 16:00-18:00

ROOM 3: STRASBOURG

00048

Missing part of venous surgery: our approach to small saphenous vein reflux

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Izmir Katip Celebi University Ataturk Research and Education Hospital, Izmir, Turkey

BACKGROUND: Today, increased use of laser endovenous ablation made venous surgery easier and postoperative morbidities of patients decreased significantly. Small saphenous vein surgery, which is ignored in the past due to high complication rate, is now more favorable with these new techniques. In this study we aimed to investigate our surgical approach to small saphenous vein reflux and short term endovenous ablation experiences.
METHODS: Patients who admitted to our outpatient clinic between January 2017 and October 2017 were investigated retrospectively. Age, gender, preoperative comorbidities, diameters of saphena magna and parva, venous injury scores (Venous Disability Score, Venous

Segmental Disease Score and CEAP), surgical method (endovenous laser ablation, pack excision, perforating vein ligation and division-stripping), anesthesia techniques and postoperative complications were explored.
RESULTS: 35 patients (15 female (43%), and 20 male (57)) were operated in our clinic between January 2017 and October 2017 due to small saphenous vein reflux. Mean age was 43.8±14.4. One patient had deep venous thrombosis in his history and 1 patient had venous ulcer at preoperative period. Mean right and left vena saphena magna diameters were 4.54±1.88 and 4,50±1.60, respectively. Mean operated limb small saphenous vein diameter was 9.51±2.15. Mean operated limb CEAP score was 3.09±0.55. Mean venous disability score was 1.31±0.52. Mean operated limb venous segmental disease reflux score was 1.8±1.44. Although, expansion of small saphenous vein diameters are significant, VDS score resembling daily effect of venous disease is mildly high. CEAP score of operated legs are higher. This is associated with chronic venous disease. We used sedation-analgesia for 10 (29%) patients and local anesthesia for 25 (71%) patients. We performed small saphenous vein endovenous laser ablation to 21 patients (%60). Mean used energy amount was 842 ±286 joules (Min 600 joule, Max 1600 joule). Small saphenous vein division and stripping were performed to 13 patients (37%). We had only 1 complicated operation due to catheterization failure, so we performed catheter-guided sclerosing agent infusion to small saphenous vein. We also performed varicose pack excision to 19 patients (54%) and perforator vein ligation to 6 patients in same operation (17%). We did not see sural verve injury on postoperative period.
CONCLUSIONS: Great saphenous vein diseases are treated surgically for a long time. Small saphenous vein reflux is generally ignored by surgeons until today. It is considered risky because of its close neighborhood to sural nerve and its surgery may cause permanent nerve injury. Today, surgical experience for small saphenous vein is steadily increasing. Endovenous techniques are the best options for small saphenous vein surgery and these techniques can be used safely with guiding ultrasound imaging for avoiding complication risk.

00197

Use of covered stents in central vein stenosis following vascular accesses

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BACKGROUND: The main cause of failure of a vascular access, native or prosthetic, for hemodialytic treatment is central vein stenosis. Venous PTA still represents the first therapeutic option, although high rates of restenosis are present after short and medium term follow-up. The aim of this study is to present our experience in using nitinol - polytetrafluoroethylene covered stents in the treatment of recurrent or persistent central vein stenosis.
METHODS: We conducted a retrospective study (April 2011 - August 2017) on 23 patients with native or prosthetic vascular accesses in hemodialytic treatment, with significant stenosis at the venous side, that lead to a malfunction of the vascular access itself. The stenosis have been diagnosed with venous DSA or angioCT scan. All patients underwent covered stent placement (COVERA Bard, VIABAHN - Gore) followed by PTA with high pressure baloon of the venous stenosis. Patients characteristics (age, sex, race, type of hemodialytic access, comorbidity), previous endovascular procedures, stent type, perioperative complications, re-interventions and vascular access primary patency to 1, 3, 6, and 12 months were examined.
RESULTS: All 23 patients (mean age 55 years, 55% men) underwent covered stent placement of which 16 were Viabahn and 9 were Covera. In two cases both stents were placed. Four of the treated patients had already been subjected to PTA due to recurrent stenosis, while 19 patients had primitive stenosis. There were no perioperative complications. 5 patients died during the follow-up. The patients were examined at 1, 3, 6 and 12 months with clinical evaluation and us scan. The primary patency after stent placement at 1, 3, 6 and 12 months were 100%, 90%, 88% and 84% respectively.
CONCLUSIONS: In our experience the use of covered stents in the treatment of venous stenosis after a vascular access seems to be effective in treating the complications and to prolong the access life, especially in the prosthetic accesses, whose primary patency is 60-65% after one year from the literature data. There were no major complications in our small experience even if the patients had multiple and in some cases severe comorbidities. A wider number of patients over long term follow up is needed to obtain an exhaustive experience on this kind of treatment.

00378

Acute cava free floating thrombus with iliac vein thrombosis in May-Thurner syndrome: endovascular management

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BACKGROUND: May-Thurner syndrome is the condition of the left common iliac vein being compressed between the right common iliac artery and the associated vertebral body. This condition has been linked to spontaneous episodes of deep vein thrombosis (DVT), especially in women aged 20-50, and it may contribute to the slightly higher tendency to develop left-sided (~56%) *versus* right-sided DVTs. The objective of this case-report is presenting the details of the succesful management of a patient with acute left iliac vein thrombosis and free floating thrombus at Inferior Cava Vein with total endovascular approach.
CASE REPORT: A 30-year-old female presented to the emergency room with acute left leg pain and swelling after 8 hs travel in car. Past medical history not relevant, no history suggestive of hereditary thrombophilia. Prior tobacco use and oral anticonceptive treat-

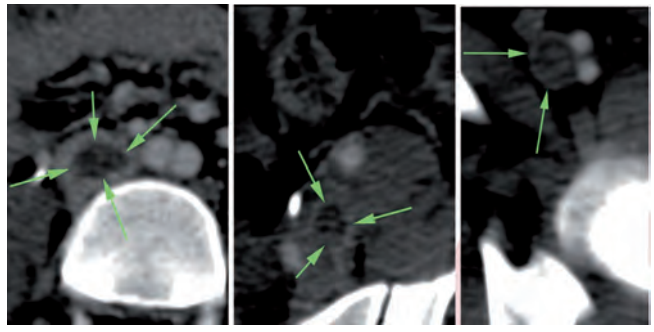

Figure 1.

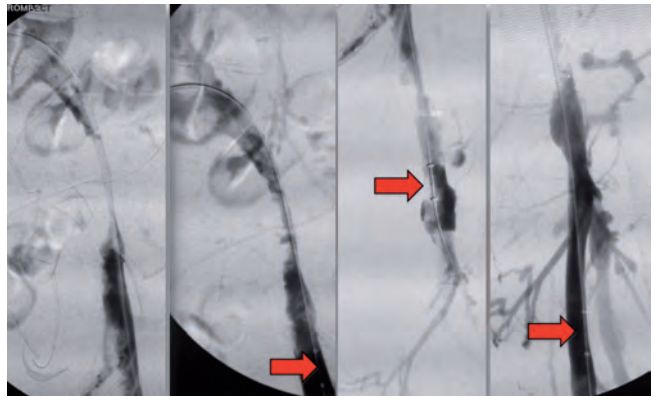

Figure 2.

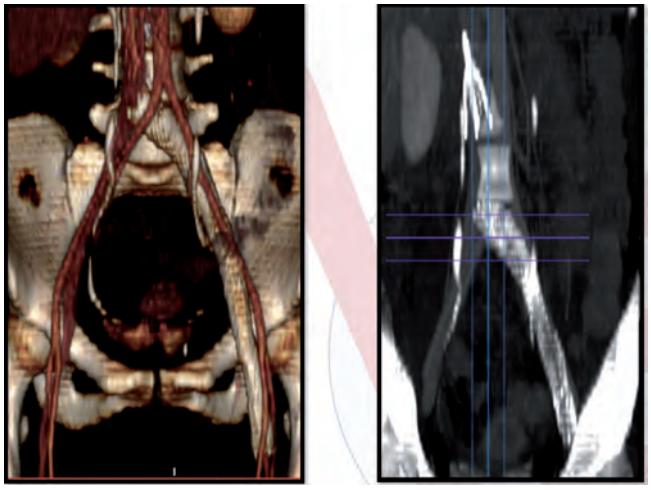

Figure 3.

ment was noted. Patient was admitted and investigated for DVT. Ultrasound Doppler imaging of both legs demonstrated left-sided occlusive DVT in the superficial femoral, common femoral veins with extension into the external and common iliac vein. Imaging in the right leg was unremarkable. Patient was treated with enoxaparin. Angio CT showed left ilio-femoral vein occlusion with a free floating thrombus at inferior cava and compression of the left common iliac vein due to May-Thurner Syndrome. A temporary filter was implanted to prevent proximal embolization during endovascular treatment. With contralateral percutaneous approach the occlusion was crossed from Cava to left popliteal vein and rheolytic thrombectomy was performed with ANGIOJET system and thrombolytic therapy, but control phlebography showed numerous residual stenosis and areas of fibrosis. Vein angioplasty and stenting from common femoral bifurcation to Inferior Cava Vein was performed with excellent results. Two days later control AngioCT showed stents patency with no evidence of thrombus at the iliac veins, neither at Inferior Cava or at the Cava filter. Temporary filter was removed without incidences 72 hs after the procedure. After an uneventful recovery, the patient was discharged on oral anticoagulation and antiplatelet therapy. At 2 years follow-up the patient remains asymptomatic and Doppler US showed stents patency and adequate flow and no re-estenosis data.
In patients with symptomatic deep veins thrombosis, high risk of pulmonary embolisms and findings that suggest the diagnosis of May-Thurner síndrome endovascular therapies with reolitic thrombectomy, angioplasty and venous stenting should be considered as a reasonable first line approach.

00400

The impact of Hydrostatic Compression (HC) on venous morphology and reflux in patients with CVD. The Underwater Vascular Investigation and Compression Group

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BACKGROUND: Chronic venous disease (CVD) is the result of venous reflux, obstruction or a combination of both. Quality of life (QoL) in patients with CVD treated with different treatment modalities at 6-month follow-up demonstrates that despite undergoing therapy, the subsequent QoL scores did not improve significantly, indicating that CVD continued to negatively affect the patient's life. A cheap, well tolerated and effective way to treat venous reflux in patients with CVD is still lacking. The aim of this pilot study was to assess the technical feasibility of Duplex Ultrasound (DU) in evaluating superficial venous morphology and reflux, during immersion under water. The Hydrostatic Compression (HC) obtained by immersion of the legs into a pool is considered beneficial, cheap, painless, well tolerated and presents an ideal model of compression of legs with venous insufficiency. This is because it provides radial pressure directly, without a tension interface of elastic stockings. No study so far by DU has evaluated, the effects of HC on venous morphology and flow.
METHODS: A pool was specifically built to perform DU investigations. One side of the pool was assembled by a tempered crystal glass in order to allow the investigators to visualise directly the legs of the patients undergoing vascular investigation inside the pool. In this pilot study, 6 legs, 5 great saphenous veins (GSV) and 1 small saphenous vein (SSV), CEAP class (C2 = 4, C3=1, C4= 1), of 2 females and 1 male volunteer, had their deep and superficial veins scanned at the standing position with echo colour Doppler. The venous diameters were: min 6, max 12, mean 6.8 mm and the venous reflux duration was: min 3, max 8, mean 4.6 sec. The measurements were performed first out of the water and then in water (34 °C) at a depth of 1.1 meters. Prior to the study, all measuring points were marked on the skin with a permanent ink marker to ensure that the same part of each vein was insonated. Care was taken to apply sufficient ultrasound gel over the skin, to prevent any probe pressure from distorting the vein. Probe-skin contact is not necessary under water because it is an excellent transmission medium. The probe was protected by a water-proof cover filled with US gel when used under water.
RESULTS: The DU is feasible and provides an excellent underwater evaluation of the cutaneous and subcutaneous layers as well as of the superficial and deep venous morphology (shape, calibre) and flow. Hydrostatic compression significantly reduced the diameter of the deep and superficial veins at the thigh and knee. Contrary to expectation, the saphenous venous diameter at the ankle was not reduced by the pressure. There was no reflux to all great and small saphenous veins prior to immersion and under water.
CONCLUSIONS: This study has clearly demonstrated the feasibility of underwater DU evaluation of venous morphology and reflux and shown that HC at a depth of 1.1 meters, significantly reduces deep and superficial venous diameters and eliminates venous reflux. Our findings are the basis for future studies on the effects of HC in patients with CVD.

00311

Left innominate vein pseudoaneurysm: surgical treatment of a rare but relevant complication after central line insertion

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BACKGROUND: Thoracic venous aneurysms are rare pathologies. The reported experience is very limited to some rare case reports. This paper describes surgical treatment of the left innominate vein pseudoaneurysm highlighting the important surgical steps and potential pitfalls when treating this rare pathology.
CASE REPORT: A 73 years-old-woman was admitted to our hospital for severe dyspnea. She was known for moderate tricuspid regurgitation and atrial fibrillation. A transthoracic echocardiography showed worsening of tricuspid regurgitation and right heart failure with important bilateral pleural effusion and severe inferior limb edema. The routine computed tomography examination also incidentally showed a superior mediastinal mass (3 x 3 x 6.5 cm). This mass was homogeneously enhanced by contrast and adjacent to the left innominate vein identified as left innominate vein pseudoaneurysm. The patient had a left jugular vein catheterization 10 years ago and this pathology was most probably secondary to that intervention. Progression of tricuspid valve regurgitation with worsening signs of right heart failure set the indication for surgical tricuspid valve repair with concomitantly cure of the left innominate vein pseudoaneurysm. After femoro-femoral cannulation, due to close proximity between the manubrium and the pseu-

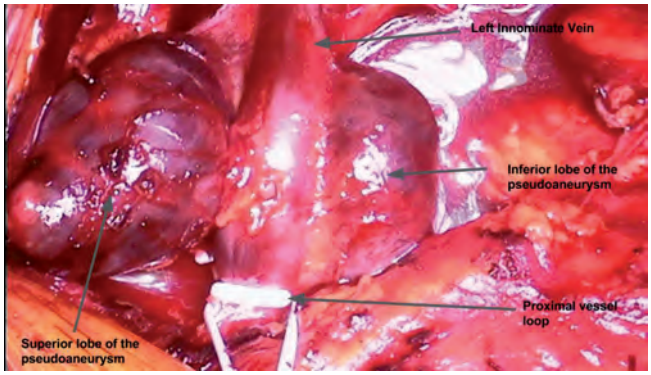

Figure 1.

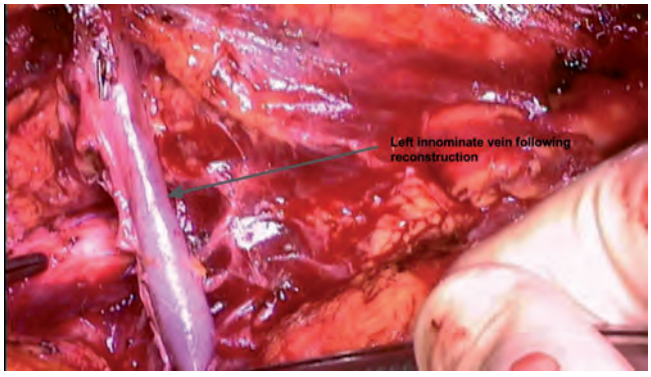

Figure 2.

doaneurysm, careful median sternotomy by using an oscillating saw was performed. We found a bilobular saccular pseudoaneurysm above and below of the innominate vein. The left innominate vein was extensively mobilized and retracted on either end by two vessel loops. The aneurysm was completely freed from adjacent tissues and entered via its posterior aspect. Next the superior and inferior saccular lobes of the pseudoaneurysm were both resected and the communicating neck was repaired by continuous running suture technique using 5-0 Prolene. The operation was completed by annuloplasty of the tricuspid valve (size 32) supplemented by a central clower stitch.
RESULTS: Intraoperative histology confirmed the diagnosis of a pseudoaneurysm of the left innominate vein. No signs of malignancy were reported. The patient's postoperative course was uneventful with hospital discharge at 10th post-operative day. The patient remains well 2 months after surgery.
CONCLUSIONS: The superior mediastinal vein aneurysms are rare clinical entities. It is important to keep this rare pathology in mind because it may mimic other pathologies of the anterior mediastinum, such as thymomas. The reported knowledge is very limited to a few case reports, therefore sharing our surgical expertise, contributes to a better understanding and ease of surgical planning for patients with innominate vein pseudo aneurysm.

00029

Mean platelet volume (MPV) as a predictor of venous thromboembolism (VTE) in colorectal cancer

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BACKGROUND: To investigate the role of mean platelet volume (MPV) in venous thromboembolism (VTE) and colorectal-cancer. Platelet activity is a major devilish in atherothrombotic events and cancer. Mean platelet volume (MPV), which is widely available as a routine parameter of the complete blood count, is a potentially useful biomarker of platelet activity in the setting of venous thrombosis. Recent studies showed that high-MPV levels associated with a increase VTE risk in cancer
METHODS: A retrospective study was performed to analyze differences of MPV between patients with VTE, VTE and colorectal-cancer, and control. Two reviewers independently extracted data for meta-analysis. Differences in MPV were expressed as unstandardized mean difference. Mean platelet volume (MPV) is an accurate measurement of the size of platelets. When measuring complete blood count (CBC), the MPV is routinely measured and reported by the Autoanalyzer. A typical range of platelet volumes is 9.7-12.8 fL. The continuous variables were expressed as mean ± standard deviation while the categorical variables were expressed as number and percentage (%). Normally distributed variables were compared across groups by means of student t test. The non-parametric variables were compared using the Mann-Whitney U test. Logistic regression analyses were performed to rule out the confounding effect of imbalance clinical features between two groups. Categorical variables were compared via Chi-square test. A P-value < 0.05 was considered to be statistically significant. Odds ratios and 95% confidence intervals were estimated by logistic regression.
RESULTS: Among 170 patients, 58-control, 54-VTE, and 58-VTE with colorectal-cancer, MPV was significantly higher in VTE groups. From 403 articles, 10 studies (5 cohorts and 5 case-controls) comprising 2,265 patients. MPV was significantly higher in those with VTE (mean difference 0.61 fL,95%CI 0.34-0.88,P< 0.001). Elevated MPV increased the relative risk of VTE (RR 1.319, 1.061-1.641,I2=82.5%).
CONCLUSIONS: Prior studies support that MPV is a measure of platelet activity. Larger platelets are metabolically and enzymatically more active than smaller platelets, containing more pro-thrombotic material with increased thromboxane B2 and glycoprotein IIb /IIIa receptor expression. Larger platelets possess greater aggregability in response to ADP and decreased inhibition of aggregation by prostacyclin *in vitro*. Larger platelets are denser which contain more alpha granules, which release prothrombotic factors. Our evidence suggests that elevated MPV is associated with VTE and VTE with colorectal-cancer. A mechanistic study and RCT are required in order to use antiplatelet therapy.

00012

A comparison of N-butyl cyanoacrilate, radiofrequency ablation and endovenous laser ablation in the treatment of varicose veins: 2-year follow-up results

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Kahramanmaras Sutcu Imam University Faculty of Medicine, Department of Cardiovascular Surgery, Kahramanmaras, Turkey

BACKGROUND: To compare early-period and 2-year results for N-butyl cyanoacrylate (NBCA), radiofrequency ablation (RFA) and endovenous laser ablation (EVLA) in the treatment of varicose veins.
METHODS: 456 patients with saphenous vein insufficiency between November, 2014, and June, 2015, were divided into three groups and underwent endovenous ablation. NBCA was applied to the 168 patients in Group 1, RFA to the 149 patients in Group 2 and EVLA to the 139 patients in Group 3. Patients were followed-up for 2 years. The primary endpoint was the rate of occlusion of the saphenous veins, and secondary endpoints were patients' quality of life, peri- and post procedural pain, complications observed and time to return to work.
RESULTS: Occlusion rates in all three groups were similar immediately after the procedure and at 6 months, 1 year and 2 years (Figure 1). However, periprocedural pain was significantly lower in the NBCA group (Figure 2). In terms of complications, there was no variation between the groups regarding deep vein thrombosis, bleeding and phlebitis. However, ecchymosis was significantly higher in the RFA group

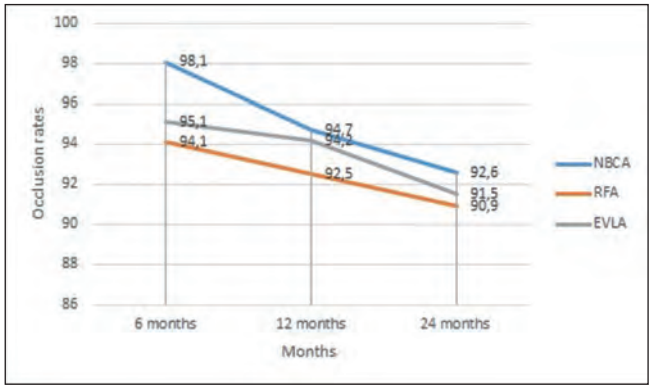

Figure 1.

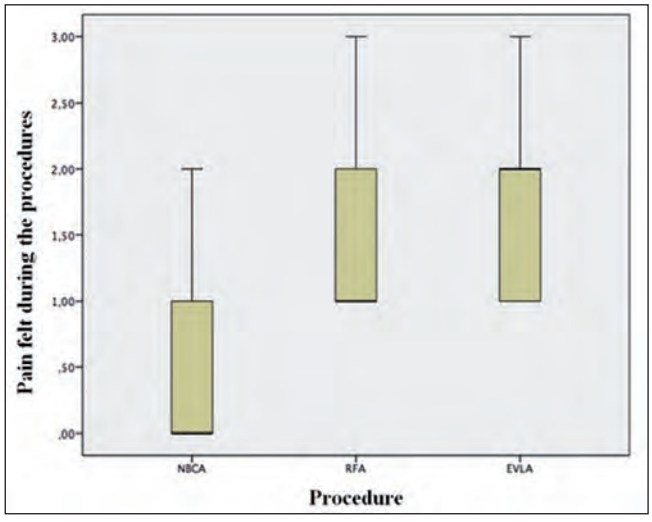

Figure 2.

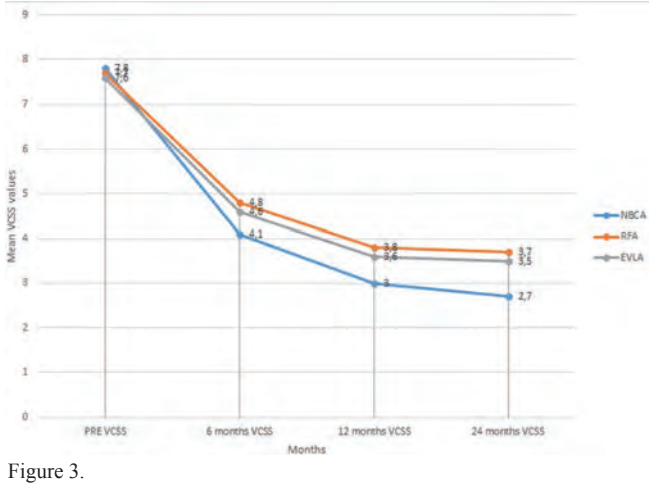

Figure 3.

than in the other groups. While no significant variation was determined between the groups in terms of postoperative analgesic consumption, patients' times to return to work differed, the shortest being in the NBCA group. Pre-procedural venous clinical severity scores (VCSS) values were the same in all groups but began falling in all groups after the procedures (Table I). However, the greatest decrease was in the NBCA group (Figure 3).

Table I.—*Numbers of postoperative analgesics used and patients' times to return to work.*

	Group 1	Group 2	Group 3	p
Number of analgesics used				0,147
1	63 (7,5%)	51 (34,2%)	34 (24,5%)	
2	81 (48,2%)	71 (47,7%)	78 (56,1%)	
3	24 (14,3%)	27 (18,1%)	27 (19,4%)	
Days of return to work				0,000
1	161 (95,8%)	75 (50,3%)	105 (75,5%)	
2	7 (4,2%)	53 (35,6%)	24 (17,3%)	
3	0 (0,0%)	20 (13,4%)	10 (7,2%)	
4 or later	0 (0,0%)	1 (0,7%)	0 (0,0%)	

CONCLUSIONS: While there was no difference in terms of occlusion at 2-year follow-up in groups treated with NBCA, RFA or EVLA, NBCA is superior in terms of patient comfort.

SESSION: CARDIAC ABSTRACT SESSION III: INFECTION OF STERNUM AND ANTERIOR THORACIC WALL

TIME: 17:00-18:00

ROOM 1: FRANCE

00158

Sternal wound infection, risk factors and outcome: our experience

E. Prifti [1], M. Bonacchi [2], K. Mekshi [1], G. Giunti [2], A. Baboci [1], K. Krakulli [1], D. Pellumbi [1], A. Veshti [1]

[1]Division of Cardiac Surgery, University Hospital Center of Tirana, Tirana, Albania; [2]Department of Cardiac Surgery, University of Florence, Florence, Italy

BACKGROUND: Deep sternal wound infection (DSWI) is a serious complication of cardiac surgery. The risk factors of DSWI and the outcomes of the surgical treatment were reported.
METHODS: From December1997 to April 2017 DSWI developed in 50 patients our of 8000 patients undergoing cardiac surgery in a single surgical team experience. (incidence 0.6%), and follow-up was obtained on 95% of these patients. The mean age was 68±12.5 years old. 35 patients were males. 27 were underwent coronary revascularization procedure, 5 underwent coronary revascularization and aortic valve replacement, 7 patients underwent coronary revascularization and mitral valve repair or replacement, one patients underwent aortic and mitral valve replacement, ascending aortic replacement and tricuspid valve repair, 3 patients underwent aortic dissection repair, 5 patients underwent underwent aortic and mitral valve replacement, one patient underwent triple valve replacement, one patient underwent left ventricular aneurysm repair. 11 patients were undergoing reintervention.
RESULTS: 6 patients died due to DSWI (11%). Surgical debridement under total anesthesia was employed in all cases. Pectoralis flap repair was employed in 10 patients and abdominal in 2 patients. In other 38 patients the surgical debridement was performed associated with Robicscek procedure. An original Albanian system employing vacum system and sterile drapes was employed in 5 albanian patients. In 43 patients the DSWI was associated with the superficial wound infection. In two patientsp empyema was identified. Continuous betadine (1%) local infusion was employed in 45 patients during the first 48-72 hours after reoperation for surgical debridement. When we analyzed the predictors for development of DSWI in all patients 50 patients *versus* the other patients not developing DSWI, were (odds ratios and 95% confidence intervals in parentheses) (1) diabetes mellitus (2.8; 1.8 to 4.3) (p=0.002), (2)male sex (2.4; 1.4 to 4.0)(p=0.022), (3)postoperative multi organ failure (2.5; 1.3 to 4.9) (p=0.007), (4)age more than 72 years (3.0; 1.4 to 8.4) (p<0.001) and (5)preoperative IABP (2.7; 1.2 to 8.2) (p<0.001). Bilateral inter-

nal thoracic artery grafts increased the risk in diabetics and chronic obstructive pulmonary disease patients (3.4; 1.4 to 7.6) (p=0.004). The laboratory examination revealed Staphylococcus aureus (23), Enterobacter cloachae (14), Pseudomonas aeruginosa (4), Klebsiella marcescens (3), Escherichia coli (1), Bacteriodes (2) and in 3 other cases not identified. All patients were treated with the antibiotics therapy according the antibiograms. The 12-month freedom from adverse event rate (reoperation, or death) was 72%. The predictors for overall death in the group of DSWI was uncontrolled diabetes (p=0.03), and low cardiac output (p=0.01).
CONCLUSIONS: Diabetes, male sex and age are predictors of DSWI in all cardiac surgical patients. Bilateral internal thoracic artery grafting may be contraindicated in patients with diabetes and chronic obstructive pulmonary disease. The relationship between preoperative intraaortic balloon pump and postoperative multi organ failure and DSWI is probably due to mediastinal tissues hypoperfusion.

00284

Has the modern treatment of deep sternal wound infection brought real survival benefit to patients after cardiac surgery?

M. Simek [1, 2], K. Langova [3], M. Kalab [1, 2], J. Konečný [1], R. Hájek [1], B. Zalesak [4], V. Lonsky [1, 2]

[1]Department of Cardiac Surgery, University Hospital Olomouc, Olomouc, Czech Republic; [2]Medical Faculty of Palacky University Olomouc, Olomouc, Czech Republic; [3]Department of Biophysics, Medical Faculty of Palacky University Olomouc, Olomouc, Czech Republic; [4]Department of Plastic and Aesthetic Surgery, University Hospital Olomouc, Olomouc, Czech Republic

BACKGROUND: We sought to evaluate clinical outcomes, long-term survival, and costs analysis of two different treatment modalities of deep sternal wound infection (DSWI), negative pressure wound therapy (NPWT) and closed irrigation (CI).
METHODS: Retrospective analysis of 147 patients treated for DSWI at our institution. A total of 37 patients (February 2002 through September 2006) underwent primarily CI, and 110 patients (November 2004 through December 2016) had NPWT. Clinical outcomes were compared, focusing on therapeutic failure rate, in-hospital stay characteristics and long-term survival of both treatment strategies. Furthermore, costs analysis including comparison of local sternotomy wound care and overall DSWI management has been proceeded.
RESULTS: NPWT was associated with a significantly lower failure rate of primary therapy (6.4 vs. 32.4%, P<0.001), comparable ICU-stay (20.3±25.0 vs. 14.6±14.4 days, NS) and in-hospital stay (43.2±21.9 vs. 46.8±27.5 days, NS) but with a significant increase of the overall length of therapy (18.4±14.1 vs. 12.4±9.2 days, P<0.01), and number of all dressing changes (6.7±4.4 vs. 4.2±6.3, P<0.001) compared to CI. Insignificant 30-day DSWI-adjusted mortality was recorded (2.7 vs. 5.4%, NS) between both groups, however NPWT was associated with a significant reduction of 3-month (9.1 vs. 21.6%, P<0.05) and 1-year DSWI-adjusted mortality rate (12.7 vs. 27%, P<0.05). The actuarial survival rate at 1 year, 5 years, and 10 years was 77.3%, 72.4%, and 48.6% in the group of NPWT and 64.9%, 56.,8%, and 22.4% in the group of CI (P<0.01). Both treatment strategies have carried comparable risk of chronic fistula formation (12.7 vs 16.6%, NS) within 10-years follow up. Even through increase in local wound management (538±354 vs. 232±209 €, P<0.05) and final sternotomy wound reconstruction costs (1,438±1503 vs 151±72 €, P<0.01), NPWT has not significantly boosted total DSWI management expenses in comparison with CI (34,114±29,127 vs. 27,260±22,267 €, NS).
CONCLUSIONS: NPWT is a superior method of treatment for DSWI in cardiac surgery, which is based on lower therapeutic failure rate and significant decrease of 1-, 5-, 10-year mortality rate in comparison with CI. NPWT is linked with the significant increase of wound bed management and final sternotomy wound reconstruction costs, but it does not significantly boost total DSWI management expenses in comparison with CI.

SESSION: CARDIAC ABSTRACT SESSION IV: CARDIAC ARRHYTHMIAS, MINIMAL INVASIVE & INFECTIOUS DISEASES

TIME: 16:30-18:00

ROOM 4: COLMAR

00312

The convergent procedure: a hybrid approach for long lasting persistent atrial fibrillation ablation: the French experience

K. Zannis [1], A. Wissam [2], F. Sebag [1], T. Folliguet [3], J. Ternacle [2], E. Bergoend [2], D. Hamon [2], N. Lellouche [2]

[1]Institut Mutualiste Montsouris, Paris, France; [2]Hôpital Henri Mondor, Assistance Publique Hôpitaux de Paris et INSERM U 955, Créteil, France; [3]Centre Hospitalier Régional Universitaire Brabois Université de Lorraine, Vandoeuvre les Nancy, France

BACKGROUND: Atrial fibrillation (AF) is associated with increased risk of stroke, heart failure and all-cause mortality. Surgical treatment of AF using the Cox-Maze procedure, is the most effective approach to ablate persistent AF but is associated with significant morbidity and mortality. Additionally, the classical endocardial ablation approach has limited efficacy to treat long lasting persistent AF. With the present study we describe our experience with a minimally invasive hybrid approach, combining an endocardial and epicardial ablation named convergent procedure for treating long lasting persistent AF patients.
METHODS: Fifty-five consecutive patients (52 male, 95%) with long lasting persistent AF (mean time in AF 7 years ± 14.4 months) who underwent the convergent procedure in 2 French centers between 2010 and 2015, were included prospectively, in the present study. All patients included had at least one previous failed endocardial ablation and had a highly symptomatic AF. The epicardial part of the procedure was carried out initially. A transdiaphragmatic pericardial window was created endoscopically. For this purpose, a subxiphoid incision of approximately 15mm was performed. A pericardioscopic cannula and a 5mm, 0° endoscope was inserted in the pericardium. The LA posterior wall was visualized. A radiofrequency suction ablation device was then inserted. The totality of the posterior LA wall from the left to the right pulmonary veins was first ablated. Ablation was completed by epicardial lesions over the anterior surface of right and left PVs. Endocardial ablation was then performed throw a classic transeptal puncture. Patients with a history of thoracic surgery were excluded from the study. A 24 hour-Holter ECG was performed systematically at 3, 6 and 12 months after the convergent procedure. All patients reached 1 year follow-up.

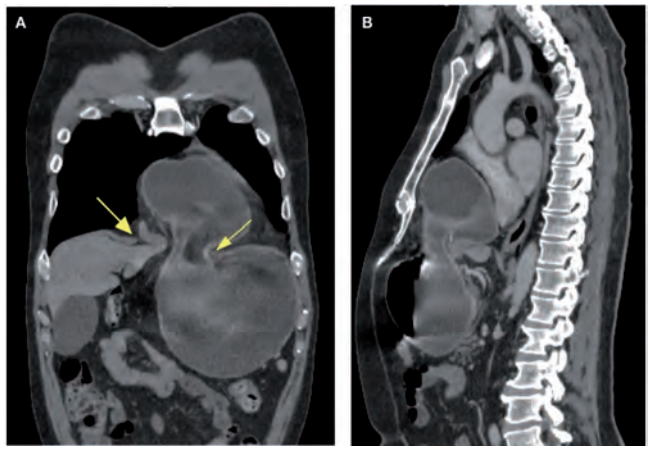

Figure 1.

RESULTS: No death, stroke, phrenic nerve palsy or tamponade occurred immediately after the procedure. Post-surgery average length of stay was 8±4 days. During follow-up 3 patients (5%) developed diaphragmatic hernia (Figure 1) resulting in a modification of the surgical technic. At 12 months, 76% of patients were in sinus rhythm without any documented arrhythmia after an average of 1.43 endocardial ablation procedures. Finally, 91% of patients were maintained on antiarrhythmic drugs.
CONCLUSIONS: The convergent technique combining a thoracoscopic epicardial ablation associated with an endocardial ablation, proved to be effective and safe to treat long lasting persistent symptomatic AF patients with previous failed endocardial AF.

00354

Surgical outcome of aggressive mitral valve repair in native mitral valve endocarditis: a single surgeon experience

Z. Haidari, S.E. Shehada, D. Wendt, F. Mourad, K. Tsagakis, M. Thielmann, H. Jakob, M. El Gabry

University Hospital Essen, Essen, Germany

BACKGROUND: Mitral valve repair (MVR) is the treatment of choice in mitral valve disease requiring surgery with proven excellent outcomes. However, MVR in native acute mitral valve infective endocarditis is technically challenging due to tissue destruction. We report the outcomes of patients with acute mitral valve endocarditis undergoing mitral valve surgery with aggressive indication towards MVR.
METHODS: Between January 2016 und December 2017, a total of 46 39 consecutive patients with acute native mitral valve infective endocarditis underwent mitral valve surgery by a single surgeon. In In 355 (7690%) patients, MVR was applied and MVR was possiblein only 4 (10%) patients mitral valve replacement was necessary due to additional severe calcifications of the mitral valve apparatus. Concomitant aortic and/or tricuspid valve infective endocarditis was present in 6 and 2 patients, respectively. Concomitant coronary artery bypass graft surgery was necessary in 4 patients. In one case an additional cardiac device endocarditis was present. In 35 (76%) patients, MVR was possible. Mean age at operation was 58 years. Mean time between the diagnosis and the operation was 17 days. The main indication for surgery was the presence of large or mobile vegetation in 23 patients, of which 15 patients with stroke related to endocarditis. The median EuroSCORE II was 3,46 (1,8-10,9). Prospectively collected clinical data were retrospectively analyzed for mortality, durability of mitral valve repair using echocardiography, and the incidence of recurrent mitral valve endocarditis.
RESULTS: Patients (age 58±13 years [mean±SD], 26% female) presented with a EuroSCORE-II of 9.0±11.3% on average (median 3.4%). The mean time between diagnosis and surgery was 17±13 days. The indication for surgery were large (>10mm) or mobile mitral valve vegetations in 27 (69%) patients. 15 (38%) patients presented with a history of stroke related to infective endocarditis. After removal of the vegetations, MVR was performed with limited resection of the infected tissue, and with chordal replacement using chordae transfer or artificial chordae. Additionally, annuloplasty was performed in all patients except one. Mean intensive care and hospital stay were 8±10 and 17±10 days, respectively. All-cause mortality was 11% (4/35) at 30 days and 23% (8/35) at a mean follow-up of 9±6 months. Follow-up echocardiography was available in all patients. The left ventricular function remained unchanged (LVEF: 52±11% preop. *versus* LVEF: 53±9% postop.). None to trace mitral regurgitation was present in 16 patients, and mild regurgitation in 12 patients. Follow-up, a re-endocarditis of the repaired mitral valve occurred in 2 patients. Both underwent successful mitral valve re-repair.
CONCLUSIONS: Aggressive indication for MVR is reasonable in patients with acute native mitral valve infective endocarditis with acceptable mortality, and excellent durability even in complex repair.

00322

Transit time flow measurement (TTFM) and high frequency ultrasound epi-cardiac imaging to guide coronary artery bypass surgery

D. Wendt [1], R. Machulla [1], P. Marx [1], S.E Shehada [1], E. Demircioglu [1], F. Mourad [1], K. Tsagakis [1], A. Demircioglu [2], M. Thielmann [1], H. Jakob [1], M. El Gabry [1]

[1]Department of Thoracic and Cardiovascular Surgery, West-German Heart and Vascular Center Essen, University Hospital Essen, Essen, Germany; [2]Institute of Diagnostic and Interventional Radiology and Neuroradiology, University Hospital Essen, Essen, Germany

BACKGROUND: Transit-time flow measurement (TTFM) should be routinely used in coronary artery bygass surgery to verify graft function. Most recently, a 2 D high frequency ultrasound (HF-US) epi-cardiac imaging probe has been released (MiraQ□, Medistim, Oslo, Norway), which allows to morphologically evaluate the cannulation and / or clamping site of the aorta and to evaluate the completed anastomosis. Therefore, the combined use of transit-time flow measurement and high frequency ultrasound might increase intraoperative accuracy in graft patency verification. The aim of the present study was to evaluate the intraoperative combined use of transit-time flow measurement and high frequency ultrasound in regard to postoperative troponin-I levels and in view of surgical strategy-changes based on such findings.
METHODS: A total of 65 consecutive patients undergoing coronary artery bypasssurgery were evaluated. The target vessels, the clamping / cannulation site and the anastomosis were evaluated by high frequency ultrasound. Transit-time flow measurement was performed on all grafts and the mean flow (mL / min) and pulsatility indices (PI) were recorded. Troponin-I levels (ng / L) were obtained within the first 4 postoperative days.
RESULTS: A total of 3.3 ± 0.9 grafts were performed, with 98.5 % left internal mammary artery use and a sequential graft was performed in 55.4 %. The mean pulsatility indices and flows (mL / Min.) were 2.3 ± 2.7 and 70.8 ± 50.6 for the right coronary artery system, 2.4 ± 2.2 and 82.0 ± 47.6 for the circumflex system, and 2.1 ± 1.2 and 78.0 ± 35.0 for the left anterior descending system, respectively. Postoperative troponin-I levels showed a maximum on postoperative day 1. A surgical strategy change, based on imaging, was done in 15 %. Moreover, we observed a correlation of pulsatility indices and flow with maximum postoperative troponin-I levels.
CONCLUSIONS: The present study evaluated the combination of transit-time flow measurementand high frequency ultrasound in coronary artery bapass surgery. Epi-cardiac scanning was helpful to evaluate the potential opening site of the vessel, to evaluate the completed anastomosis or to evaluate the clamping or cannulation site. Troponin-I levels were directly correlated to mean graft flow and pulsatility indices levels.

00347

Efficacy and safety of QPI-1002 for prevention of acute kidney injury following cardiac surgery

D. Corteville [1], R.J. Still [2], G. Szabo [3], M. Swaminathan [4], V. Jayasankar [5], A. Lamy [6], L.J. Lehner [7], M. Thielmann [8], C.D. Brown [9], E.C Squiers [10], U. Schwertschlag [10], A. Potts [10], A. Patel [10], E.K. Messersmith [10], D. Rothenstein [10], D.J. Odenheimer [10], S. Erlich [10]

[1]McLaren Northern Michigan, Petoskey, MI, USA; [2]JCCR, Jacksonville, FL, USA; [3]University of Heidelberg, Heidelberg, Germany; [4]Duke University Medical Center, Durham, NC, USA; [5]Cardiothoracic and Vascular Surgical Assoc, Jacksonville, FL, USA; [6]McMaster University, Hamilton, Canada; [7]Charité Universitätsmedizin Berlin, Berlin, Germany; [8]West-German Heart and Vascular Center Essen, University Duisburg-Essen, Essen, Germany; [9]New Brunswick Heart Centre, Saint John, Canada; [10]Quark Pharmaceuticals, Inc., Fremont, CA, USA

BACKGROUND: QPI, a siRNA targeting p53, is being developed for prevention of Delayed Graft Function (DGF) following renal transplantation (ReGIFT Phase 3 Study, NCT#02610296) and for acute kidney injury (AKI). AKI is a major complication of cardiac surgery (CS) that increases morbidity and mortality. No treatments are approved for the prevention of AKI following CS.

METHODS: The efficacy and safety of QPI, was studied in a global Phase 2 double-blind study (N=341: QPI=165, Placebo (PL)=176) undergoing CS at 41 sites (NCT#02610283). Subjects undergoing non-emergent CS at risk for AKI were enrolled (risk factors included: Age ≥ 70 years; eGFR ≤ 60 mL/min/1.73m2, diabetes, proteinuria, congestive heart failure). Subjects were stratified by eGFR (≥ vs < 60mL/min/1.73m2). A single IV dose of either QPI (10mg/kg) or PL was given 4 hours post-CS. Safety assessments included clinical and laboratory exams and adverse events (AEs). Efficacy endpoints included the rate of AKI determined by serum creatinine according to AKIN (primary), RIFLE and KDIGO (secondary) criteria assessed through Day 5. Secondary endpoints also included duration and grade of AKI, and the composite of death, renal replacement therapy (RRT) and 25% reduction of eGFR at Day 90.
RESULTS: Demographics and AE profiles were similar between treatment groups and consistent with CS. QPI treatment resulted in a 26% relative risk reduction (RRR) of AKI (AKIN): (37% QPI vs. 50% PL; p=0.020). Risk reductions were consistently observed across predefined populations (age, diabetes, CS type, gender, baseline eGFR). Treatment with QPI improved AKI across all AKIN grades (by 18%–61%; p=0.012). Duration of AKIN AKI from Days 0-5 was shorter with QPI (p=0.013). QPI significantly impacted AKI incidence, grade, and duration by RIFLE and KDIGO criteria. The composite of Death, RRT and Reduction of eGFR by 25% at Day 90 favored QPI in a subpopulation (N=241) with either proteinuria, and/or low baseline eGFR, and/or diabetes, (37% QPI vs 51% PL; RRR=29%; p=0.024).
CONCLUSIONS: In this study, QPI reduced the incidence, grade, and duration of AKI in high-risk subjects following CS. Further development of QPI for the prevention of AKI is warranted.

00391

Right mini-thoracotomy in video- and robotic-assisted cardiac surgery, a series of 307 patients

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[1]Institut Mutualiste Montsouris, Paris, France; [2]Rouen University Hospital, Rouen, France

BACKGROUND: Our goal was to assess the safety and efficacy of our minimally invasive cardiac surgery (MICS) program.
METHODS: All patients presenting with a surgical indication for mitral valve repair or replacement, atrial septal defect closure, intracardiac tumor removal, tricuspid valve repair or mitral valve paravalvular leak closure were screened for our MICS program. Risk of pleural adherence, peripheral arterial disease, patient's preference as well as staff and equipement availability were considered in patient's inclusion. The procedures were done through a 4 to 6cm right anterior thoracotomy using endoscopic instruments and camera (video group) or using the Da Vinci Si (Intuitive Surgical, CA) system (robot group). Peripheral extra-corporeal circulation was conducted with an arterial femoral access and a jugular and femoral vein bi-canulation. Both direct aortic and endovascular balloon clamping (Intraclude, EdwardsLifescience, CA) were used. Cardioplegic arrest was obtained with Custodiol (Eusa Pharma SAS, France) perfusion in the aortic root. Body temperature was cooled down to 33°C. Annuloplasty and GoreTex "loop" neochordae were the primary mitral valve repair technique. Other procedures were performed using usual open heart surgery techniques.
Data were collected prospectively during hospitalisation. Patient and their cardiologist were contacted during follow-up. Our study received the local ethics comittee approval.
RESULTS: From 2009 to 2017, 307 patients were treated in our MICS program. Of these, 280 operations were done with video assistance, 27 were robotic cases. Overall, 85% of the procedures were mitral operations of those 80% were repairs. Successful repair rate was 95,4%. The in-hospital mortality was 2,3%, stroke rate was 0,9% and reoperation for bleeding was 9,4%. Conversion to median sternotomy was 2,6%. Lost of follow-up was 10% at five years. The survival and freedom from reoperation was 93% and 82% at this point.
CONCLUSIONS: Robot- and video- assisted minimally invasive cardiac surgery is safe and show good results on a well selected population in a medium sized cardiac surgery center. The learning curve is a significant drawback in the adoption of video and robotic procedures but should improve as teaching through simulation programs will develop in the future.

00369

Coronary artery bypass grafting *vs.* percutaneous coronary intervention in single-vessel LAD disease

Z. Jonjev, M. Golubović, I. Bjeljac, B. Kozić, A.M. Milosavljević

Institute for CVD of Vojvodina, Sremska Kamenica, Serbia

BACKGROUND: Percutaneous coronary intervention (PCI) and surgical direct coronary artery bypass grafting (CABG) are proven therapeutic options for single left anterior descending artery (LAD) disease. The aim of this prospective study was to show immediate and long-term results after such procedures and to compare overall clinical outcomes in propensity score-matched patients.
METHODS: In 2009-2017, there were 266 patients (193 males, 73 females) diagnosed with isolated LAD coronary artery disease at our institution. All patients were operated on as elective cases, and in all cases skeletonized left internal mammary artery (LIMA) was systematically used as in situ graft to revascularize LAD. Patients were compared in propensity score matched fashion with 672 similar patients (493 males, 179 females) who were treated with PCI were sirolimus-eluting stents were used. We analyzed overall immediate and long term results between these two groups in the meaning of Major Adverse Cardiac and Cerebrovascular Event (MACCE) and overall mortality rate.
RESULTS: Increased incidence for postprocedural MACCE after PCI was recorded (CABG=1.2% vs. PCI=5.7%). There was no difference in incidence of stroke and overall mortality (30 days) between the groups. Patient after PCI had shorter length of hospital stay (CABG=7.7 days vs. PCI=3.8 days) after procedure. At 8 years after procedure significant reduction in MACCE was recorde in CABG group (40.4% vs 53.2%; p<0.0001), including cardiac death (8.3% vs 12.2%; p=0.005), myocardial infarction (7.8% vs 13.7%; p<0.005), and repeat revascularisation (20.7% vs 45.3%; p<0.0001).
CONCLUSIONS: The results of the study indicated that CABG performed at the time of myocardial revascularization in single vessel LAD disease is superior then PCI with sirolimus-eluting stents. Our conclusion is independent of traditionally accepted risk factors incorporated in the EuroScore and/or Sintax score and is exclusively method related.

00280

Thoracoscopic epicardial left atrial ablation for atrial fibrillation

A. Kotsienko, P. Shilenko, M.D. Tsoy, Y. Schneider

FGBU FCVMT, Kaliningrad, Russian Federation

BACKGROUND: As is known, the treatment of persistent atrial fibrillation is not an easy problem. The totally thoracoscopic maze procedure is a highly effective method of treatment atrial fibrillation. Effective method of stroke prevention is exclusion left atrial appendage. This research shows results of the totally thoracoscopic radiofrequency epicardial ablation for long standing atrial fibrillation and efficiency novel tourniquet technique left atrial appendage ligation.
METHODS: From January 2015 to December 2017 72 patients were made totally thoracoscopic bilateral pulmonary vein isolation, roof and floor lesions and additional lines. The average age was 61.5 years (35-77 years). Seven people had a prior stroke. The average volume left atrium was 148.6 ml. 64 (91,7%) patients were with persistent atrial fibrillation. 6 (8,3%) with paroxysmal. 9 (17%) were made earlier endocardial ablation of pulmonary veins. In 53 patients from the whole group, for exclude left atrial appendage, we have made thoracoscopic tourniquet left atrial appendage ligation. 10 operations were performed using one ligature. In 43 cases, two ligatures were applied. Ligation was carried out under the TEE control. Was made periodic holter monitoring for determing freedom from atrial fibrillation. After the operation, a series CT for completeness control were performed.

RESULTS: By December 2017 we have got 90-days results freedom from atrial fibrillation from 61 patients with efficiency 87%. Rhythm of 12 patients were evaluated after 2 years (off antiarrhythmic drugs). In this group sinus rhythm was marked in 100% cases because of hybrid technology in two patients. Of all patients, hybrid treatment was used in 10 cases. In 8 cases was left atrial flutter and in 2 cases right atrial flutter. There was a pneumothorax in 2 cases such as complication of the surgery. There was no operative mortality, no myocardial infarction, and no stroke. In the group with one ligation, in three cases an incomplete left atrial appendage ligation was detected. In the group with two ligatures, the left atrial appendage was not contrasted. In one case, a residual stump of 8 mm in length was detected.
The average time of left atrial appendage ligation was 15 minutes. After 3 months, a morphological picture has not changed in any patient, according CT results.
CONCLUSIONS: The totally thoracoscopic epicardial left atrial ablation is highly effective method in treatment atrial fibrillation with low operative risk. a new method for excluding the left atrial appendage showed high safety with an efficiency 96.5%. This technique is applicable to various methods of minimally invasive surgery, not too hard to apply.

00122

The role of LA's diameter in revival of sinus rhythm during mitral valve correction

K. Pukas, I. Leoshko, V. Popov, O. Rybacova

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BACKGROUND: Purpose of investigation is to research possibilities of intraoperative renewal of sinus rhythm during mitral valve replacement (MVR).
CASE REPORT: Purpose of investigation is to research possibilities of intraoperative renewal of sinus rhythm during mitral valve replacement (MVR).
METHODS: In analyzed group of 261 patients are included with isolated mitral valve disease who were operated in Institute from 01.01.2009 to 01.01.2017. There were 111 (42,5%) males and 150 (57,5%). females. Average age of patients was 59,3 + 7,3 yy. 89 (34,1%) patients belonged to III NYHA class, 172 (65,9%) patients - to IV class. MVR were performed in all patients. Average being of permanent form of atrial fibrillation was 2,9 + 0,4 yy. Reduction of left atrium`s (LA) dilatation was occurred in 139 (53,2%) pts by 3 methods: paraannular plasty of LA (62 pts), triangular plasty of LA (original method) (47 pts) and arch plasty of LA (original method) (30 pts) including ligation (n=27) and resection of LA`s auricle (n=112) in both groups. Operations of left Maze - III-box (n=120) and Maze - IV- box (n=141) were performed in all cases by radio-frequency method + sew-tecnique. Operations were done in conditions of moderate hypothermia (32-34° C), retrograde crystalloid cardioplegia (Custadiol). Time of cross-clamping was 75,1 + 10,4 min. There were no complications attributed with method of operation.
RESULTS: Among 261 operated patients 5 patient died on a hospital stage (hospital mortality-1,9%) because of pneumonia (n=1), brain damage (n=1), MOF (n=3) . Inotropic support (dobutamine) was in within 3-4 mcgr/min/kg during first 47,5 + 6,2 hours. Duration of staying on artificial lung ventilation was 6,7 + 0,8 hours and in intensive care unit 59,4+ 7,3 hours. Sinus rhythm renewed immediately after taking clamp from aorta in 84,8 %, at discharging was registered on ECG in 80,2 %. In LA`s plasty group (n=139) diameter of LA were decreased at postoperative period: 63,7 + 1,8 (before), 49,3 + 0,9 (after), 51,5 + 0,4 (remote period). Renewal of sinus rhythm in group pts with LA`s plasty was higher, than in alternative group: 85,6% (n=119/139) and 73,7% (n= 90/122) ($p<0,01$). 241 (93,2%) pts were followed during 5 years after operation. In group with renewed sinus rhythm it was retained: 1 year- 97,2%, 2 year- 96,1%, 3 year- 94,7%, 4 year- 93,1%, 5 year- 92,0%,
CONCLUSIONS: MVR with concomitant operation Maze-III,IV allows successfully renew sinus rhythm on a hospital stage and stabilize it well during remote period after operation. Element of left atrium`s plasty with reduction of diameter of LA less than 50 mm is important factor for sinus rhythm renewal.

00257

Minimally invasive mitral surgery through a right vertical axillary minithoracotomy

S. Nicolardi, F. Mangia, G. Scrascia, M. Pano, A. Gallo, L. Amorese, D. Rocco, P. Fellini, A. Scotto Di Quacquaro, S. Zaccaria, C.A. Greco, G. Casali

Unit of Cardiac Surgery, "Vito Fazzi" Hospital, Lecce, Italy

BACKGROUND: Right anterolateral minithoracotomy through the 3rd or 4th intercostal space is the classic approach for minimally invasive mitral surgery. We report our experience with an alternative and more cosmetic minimally invasive port-access through a right vertical axillary minithoracotomy (RVAMT).

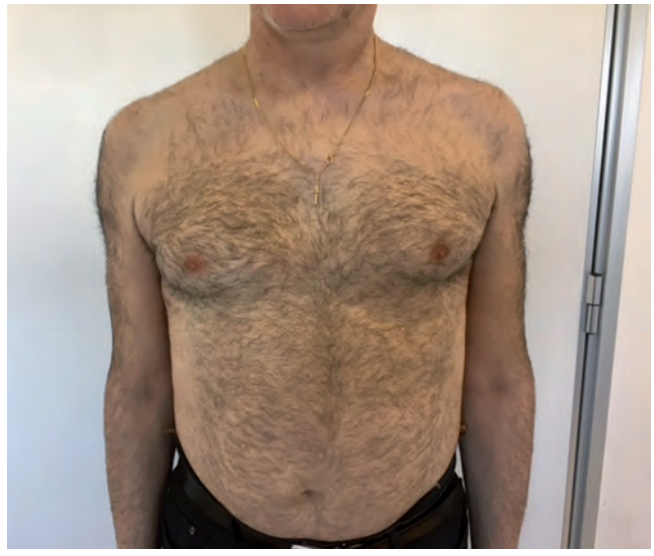

Figure 1.

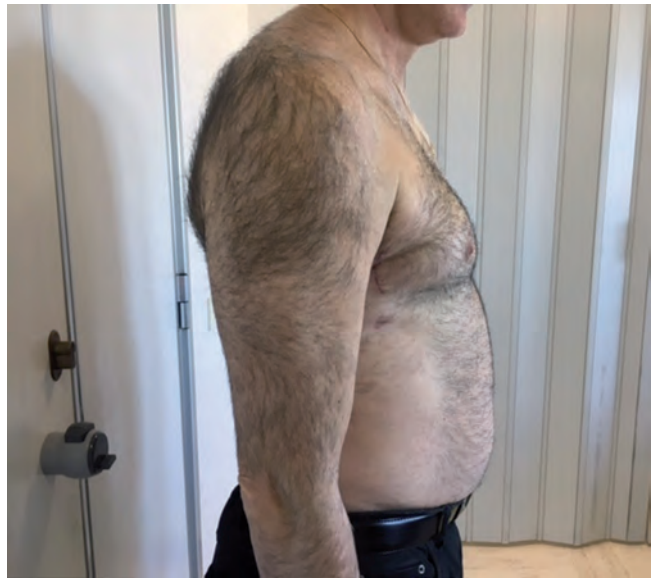

Figure 2.

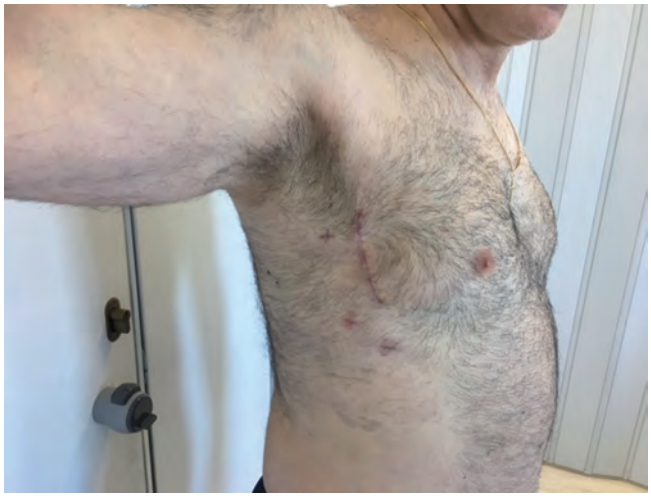

Figure 3.

METHODS: Between July 2016 to January 2018, 53 patients (29 females and 24 males, mean age 65.5 ± 11.4 years) underwent mitral valve surgery through a RVAMT. Forty mitral valve repairs were performed, four associated to tricuspid repair. Only 13 pathological mitral valves have been replaced. RVAMT was performed by a 5-6 cm incision through the 4th intercostal space placed vertically along the anteroaxillary line, rather than transversely via an anterolateral incision along the intercostal space. No endoscopic system was used. Cardiopulmonary bypass (CPB) was established by peripherally arterial and venous cannulation. Chygnet® clamp, inserted through the minithoracotomy, was used for aortic clamping. Cardiac arrest was achieved by anterograde infusion of Custodiol® cardioplegia.
RESULTS: Mean CPB time and aortic cross clamp were 129.3 ± 26.9 minutes and 89.4 ± 17.0 minutes, respectively. There was no approach-related limitation to surgical exposure. Bleeding requiring surgical revision occurred in one patient with conversion to median sternotomy because of iatrogenic aortic intramural hematoma. Median intensive care unit stay was 24 hours; mean mechanical ventilation time was 8.4 ± 5.8 hours; median hospital stay was 8 days. In-hospital mortality was 1.9% (1/53 patients): an 82-year-old lady, who underwent to mitral valve replacement, died for complications due to pulmonary infection with Klebsiella pneumoniae. All the other patients had an uneventful recovery. Post-operative echocardiography demonstrated good results of repair or replacement of the mitral valve in all patients. Overall survival at 6 months follow-up was 100%.
CONCLUSIONS: RVAMT is a safe alternative, reproducible, cosmetic and minimally invasive approach for mitral valve surgery. It provides an optimal surgical viewing perpendicular to the mitral plane without hemi-diaphragm interposition, adequate mitral valve exposure and surgery under an easier direct vision. The cosmetic advantage of the RVAMT is the short incision under the armpit that is often invisible.

00119

Prevention sick sinus syndrome in patients with the fragmentation operation in left atrium for correction of isolated mitral valve aisease

V. Popov, I. Leoshko

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BACKGROUND: The aim of the study is to study the possibilities of the proposed technique of the auto pericardial nutrient-foot to improve the results of sinus rhythm restoration in mitral valve replacement (MVR) and prevention of sick sinus syndrome (SSS)
METHODS: To a test group included 261 patients with isolated mitral defect stage IV, who were treated from January 1, 2013 to December 24, 2017. The men were 111 (42.5%), women - 150 (57.5%). Age ranged from 39 to 72 years (average 59,3 ± 7,3 years). 89 (34.1%) patients belonged to class III classification NYHA, 172 (65.9%) patients - to class IV. In 255 patients was performed mitral valve replacement. And in 6 patients performed mitral valve repair. Fragmentation in the LA mode held in low-frequency mode (25-35 watts diathermy) on the left option transactions Maze-3,4. In 33 patients (study group) was supplemented implantation operation in the zone sinus of auto pericardial nutrient-foot.
RESULTS: Of the 261 operated patients at the hospital stage died 5 patients (the hospital mortality were:1.9%). In the main group, no one died. In the comparison group (248 patents) the mitral valve replacement in combination with Operation Labyrinth In low-frequency mode allows us to successfully restore the correct rhythm in 76.2% of cases at the hospital stage and stabilize it within six months or a year after the operation. However, Considering the sick sinus syndrome 4 pacemakers (1.5%) ($p < 0,05$) were implanted in the postoperative period. At discharge, the recovery of sinus rhythm in the group of patients with PL plastic was higher than in the alternative group: 85,6% (n = 119/139) i 73,7% (n = 90/122) ($p < 0,05$). Given the sick sinus syndrome, the pacemaker was implanted in 3 (1,2%) ($p < 0,05$) cases at the hospital stage and 1 year after the operation. In the comparison group, the sinus rhythm recovered immediately after the operation in 30 (92.5%) ($p < 0,05$) patients, with an ECG discharge recorded in 30 (92.5%) and in 2 years was noted in 80.0% of cases. sick sinus syndrome does not depend on the water flow.
CONCLUSIONS: The proposed method of implantation and implemented application of a nutrient-foot from auto pericardium the zone sinus simple in execution, no traumatic and simultaneously provides a remarkable clinical results in early and remote postoperative period. The findings nearest remote period allow us to optimistically evaluate the possibility of the proposed method, however, requires the accumulation of clinical material.

00165

The importance of emerging transcatheter mitral valve technologies in cost-effectiveness and post-procedure outcomes

A. Elbardissi, M. Stuntz

Deerfield Institute, New York, NY, USA

BACKGROUND: Mitral intervention has historically been open surgical and has been limited to a small subset of patients who could tolerate surgery and where there was perceived clinical benefit. With the emergence of transcatheter mitral interventions, we sought to compare the types of patients undergoing surgical and transcatheter mitral interventions. Moreover, we sought to determine if there were any major differences in adverse events, length of stay (LOS), and cost to the healthcare system.
METHODS: The Nationwide Inpatient Sample (NIS) is the largest publicly available all-payer inpatient healthcare database in the United States, containing a 20% stratified systematic random sample of discharges from all US community hospital discharges. We used data from 2011 through 2014 for this analysis. Transcatheter mitral valve repair (TMVR) procedures were identified using International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM) code 35.97, and open heart mitral valve repair procedures were identified using ICD-9-CM code 35.12. Population sampling weights were used to extrapolate results to national estimates. Patient characteristics were extracted from the database, including demographics (age, sex, race, expected primary payer, and income quartile for patient's ZIP code), hospital characteristics (US geographic region, location and teaching status, and hospital bed size), and 29 Elixhauser comorbidities. We used the van Walraven modification of the Elixhauser comorbidity measures to calculate a single numeric score for disease burden. Univariate between-group differences were analyzed using Pearson $\chi 2$ tests for categorical variables and 2-tailed t tests for continuous variables. Risk-adjusted outcomes for each surgery type were analyzed using a composite variable consisting of in-hospital mortality and major complications, including septicemia, stroke, acute renal failure, gastrointestinal bleed, or myocardial infarction.

RESULTS: From 2011-2014, 2,949 patients underwent TMVR and 67,249 underwent open repair. TMVR patients were significantly older than open repair patients (72.6 years vs 61.7 years, respectively; p<0.001), as well as sicker (van Walraven-Elixhauser comorbidity score 4.8 vs 3.9; p<0.001). Despite consisting of older and sicker patients, TMVR was associated with reduced LOS compared with open repair patients (7.6 days vs 10.5 days; p<0.001) in addition to having lower inflation-adjusted mean hospital charges ($189,658 vs $212,609; p=0.008). After adjusting for specific patient and hospital characteristics, TMVR was associated with significantly lower odds of in-hospital mortality or severe complications than open repair (adjusted odds ratio [OR], 0.62; 95% CI, 0.49-0.78; p<0.001). Analysis of baseline patient and hospital characteristics revealed that age was an independent predictor of in-hospital mortality or severe complications in patients undergoing open surgical intervention (>60 years old, OR 1.88, 95% CI; 1.71-2.08; p<0.001). Age was not a significant predictor of outcomes in patients undergoing TMVR (>60 years old, OR 0.80; 95% CI, 0.49-1.29; p=0.359). Hospital location and teaching status was the only significant predictor outcomes in patients undergoing TMVR, with urban teaching and non-teaching hospitals having superior outcomes vs. rural hospitals (OR, 0.30; 95% CI, 0.24-0.37; p<0.001).
CONCLUSIONS: Despite improvements in surgical outcomes, interventional mitral valve procedures have a superior cost and clinical benefit profile. The safety benefit is even more pronounced in patients greater than 60 years old which have increased risk of mortality and complications with open surgery but not TMVR. TMVR hospital location was the only predictor of outcomes with urban institutions having superior outcomes vs. rural hospitals, suggesting a volume and learning curve effect that has been described in other procedures. Should long-term outcome data confirm the robustness of the therapy, interventional mitral technologies ought to be strongly considered as first line therapy to both improve outcomes and reduce the overall cost burden to the system.

00013

Aortic valve replacement through ministernotomy *versus* medial sternotomy: insight into a prospective randomized study

P. Vukovic [1, 2], P. Milojevic [1, 2], I. Stojanovic [1, 2], S. Micovic [1, 2], I. Zivkovic [1], M. Peric [1, 2], D. Unic-Stojanovic [2, 3], M. Bojic [2, 4]

[1]Department of Cardiac Surgery, Dedinje Cardiovascular Institute, Belgrade, Serbia; [2]Belgrade Medical School, Belgrade, Serbia; [3]Department of Anaesthesiology, Dedinje Cardiovascular Institute, Belgrade, Serbia; [4]Department of Cardiology, Dedinje Cardiovascular Institute, Belgrade, Serbia

BACKGROUND: Minimally invasive aortic valve surgery has emerged during the last decade. However, only few prospective randomized studies analyzed the results of the minimally invasive approach in aortic valve surgery. The aim of this prospective randomized study was to compare the results of aortic valve replacement through median sternotomy and upper ministernotomy.
METHODS: Seventy-six out of 100 patients planed to be enrolled in the study, have been randomized till October 2017. Aortic valve replacement was performed either though upper hemisternotomy (39 patients, 51.3%) or through complete medial sternotomy (37 patients, 48.7%). Intraoperative variables (cross-clamp time, cardiopulmonary bypass time) and operative outcomes (30 days mortality, incidence of surgical revision due to postoperative bleeding, incidence of postoperative myocardial infarction, stroke, acute renal failure and wound infection, postoperative blood loss, ICU stay and hospital stay) were analyzed and two surgical approaches were compared.
RESULTS: There was no difference in 30 days mortality between two groups of patients (2.6% vs 2.7%, p=0.95; ministernotomy vs medial sternotomy respectively). The cross-clamp time was longer in ministernotomy group (70 $\pm$ 14 min vs 52 $\pm$ 11 min, p<0.01). There was no difference in the incidence of postoperative myocardial infarction (0%), stroke (0%), and postoperative acute renal failure (0 vs 2.7%, p=0.48; ministernotomy vs medial sternotomy respectively). One patient in each group underwent surgical revision because of postoperative bleeding (2.6% vs 2.7%, p=0.95; ministernotomy vs medial sternotomy respectively). Postoperative blood loss was insignificantly lower in ministernotomy group (398 $\pm$ 342 mL vs 463 $\pm$ 455 mL, p=0.47). Two patients had wound infection after medial sternotomy: 1 superficial infection and 1 deep sternal infection (0% vs 5.4%, p=0.23; ministernotomy vs medial sternotomy respectively). The length of ICU stay was similar in both groups (2.3 $\pm$ 1 days vs 2.6 $\pm$ 1.6 days, p=0.42; ministernotomy vs medial sternotomy respectevely). Patients in ministernotomy group recovered faster and had shorter hospital stay when compared with patients operated through medial sternotomy (7.7 $\pm$ 1.9 days vs 9.7 $\pm$ 3.4 days, p<0.05).
CONCLUSIONS: No difference in major postoperative outcomes was found when ministernotomy was compared with medial sternotomy. Minimally invasive aortic valve replacement through ministernotomy lead to faster postoperative recovery and shorter hospital stay.

00357

Trends in isolated mitral valve surgery: the changing risk profile of patients and outcomes

A. Elbardissi, M. Stuntz

Deerfield Institute, New York City, NY, USA

BACKGROUND: Open surgical repair has historically been the only corrective procedure for mitral regurgitation. There are few contemporary data examining evolving patient characteristics and surgical outcomes of mitral valve surgery. We sought to characterize trends in patient characteristics and outcomes after isolated mitral valve repair surgery over the past decade in the United States.
METHODS: We used 2003-2014 data from the Nationwide Inpatient Sample (NIS), the largest publicly available all-payer inpatient healthcare database in the United States. Open heart mitral valve repair procedures were identified using ICD-9-CM code 35.12. To ensure a homogenous study population, we excluded patients with mitral stenosis, rheumatic disease, infective endocarditis, or aortic valve disease. We also excluded patients undergoing concomitant procedures, including aortic valve repair, aortic valve replacement, coronary artery bypass grafting, tricuspid valve repair, and tricuspid valve replacement. We used the van Walraven modification of the Elixhauser comorbidity measures to calculate a single numeric score for disease burden. Multivariate logistic regression was used to analyze risk-adjusted outcomes: in-hospital mortality and a composite variable of major complications, including septicemia, stroke, acute renal failure, gastrointestinal bleed, or myocardial infarction. To compare changes in patient characteristics and outcomes over time, we separately analyzed patients undergoing surgery from 2003-2006 *versus* those from 2011-2014.
RESULTS: From 2003 to 2014, 198,623 patients underwent mitral valve repair surgery, of which 97,194 were isolated repairs without concomitant procedures. As a percentage of all surgical mitral repairs, isolated mitral repair increased from 44.5% to 55.2%. Relative to the underlying population, the rate of isolated surgery increased from 2.22 per 100,000 (6,444) in 2003 to 2.90 per 100,000 (9,250) in 2014. In-hospital mortality improved from 2.78% to 0.97%, a reduction of 65%, though the incidence of major perioperative complications increased by over 136% (4.96% vs. 11.73%). Patients undergoing surgery in the late period had significantly higher mean comorbidity scores than those undergoing surgery in the early time period (3.1 vs 1.4; p<0.001) and were significantly older on average (58.4 vs 54.9; p<0.001). Inflation-adjusted mean hospital charges increased significantly from the early period to the late period ($133,106 vs $172,394; p<0.001), despite no change in the average length of stay (8.4 days vs. 8.3 days; p=0.385). Multivariate logistic regression revealed that predictors of major complications or mortality in the early period were age (≥60 years old, OR 1.94, 95% CI 1.37-2.74; p<0.001) and African-American race (OR 1.90, 95% CI 1.20-3.02; p=0.007). In late experience age remained a predictor, though with lower risk than in the early period (≥60 years old, OR 1.46, 95% CI 1.16-1.83; p=0.001), while the risk increased for African-Americans (OR 2.32, 95% CI 1.77-3.03; p<0.001). Overall, patients from the late period had significantly increased adjusted odds of major complications compared with those in the early period (OR 1.44, 95% CI 1.21-1.70; p<0.001).

CONCLUSIONS: Over the past decade, the number of isolated mitral valve repairs has increased significantly in absolute terms and as a percentage of all mitral valve repair procedures. Patients undergoing mitral repair in the current era have significantly more comorbidities than those in the earlier period. Despite improved in-hospital mortality, the incidence of major complications has more than doubled. When adjusting for underlying patient comorbidities, there continued to be a significant increase in major complications. This disparity between improved mortality and worsening complication rate may reflect improvement in perioperative care which offsets mortality at the expense of complications. Although hospital stay remained constant, increased cost likely reflected the increase in complication rate of patients in the later cohort. Further analysis should be done to better understand these changing outcomes.

SATURDAY APRIL 14

SESSION: CARDIAC ABSTRACT SESSION V: CARDIAC INSUFFICIENCY & CARDIAC ASSIST DEVICES

TIME: 08:00-08:30

ROOM 3: STRASBOURG

00139

Paracorporeal biventricular assist device in acute heart failure: Hong Kong experience

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[1]Department of Cardiothoracic Surgery, The University of Hong Kong, Queen Mary Hospital, Pokfulam Road, Hong Kong SAR, Hong Kong; [2]Cardiac Medicine Unit, The University of Hong Kong, Grantham Hospital, Wong Chuk Hang, Hong Kong SAR, Hong Kong

BACKGROUND: Patients requiring biventricular assist device (BiVAD) are generally critically ill in the pre-operative period, which influences the post implant outcome. It has been shown that BiVAD implantation is associated with inferior outcomes. Nonetheless, in this class of rapidly declining patients with potentially reversible contraindication for bridging to other support including heart transplantation, these devices can buy time for native function recovery. Their role in salvaging is particularly important in pediatric patients where donor supply is inadequate. Queen Mary Hospital is the sole provider of ventricular assist device (VAD) and heart transplant services in Hong Kong. We report our experience with CentriMag BiVAD (Thoratec Corp.) as rescue support.
METHODS: Between 2012-2017, twenty patients who received CentriMag BiVAD at our institution were retrospectively analyzed. VAD insertion was performed via median sternotomy with cardiopulmonary bypass in all except one, in which it was done via thoracotomy without bypass. Sixteen received both VADs at the time of initial implantation (planned BiVAD) and 4 received sequential left VAD followed by right VAD support (failed isolated Left VAD) during two separate operations. We studied clinical characteristics and outcomes of patients following implantation of a BiVAD.
RESULTS: The median age at implantation was 43.5 (10-61) years, BSA 1.57 (1.24-1.94) m2, 60% (12/20) were males and 75% (15/20) belonged to Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) profile 1 and 25% (5/20) to profile 2. The cause of heart failure was non-ischemic cardiomyopathy in 10 patients, myocarditis in 7 and ischemic cardiomyopathy in 3. Before implantation, 100% were on at least 1 inotropic or a vasopressor agent, 75% (15/20) had an intra-aortic balloon pump, 60% (12/20) were on extracorporeal membrane oxygenation (ECMO) support, 55% (11/20) required hemofiltration, 50% (10/20) were mechanically ventilated, 45% (9/20) had intractable ventricular arrhythmia or persistent ventricular fibrillation. Median duration of support was 46 (1-235) days. Longest duration of support was 235 days for a 10-year-old boy awaiting heart transplantation. During this time pump head was replaced fifteen times and the boy was kept in intensive care unit. Bleeding occurred in 3 patients (15%) and all required resternotomy. One patient (5%) developed pericardial effusion with tamponade requiring pericardiotomy. Cerebrovascular complications occurred in 4 patients (20%). Of 45% (9/20) who survived to transplantation, 7 survived to discharge (including the 10 year old boy) and were alive at last follow up with median follow up of 44.5 months. 55% (11/20) died on support of which 80% belonged to profile 1 and 18% to profile 2. Kaplan Meier survival post BiVAD implantation at 6 months was 26.7% for profile 1 *versus* 60% for profile 2 patients.
CONCLUSIONS: CentriMag BiVAD is generally used at our institution as a short-to medium-term device to provide circulatory support to a cohort of extremely ill patients. Furthermore, its prolonged use in a pediatric end-stage heart failure patient offered time for a suitable donor to be available. Preoperative characteristics of the patients at the time of BiVAD implantation determine the post implant outcomes. Our findings corroborate the evidence that BiVAD is a viable option for biventricular failure; nevertheless, survival for profile-1 patients is still very poor.

00040

HeartMate 3 assist device as an alternative therapy to the heart transplantation in end-stage heart failure patients

Y. Pya [1], S. Bekbossynov [2], M. Bekbossynova [1], A. Medressova [2], S. Dzhetybayeva [1], R. Salov [3]

[1]National Research Cardiac Surgery Center, Astana, Kazakhstan; [2]Cardiac Surgery Department №2 of the National Research Cardiac Surgery Center, Astana, Kazakhstan; [3]VAD Service, National Research Cardiac Surgery Center, Astana, Kazakhstan

BACKGROUND: Prior to 2011, there was no ventricular assist device (VAD) program and most patients could not afford to travel outside the country for treatment; patients with severe heart failure received medical treatment that helped palliate the disease with limited impact on long term outcomes. In this context, the National Research Cardiac Surgery Center (NRCSC), located in Astana, Kazakhstan, established a mechanical circulatory support program in 2011. With the help of experienced European centers, the NRCSC established the sole VAD program in Kazakhstan providing VAD support to all regions of this, the world's 9th largest country. NRCSC was one of the enrolling centers in the HeartMate 3 assist device CE Mark Study in 2014. Post-approval using of HeartMate 3 started in January 2015 in Kazakhstan. We presented the data of patients with pre- and post-approval HeartMate 3 assist device.
METHODS: During last 3 years 80 patients (75 males, 93.7%) underwent 80 HeartMate 3 left VADs (8 patients were within the CE Mark Study and 72 patients - in the HeartMate 3 post-approval period) in our Center. Mean age was 49 ± 13 years old (16 - 73 yo). The mean duration on left VAD was 534±321 days. Maximum duration of support is 1173 days (patient remains ongoing).
RESULTS: The patients received HeartMate 3 left VAD for BTT (n=52, 65%) and DT (n=28, 35%). Patients were in INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support) profiles 3-4 in most of cases (n=72, 90%). Kaplan-Meier survival estimates for patients with HeartMate 3 assist device were 98.7% after 1 month, 94.4% after 6 months, 90.6% after 1 year, 85% after 2 and 3 years. Survival rate for 53 patients after heart transplantation (6 of them are after HeartMate 3 left VAD implantation) in our Center were 96.2% after 1 month, 86.3% after 6 months, 81.6% after 1, 2 and 3 years. 18 patients (22.5%) experienced right ventricular failure with setting right ventricular assist device only in 1 case (1.25%), driveline infections was observed in 7 patients (8.75%). There have been no hemolysis or pump thrombosis in the patients.
CONCLUSIONS: According to our results HeartMate 3 left VAD can serve as alternative therapy to the heart transplantation in end-stage heart failure patients.

00039

Analysis of 100 HeartMate II left ventricular assist device implantations: Astana experience

Y. Pya [1], S. Bekbossynov [2], M. Bekbossynova [1], A. Medressova [2], S. Andossova [1], M. Murzagaliyev [2]

[1]National Research Cardiac Surgery Center, Astana, Kazakhstan; [2]Cardiac Surgery Department №2 of the National Research Cardiac Surgery Center, Astana, Kazakhstan

BACKGROUND: The National research cardiac surgery center (NRCSC) is the single center in Kazakhstan with the experience of ventricular assist device (VAD) implantations. We report the data of patients with HeartMate II VADs.
METHODS: The NRCSC VAD team uses four devices – the HeartWare HVAD (HeartWare International, Framingham MA, USA), HeartMate II, CentriMag VAD and HeartMate 3 (Abbot, USA), the latter of which was approved for use in "bridge to transplantation" and "bridge to transplantation" in Kazakhstan in 2014. Between November 2011 and September 2017, 99 patients (93 males) received 100 HeartMate II VADs as "bridge to transplantation" (n=59, 60%) or "destination therapy" (n=39, 40%). The underlying heart diseases in most cases were ischemic (n=48, 48.5%) and dilated cardiomyopathies (n=36, 36.4%). 6 patients were in INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support) profile 1 (6.12%), 11 – in level 2 (11.22%), 23 cases – in profile 3 (23.46%), 50 patients – in level 4 (51%) and 8 – in profile 5 (5.2%).
RESULTS: Mean age of patients was 52 ± 12 years old. 12 patients (12%) were transplanted. The mean time on left VAD was 904±580 days (range 8 to 2096 days). Kaplan-Meier survival estimates for patients who continued on left VAD support were 96.8% after one month, 91.5% after six months, 81.6% after twelve months, 63.2% after 2 years and 58.3% after 3 years. The most common complications within the first 30 days after implant included right ventricular failure (n=24, 24.2%) and bleeding (n=9, 9.1%). 3 patients underwent implantation of HeartMate II for left ventricle support and Levitronix CentriMag VAD for right ventricle support. One patient was on right VAD for 147 days, followed by HeartWare implantation for the right ventricle long-term support. Six months after the first surgery, the patient was discharged home. Unfortunately, this patient died after approximately 3 months after the late operation due to pneumonia. Beyond 30 days adverse events included driveline infections (n=46, 46.5%), strokes (n=26, 26.3%) and pump thrombosis (n=17, 17.2%) with 1 case of reimplantation of the left VAD.
CONCLUSIONS: Overall experience with the HeartMate II has been satisfactory with the high rates of survival up to 1 year. Progressive perfection in postoperative management of patients may decrease the adverse events rate and improve the long-term survival.

SESSION: CARDIAC ABSTRACT SESSION VI: TAVI & TRANSCATHETER AORTIC PROCEDURES

TIME: 08:00-09:30

ROOM 1: FRANCE

00064

Antegrade implantation of previously fenestrated stent for arch repair for acute Stanford type A aortic dissection

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BACKGROUND: The best surgical strategy for acute Stanford type A aortic dissection (aTAAD) involving the arch is controversial. Based on the technique as intervention by endovascular, we have used a novel method that antegrade implanting a previously fenestrated stent for arch repair, which have revealed acceptable results.
METHODS: From December 2014 to December 2016, 81 aTAAD patients (52 male, 29 female) underwent ascending aorta replacement and fenestrated stent graft implantation. The indications include: the primary intimal tear was located in the ascending aorta, lesser curvature of the aortic arch, or the descending aorta; the diameter of aortic arch was less than 4cm; the aortic pathology was not Marfan syndrome or other connective tissue disorders. The fenestrated stent graft was implanted into the true lumen of aortic arch and proximal descending aorta with the fenestration opening at the ostia of three head vessels in the arch. The proximal end of the stent graft was anastomosed to the distal end of the Dacron tube graft that replaced the proximal ascending aorta. The perioperative results of all patients were collected and analyzed. All patients had contrast enhanced computed tomography angiography before discharge and during follow up.
RESULTS: The cardiopulmonary bypass time was 213 ± 49 minutes, aortic cross-clamp time was 133 ± 39 minutes, and selective cerebral perfusion and lower body arrest time was 27 ± 8 minutes. There were 5 in-hospital deaths due to circulation failure (mortality 6.2%). Other 5 patients died during follow-up period. The surviving patients had contrast enhanced CT scans in the 3rd, 6th, and 12th months. The flow up CT revealed increasing rate of false lumen thrombosis.
CONCLUSIONS: In conclusion, the arch fenestrated stent graft placement provides extensive repair of the aortic arch and descending aorta can be performed with a relatively low mortality. The fenestrated stent grafts can provide a strong distal aortic stump for ascending aorta anastomosis. Despite the lack of a long term follow-up, this simple technique may improve short-term outcomes of patients who require conventional ascending aorta replacement due to acute type A aortic dissection.

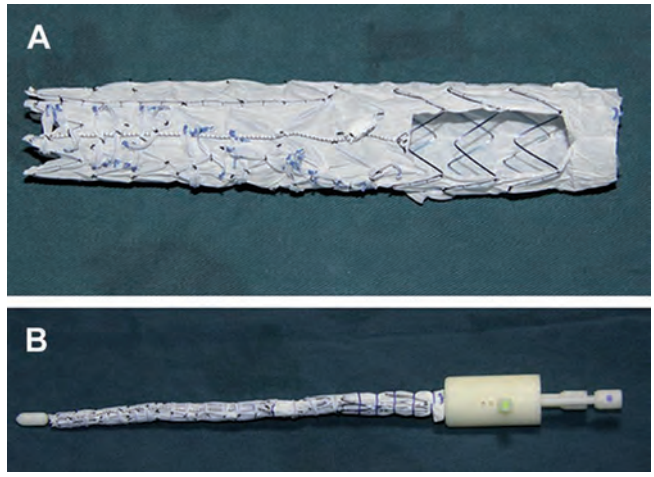

Figure 1.

00262

Residual aortic related risks after radical proximal aortic repair in Type II acute aortic dissection

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BACKGROUND: The DeBakey Classification for acute aortic dissection (AD) involving the ascending aorta and arch but without extension into the descending aorta is not covered by the classic type II definition. For this reason, we slightly modified this type II definition with extension of the dissection to the aortic arch ending at the offspring of the left subclavian artery. These ADs can be completely removed surgically via median sternotomy without leaving residual pathology downstream. This study presents the outcomes of patients operated for modified type II AD and the characteristics of the aorta during follow up.
METHODS: Between 01.2004 and 06.2017, 81 patients (age mean 66 ± 27 years, 35 females) with acute type II dissection underwent

emergency aortic surgery. Radical aortic repair included removal of all dissected tissue within the arch including re-implantation of the arch arteries. Surgery was performed in moderate hypothermia, 24-28°C core temperature, and bilateral selective antegrade cerebral perfusion. During follow up (3, 8 ± 2 years, mean ± SD), 49 patients had complete computed tomography imaging. Residual or new onset of AD, need for re-operation as well as diameter changes distal to anastomosis were evaluated. Kaplan Mayer analysis was adjusted to 5 years.
RESULTS: 37 % and 63 % patients underwent isolated ascending aorta or additional arch replacement respectively. The 30-day mortality was 12 %. The estimated 5 year survival was 72 %. No residual downstream dissection was found. New onset of distal AD was 4 % (3 patients); none after isolated ascending aorta and 3 after additional arch replacement. Anastomotic pseudoaneurysm occurred in 1 patient. Freedom from aorta related re-operation was 99 %. Between first- and last postoperative CT, the aortic diameter beyond the distal anastomosis increased from 29.5 ± 4.3 to 31.5 ± 6 mm (mean ± SD), p<0,001. Diameter increase was 0, 35/mm/year. A diameter increase of more than 5 mm/year did not occur.
CONCLUSIONS: Radical surgical aortic treatment in modified type II AD patients minimizes the risk for residual dissection downstream. Since a low risk for anastomotic aneurysm and new onset of dissection still exists, close FU remains mandatory. Progressive aneurysmal formation beyond the distal anastomosis was not observed. Thus, at least midterm cure from the dissecting process can be documented.

00326

A detailed fluid dynamical analysis of the Trifecta aortic valve prosthesis

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BACKGROUND: Aortic valve stenosis represents the most common valvular heart disease. Even though there was tremendous progress over the last decades (Bioprostheses, TAVI), further developmental enhancements of prostheses are still required. In this context a sophisticated testing of the flow pattern is mandatory for receiving information that are crucial for optimizations. The aim of the present *in vitro* study was the evaluation of the fluid dynamical performance of the Trifecta (SJM, St. Paul, MN, USA) aortic valve prostheses depending on the prosthetic size (21, 23 and 25mm) and the cardiac output (3.6-6.4L/min).
METHODS: All tests were performed with a self-constructed flow chamber that allowed a precise evaluation of the hemodynamic performance of valves with sizes of 21 mm, 23 mm and 25 mm. The chamber was optimized for the calculation of detailed flow profiles by the application of Particle Image Velocimetry (PIV). The measurable flow field covered the complete downstream from the aortic root to the middle of the aortic arch. For the trials the system was calibrated for three modalities with three different stroke volumes (60ml, 70ml, 80ml), heart rates (60bpm, 70bpm; 80bpm) and an adjusted aortic pressure of 120/80 mmHg.
RESULTS: The velocity measurements were performed in 7 Regions Of Interest (ROI). The highest velocities were found in an overview ROI, which covered the whole measuring field. For the 21, 23 and 25mm Trifecta the following values were calculated:
Trifecta 21mm: 2,03 m/s (60ml/60bpm); 2,40 m/s (70ml/70bpm) and 2,53 m/s (80ml/80bpm)
Trifecta 23mm: 1,71 m/s; 1,87 m/s and 2,16 m/s
Trifecta 25mm: 1,44 m/s; 1,74 m/s and 1,93 m/s
Additionally the following parameters were assessed: normal strain in x-direction E xx = ∂V x /∂ x, normal strain in y-direction E yy = ∂ V y /∂ y and the velocity gradients E xy = ∂ V x /∂ y and E yx = ∂ V y /∂ x.
CONCLUSIONS: The results showed that the Trifecta is a very well designed aortic valve that is able to compensate the occurrence of high velocity peaks. As the flow field seemed to be very homogenous and the velocity gradients were small, there were no high velocities close to the aortic walls.

00341

Outcomes of isolated *versus* combined procedures in patients older than 70 years undergoing surgical aortic valve replacement in the era of transcatheter aortic valve replacement

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BACKGROUND: Surgical aortic valve replacement (SAVR) is the gold standard therapy of severe aortic stenosis. Advanced age in addition to concomitant surgical procedures could increase the risk of morbidity and mortality. We therefore aimed to evaluate early and late outcomes of such patients undergoing surgical aortic valve replacement and concomitant surgical procedures in the era of transcatheter aortic valve implantation.
METHODS: A single center retrospective study including 469 patients older than 70 years undergoing SAVR between 01/2007 and 12/2017. Group 1 involved patients undergoing isolated SAVR (N=213) and group 2 involved patients undergoing combined SAVR and concomitant procedure (N=256). Concomitant procedure included aortic root enlargement, ascending aorta reduction or replacement, anterior mitral leaflet decalcification, closure of a patent foramen oval or Cryo-ablation. Primary endpoints involved postoperative morbidities including VARC II criteria, whereas secondary endpoints were freedom of re-aortic valve replacement (AVR) and overall long-term survival.
RESULTS: There were no significant differences between the two groups in regard to age 77±6years *versus* 76±1.5years, P=0.79 and EuroSCORE 12.9±11.8% *versus* 13.5±12.2%, P=0.31. Group 2 exhibited higher 30-day mortality 7% *versus* 2.3% P=0.02. The primary endpoints show no significant differences between both groups regarding cross-clamp times (63±5.7 *versus* 64±27.5minutes, P=0.97), re-exploration for bleeding in (14/6.6% *versus* 17/6.6%, P=0.97), intubation time (10±4.4 *versus* 15±7hours, P=0.39), incidence of myocardial infarction (1/0.5% *versus* 0, P=0.27), stroke (2/0.9% *versus* 1/0.4%, P=0.55), temporary dialysis (14/6.6% *versus* 25/9.8%, P=0.21), respiratory complications (re-intubation 12/5.6% *versus* 13/5.1%, P=0.36 and tracheostomy and gradual weaning (8/3.8% *versus* 13/5.1%, P=0.36), pacemaker implantation in (7/3.2% *versus* 7/2.7%, P=0.99), and ICU-Stay (17.3±3.2 *versus* 23±2.8hours, P=0.14). Both groups have similar incidence of re-AVR due to endocarditis (1/0.5% *versus* 3/1.2%, P=0.57), or prostheses degeneration (4/1.8% *versus* 3/1.2%, P=0.57). Finally, isolates SAVR group was associated with significantly lower 2-year (12/5.6% *versus* 35/13.6%, P=0.004), as well as overall mortality.
CONCLUSIONS: Surgical aortic valve replacement combined with a concomitant procedure in patients older than 70 years was associated with acceptable perioperative morbidity and mortality rates. However, mortality rates were higher when SAVR combined with another procedure. Hence, the indication of concomitant procedure should be carefully chosen.

00321

Modified implantation height of the Sapien 3 transcatheter heart valve

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BACKGROUND: During transcatheter aortic valve implantation, ideal positioning is crucial. The latest generation balloon expandable Sapien 3 transcatheter heart valve comes with a marker, which is recommended to be exactly centered at aortic annular level. The Sapien 3 device has been designed for paravalular sealing incorporating an ex-

ternal sealing cuff. The Sapien 3 transcatheter heart valve received CE-mark approval and was launched in Europe in February 2014. Despite the current company´s recommendations, a higher "aortic" implantation might have an impact on paravlavular leakage and posopterative pacemaker implantation. The aim of the present study was therefore, to evaluate the rate of paravalular leakages and the incidence of postoperative pacemaker implantations at 30-days follow-up with a modified, intentionally higher "aortic" implantation technique.
METHODS: A total of 119 high-risk patients presenting with aortic stenosis were treated with the Sapien 3 transcatheter heart valve. After having placed the transcatheter heart valve more "aortic", clinical and hemodynamic data, especially postoperative pacemaker implantation and paravalvular leakages, were evaluated at 30-days according to VARC-2 criteria.
RESULTS: The Sapien 3 transcatheter heart valve was implanted in 92 patients via the transapical, in 13 patients via the transaortic and in 14 patients via the tranfemoral access. Mean age was 80.6±5.7 years. Aortic valve area increased significantly (0.9 ± 0.3 vs. 1.80 ± 0.35 cm², P < 0.0001) and mean pressure gradients decreased from 41.0 ± 15.0 to 10.4 ± 3.5 mmHg (P < 0.0001). The majority of patients showed no or mild paravalvular aortic regurgitation (99.1 %, 112 / 113), confirmed by transthoracic echocardiography at 30-days: paravalvular leakage was absent or trace in 91.2 % (103 / 113), mild in 7.9 % (9 / 113) and moderate in 0.9 % (1 / 113), whereas no patient developed severe paravalvular leakage. Thirty days mortality was 5.0 % (6 / 119). All patients (n = 113) were in NYHA functional class I or II at 30 days and 3 patients (2.5 %) needed pacemaker implantation.
CONCLUSIONS: In conclusion, a modified higher "aortic" implantation of the Sapien 3 transcatheter heart valve holds promise to further reduce paravalvular leakage as well as permanent pacemaker implantation in transcatheter valve implantation. This trial showed an extremely low postoperative pacemaker implantation rate of 2.5 %.

00112

Mid-term results of transcatheter aortic valve implantation by trans-carotid approach under loco-regional anaesthesia: single center experience

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BACKGROUND: Even if transfemoral represents the optimal access for transcatheter aortic valve implantation (TAVI), a significant number of alternative accesses have been developed in order to treat patients with trans-femoral contra-indication or high vascular risk. Trans-carotid access has been developed as peripheral vascular approach in alternative to trans-thoracic more invasive accesses. Moreover it allows a more direct and easy vascular access comparing to subclavian one. It doesn't need for general anaesthesia. Its major issues are represented by neurological and vascular access-related complications, which should explain its moderate use. In this study, we report our experience and mid-term results in trans-carotid TAVI realized under loco-regional by cervical block.
METHODS: Thirty patients underwent TAVI via carotid artery at our institution, since September 2014 to December 2017. Mean age was 83.6±6,9 years old. the Logistic EuroSCORE was 21,7±12,2, EuroSCORE 2 was 7.7±5,2 and STS Score was 21,1±8,8. The choice for Carotid artery access was achievedby heart team after clinical and CT images screening contraindicating femoral access. The carotid approach was performed through a small low longitudinal cervicotomy after loco-regional anaesthesia by cervical block. The valve Academic Research Consorsium-2 (VARC-2) criteria was used to define the procedural feasibility, device success and post-operative outcomes.
RESULTS: The transcatheter heart valves Edwards SAPIEN 3® (Edwards Lifesciences, Irvine, California) (n= 27; 90%) and the Medtronic Corvalve®/Evolut R (Medtronic, Inc., Mineapolis, Minnesota) (n= 3; 10%) were used. All patients were successfully implanted. Two procedural not-access related deaths were registered (1 annular and 1 myocardial rupture), no vascular access complications. There was one minor stroke (TIA) during hospitalisation. Two patients required a permanent pacemaker implantation after a post-operative third-degree atrioventricular block. Post-operative control echocardiographic showed a satisfactory transvalvular gradients with no paravalvular leak grade 2 or more. Follow-up (mean 12,3 ±9,2 months) was complete. Two late non-cardiac deaths and one major stroke were registered. Functional NYHA class improved dramatically in all alive patients.
CONCLUSIONS: Carotid artery access for TAVI had to be considered as a safe and feasible access. Carotid approach allows a minimally invasive direct access to aortic valve comparing to trans-apical and trans-aortic approaches. Common carotid artery often offers a larger vascular diameter comparing to subclavian one. Moreover carotid approach can be realized under loco-regional anaesthesia with continuous clinical monitoring of neurological status. We believe that carotid approach should be considered as first alternatives in patients with unfavourable femoral access for TAVI.

00361

A new tool for accesses' choices in TAVI using a dedicated software and computer simulation

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BACKGROUND: Transcatheter aortic valve implantation (TAVI) is an alternative to conventionnal surgery in high risk and intermediate risk patients suffering from aortic valve stenosis. In about 20 % of cases the classical percutaneous femoral access is not available and an alternative vascular or non vascular access must be discussed in heart team. Endosize (Therenva, Rennes, France) is a dedicated software to help decision in TAVI. It only requires the native images from CT-scan. Centerlines, left outflow tract, aortic root and tubular aorta are automatically generated. Then, manual key points are determined by user. During heart team discussion accesses are usually debated, we used the sizing and simulation to estimate the accesses possibilities.
METHODS: Thirty consecutive patients requiring a TAVI procedure were compared according to accesses' decision as a feasibility study. First we compared heart team decision and software proposion. Then

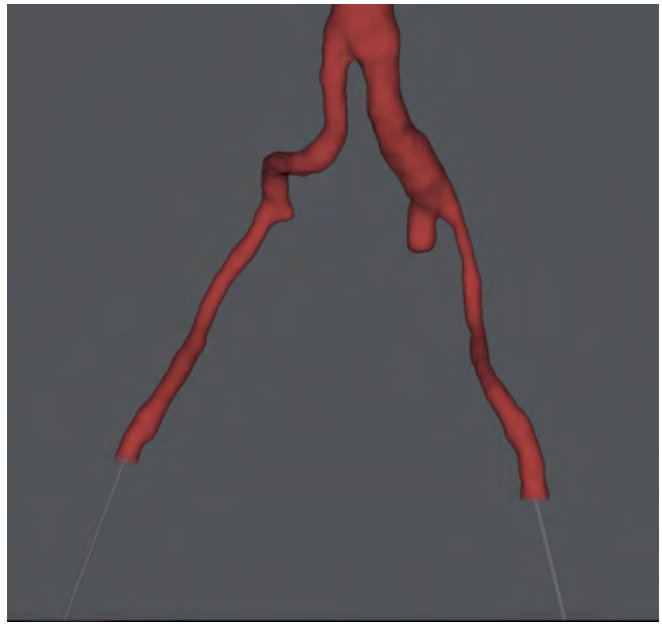

Figure 1.

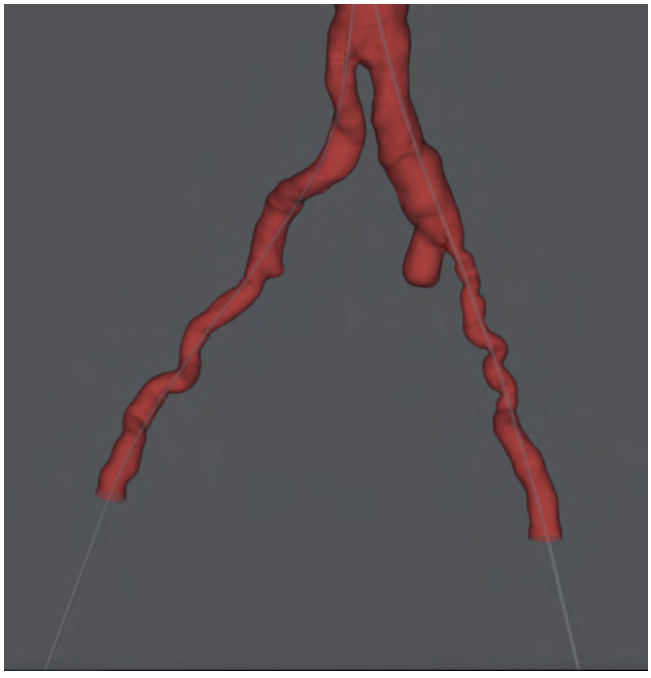

Figure 2.

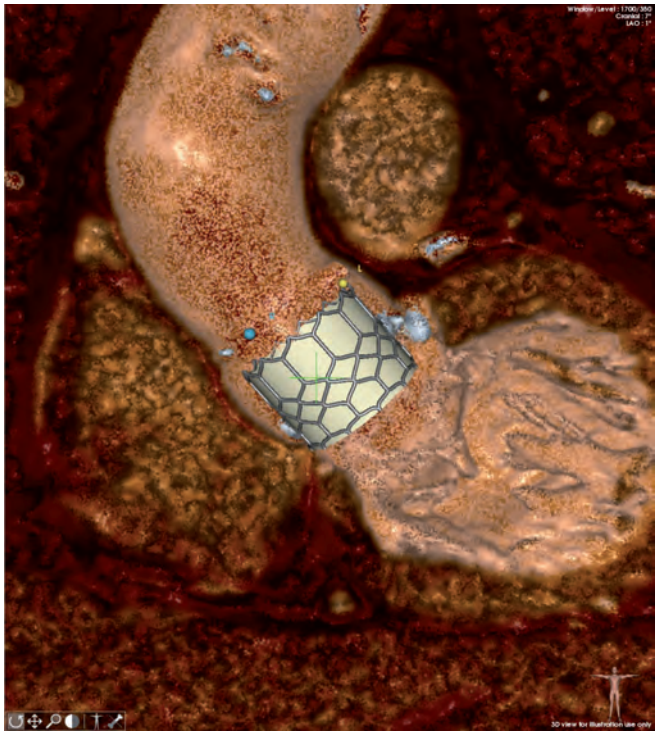

Figure 3.

we simulated the accesses in those 30 patients to determine the vascular deformation and feasibility of vascular TAVI.
RESULTS: In this study 24 TAVI was performed by a femoral access and 6 by a non femoral access, Endosize software gived a 100 % accuracy to choose a femoral or non-femoral procedure. For the 24 femoral patients, all has a technical success of pounction and valve delivery. In the 6 non femoral procedures we performed 5 left carotid TAVI and 1

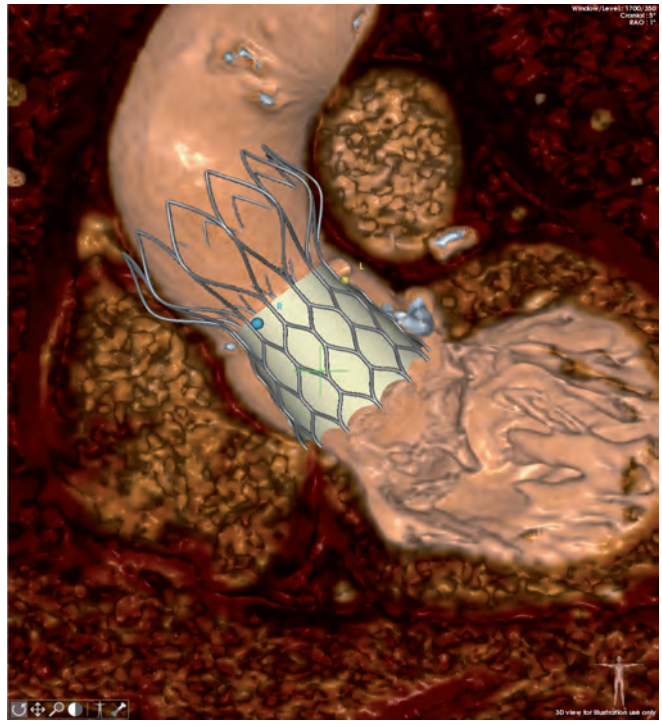

Figure 4.

trans-aortic TAVI. One left carotid patient presented a fail to deliver the valve because of bovine arch. Simulations are still in progress to determine whether they are accurate to determine the real deformations of vascular accesses. Figure 1 shows a non simulated ilio-femoral deformation and figure 2 shows the simulation of vascular deformation due to estimated stiff wire and introducer. Figure 3 and 4 show respectively simulation of Edwards Sapien 3 or Corevalve in the aortic annullus.
CONCLUSIONS: Sizing and helped decision using the Endosize software for TAVI is as reliable as staff decision in to choose between a femoral and non femoral access. For non-femoral accesses, trans carotid and transubclavian artery are the most used. Sizing using an automated, user-friendly, and mobile tool appears to be reproducible. Vascular deformation seems to be accurate to determine if a vascular TAVI is feasible.

00047

Candidate plasma biomarkers for predicting ascending aortic aneurysm in bicuspid aortic valve disease

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BACKGROUND: Bicuspid aortic valve (BAV) disease is the most common congenital cardiac abnormality affecting 1 – 2% of the population, and is associated with a significantly increased risk of ascending aortic aneurysm. An ability to predict which BAV patients will develop ascending aortic aneurysm would allow better individualisation of treatment and help prevent the potentially catastrophic complications of rupture and dissection. However, predicting which patients will develop aneurysms remains a challenge. This study aimed to identify candidate plasma biomarkers for monitoring ascending aortic diameter, and predicting risk of future aneurysm in BAV patients.
METHODS: Plasma samples were collected pre-operatively from BAV patients undergoing aortic valve surgery. Demographic data, including maximum ascending aortic diameter on pre-operative transoesophageal

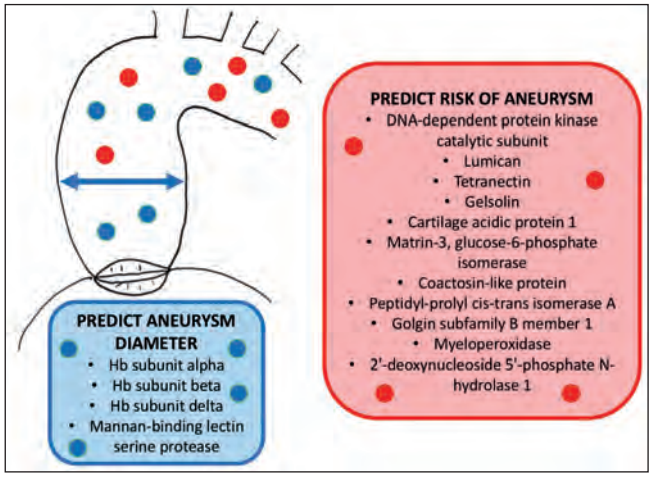

Figure 1.

echocardiography were collected. Maximum diameter ≥45 mm was classified as aneurysmal. Sequential Window Acquisition of all THeoretical Mass Spectra (SWATH-MS), an advanced mass spectrometry technique, was used to identify and quantify all proteins within the samples. Protein abundance and aortic diameter were correlated using logistic regression. Levene's test was used to identify proteins demonstrating low abundance variability in the aneurysmal patients (consistent expression in disease), and high variability in the non-aneurysmal patients (differential expression between 'at risk' and not 'at risk' patients). Statistical analysis was performed using IBM SPPS Statistics package (v24), $p<0.05$ was taken as significant.
RESULTS: Fifteen plasma samples were collected (7 non-aneurysmal and 8 aneurysmal BAV patients). The mean age of the patients was 55.5 years and the majority were female (10/15; 67%). Four proteins (haemoglobin subunits alpha, beta and delta and mannan-binding lectin serine protease) correlated significantly with maximal ascending aortic diameter ($p<0.05$, $r=0.5 – 0.6$). Five plasma proteins demonstrated significantly lower variability in the aneurysmal group, and may indicate increased risk of aneurysm when present in non-aneurysmal patients (DNA-dependent protein kinase catalytic subunit, lumican, tetranectin, gelsolin and cartilage acidic protein 1). A further 7 proteins were identified only in the aneurysmal group and may be associated with risk of aneurysm (matrin-3, glucose-6-phosphate isomerase, coactosin-like protein, peptidyl-prolyl cis-trans isomerase A, golgin subfamily B member 1, myeloperoxidase and 2'-deoxynucleoside 5'-phosphate N-hydrolase 1). A summary diagram of these findings is seen in Figure 1.
CONCLUSIONS: To the best of our knowledge, this study is the first to identify candidate plasma biomarkers for predicting aortic diameter and risk of future aneurysm in BAV patients. It provides valuable pilot data and proof of principle that could be used to design a large-scale prospective investigation of several hundred BAV patients. Plasma levels of candidate biomarkers should be quantified in a large population of BAV patients and matched with changes in ascending aortic diameter from serial follow-up imaging. Ultimately, a more affordable 'off-the-shelf' follow-on blood assay could then be developed in place of SWATH-MS, for use in the healthcare setting.

00318

Our single-center initial experience with the Perceval valve: clinical and hemodynamic data

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BACKGROUND: Sutureless aortic valve replacement (AVR) offers an alternative to standard AVR in aortic stenosis. Sutureless valves have recently become available that allow the surgical procedures to be shortened. This single center observational study aimed to demonstrate safety and effectiveness of a bovine pericardial sutureless aortic valve
METHODS: From June 2014 to February 2018, 56 patients (mean age 75.5 ± 5.1 years; 36 % octogenarian; 67 % female; mean logistic EuroSCORE: 9.2 ± 6.2) underwent sutureless AVR in our Hospital. Concomitant cardiac procedures were performed in 13.5%. There is some experience in minimal invasive Perceval implantation but in our Institution the whole champion underwent via full sternotomy. We implanted 56 Perceval valves during 3.5 years out of 2.000 cardiac operation; representing the 3% of the interventions in our Hospital. There were implanted 6 Small (11 %), 23 Medium (41 %), 19 Large (34 %) and 8 Extra-Large (14 %) valves. This valve is implanted in "special" cases like porcelain aorta, in irradiated and very stiff ascending aorta and aortic valve and in dwarf with extreme thoracic deformations.
RESULTS: In isolated AVR, mean cross-clamp and cardiopulmonary bypass times were 34.8 and 54.9 minutes. Procedural success was 100%. An endocarditis occurred during the 6th postoperative month was treated conservatively. No major paravalvular leak was noticed. No valve thrombosis, migration, or structural valve deterioration occurred during the unstructured follow-up. No stroke occurred in either the early or late period. Permanent pace maker was implanted in 10 patients (18 %). Four of 56 patients (7 %), died during their ICU stay due to multiple organ failure. Mean postoperative effective orifice area was 1.4 ± 0.4 cm2. Mean and peak gradients decreased from 44 and 79 mmHg preoperatively, to 8 and 22 mmHg at the 1st month follow-up. Significant improvement in clinical status was observed postoperatively in the great majority of patients.
CONCLUSIONS: These data support the safety and efficacy of the Perceval sutureless valve in this intermediate to high -risk population with small aortic annulus. It seems according the international bibliography and our experience that Perceval valve implantation is mainly indicated in elderly patients with comorbidities and small aortic annulus. It provides the maximum of effective orifice area with the maximum benefit in hemodynamic of the patient. In our opinion this useful tool is between the classical surgical valve and the trans catheter valve implantation (TAVI) with some important advantages

00138

Occluded carotid axis used for transcatheter aortic valve replacement

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BACKGROUND: Substantive peripheral vascular disease and small-caliber ileofemoral vessels could render transfemoral transcatheter aortic valve replacement (TAVR) challenging or impossible in approximately 20% of patients. Alternative access routes to the aortic valve include transapical, transaortic and subclavian/axillary access. The transapical and transaortic approaches, requiring minithoracotomy or ministernotomy, are more aggressive, making them high-risk procedures. On the other hand, in some patients the subclavian arteries could be severely calcified and tortuose. Transcarotid TAVR under loco-regional anesthesia represents a new and valuable alternative peripheral route for patients without femoral or subclavian access options and poor candidates for thoracotomy. Bilateral patent carotids were described as fundamental prerequisite for transcarotid approach. This report summarizes the case of a successful TAVR via left occluded carotid axis, without other vascular access available for the procedure and wants to emphasize the protective role of the occluded carotid axis.
CASE REPORT: A very frail class NYHA IV 83-year-old man was referred for treatment of severe aortic stenosis. Comorbidities included previous coronary stenting, permanent atrial fibrillation, severe obstructive pulmonary disease and severe peripheral arterial disease concerning in stented right femoral artery, bilateral superficial femoral artery occlusion and anterior tibial artery occlusion. Transfemoral TAVR was excluded. At Angio-CT scan both subclavians arteries and the ascending aorta were widely calcified and not suitable for TAVR access. The right internal carotid artery (ICA) had 50% of stenosis. The

left ICA was chronically occluded with permeability of a more than 7 mm diameter ipsilateral common carotid artery (CCA). The Heart Team concluded that left CCA was the preferred conduit for TAVR in order to avoid thoracotomy and general anesthesia. The procedure was performed under loco-regional anesthesia by cervical block with fluoroscopic guidance. A pigtail catheter through a 6-Fr sheath was introduced in the right radial artery for aortic root angiograms. Temporary ventricular pacemaker was placed into the right ventricle through the right femoral vein. Bilateral cerebral oximetry was continuously monitored. Simultaneously, left CCA was surgically exposed by low cervicotomy, heparin was administrated and a 3-minutes carotid clamping test was realized to evaluate patient's neurological status and oximetry. A 6-Fr sheath was inserted through the left CCA. The aortic stenosis was crossed using a JR4 catheter with a Terumo straight stiff guidewire. The catheter was pushed into the left ventricle and the guidewire exchanged with an Amplatz Super Stiff. The Edwards 21-Fr sheath was inserted through the left CCA and aortic balloon valvuloplasty was performed under rapid ventricular pacing, resulting in a moderate aortic regurgitation. A 29-mm Edwards Sapien3 transcatheter aortic valve was then advanced using Edwards Certitude delivery system across the calcified aortic valve. Under fluoroscopic guidance and after root angiogram to verify optimal positioning, the prosthesis was deployed under 5-seconds rapid pacing at 180/min with excellent seating and no paravalvular leak. Finally, the delivery catheter and the sheath were removed, the left CCA was closed using a 6-0 polypropylene suture and the clamp removed after de-airing. The patient was monitored 12-hours in intensive care unit and transferred to rehabilitation clinic in second post-operative day. Any cerebrovascular or access-related complications occurred. This case suggests that in frail patients with femoral contraindication and associated occluded internal carotid axis, the ipsilateral common transcarotid access could represent a safe approach for TAVR, even in presence of a non-significant contralateral carotid stenosis. Clinical neurological monitoring under loco-regional anesthesia by cervical block represents a key point of this alternative strategy.

00065

Learning curve assessment of trans-catheter aortic valve implantation by Japanese National Registry

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BACKGROUND: Several mandated safety measures were introduced for implementation of trans-catheter aortic valve implantation (TAVI) into Japan, which included proctoring, training program, qualification of physicians and institutions, and the development of mutual TAVI national registry by academic societies in collaboration with Japanese Regulatory Agency and manufacture.
METHODS: To assess the learning curve of physicians performing TAVI, the first 1752 consecutive patients in the registry who were treated between August 2013 and July 2015 were studied. We used case sequence approach to evaluate the association between the incidence of early safety endpoints within 30 days (ESE30) according to VARC2 definitions and the number of past procedure experience (PPE). Patients were divided into 4 groups based on the PPE: Group I, 1st–8th (N=564), Group II, 9th–19th (N=431), Group III, 20th–39th (N=378), Group IV >39th (N=379). Group I was set up because initial 8 cases were supported by the experienced proctors. We used multiple logistic regression analysis to estimate the odds of ESE30 in Group I-III relative to Group IV.

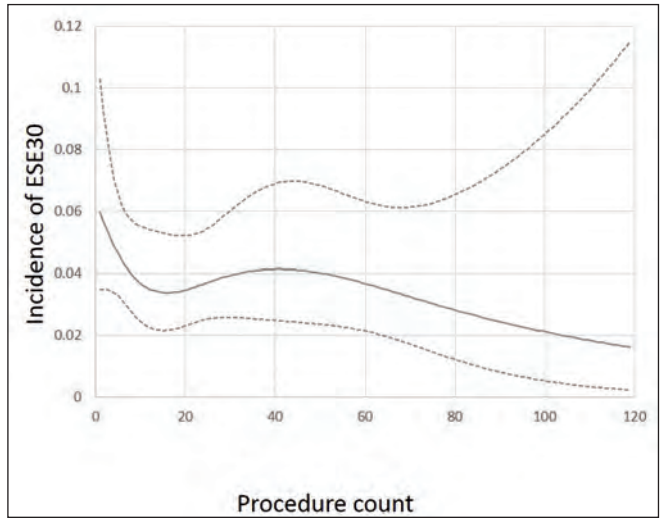

Figure 1.

RESULTS: Thirty-day mortality was 1.4% (N=24). Among the 1752 patients (median 85 year old, male 30.5%), 78 patients (7.9%) experienced 95 ESE30 including death (N=24), stroke (15), life threatening bleeding (7), acute kidney injury (7), coronary artery obstruction requiring intervention (5), major vascular complication (4) and valve related dysfunction requiring repeat procedure (33). Multiple logistic regression analysis showed three predictors for ESE30, NYHA class III/IV (Odds: 1.55, 95% CI [1.03-2.34], P=0.03649), elevated creatinine level (2.74, [1.35-5.56], P=0.0053), and non-transfemoral delivery approach (1.96, [1.24-3.12], P=0.0041). The results didn't show any increased ESE30 incidence in Group I-III compared to Group IV.
CONCLUSIONS: The present real world data failed to demonstrate the initial increased risk of ESE30, which suggested that the risks associated with learning curve process was appropriately mitigated.

00107

Ventilation/Perfusion mismatch is one of the predictor of cardiovascular hospitalization and all-cause mortality in aged Japanese patients after TAVR (Vista study)

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BACKGROUND: Indication of Transcatheter aortic valve implantation (TAVI) is gradually expanding because it is less invasive treatment than surgical aortic valve replacement. Therefore, TAVI is now recommended to aged patients with severe aortic stenosis. However, it is still unknown the predictor of mortality and cardiovascular events after TAVI. In this study, we clarify the predictor of mortality or cardiovascular events in aged Japanese patients after TAVI (Study name; VISTA study: UMIN000019716).
METHODS: Using a prospective observational study, we enrolled consecutive 83 patients in this study from 2015 to 2017 at Gunma Prefectural Cardiovascular Center at Maebashi in Japan. After excluding their severe condition, severe knee problem or refuse the study participants, 68 patients (84±5 y/o, 61% Men) were finally enrolled. All patients were aged Japanese and performed Cardiopulmonary exercise test (CPX) with cycle ergometer after TAVI. CPX was performed using a breath-by-breath method until exhaustion. VE vs VCO2 slope was calculated by a linear regression analysis using the values of VE and VCO2. VE/VCO2 decreases gradually during an incremental exercise until respiratory compensation point (RCP). Then, it shows nadir and after RCP and starts to increase. Minimum VE/VCO2 is defined to be the nadir value of VE/VCO2. We inves-

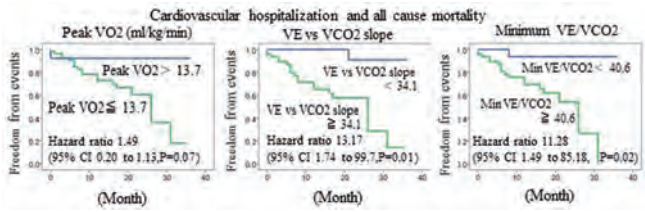

Figure 1.

tigated the correlation between peak VO2, VE vs VCO2 slope and minimum VE/VCO2 parameters, and all-cause mortality and cardiovascular hospitalization events.
RESULTS: Mean observational period was 17±9 months and Euro score II was 4.38±3.91%. During the periods, 5 patients died, and 15 patients hospitalized due to cardiovascular causes (9 heart failure, 1 angina pectoris, 1 arterial fibrillation, 1 cerebral infarction and 3 peripheral artery disease). Peak VO2 was 10.5±3.7 ml/min/kg, VE vs VCO2 slope was 41.6±12.1 and minimum VE/VCO2 was 46.4±7.9.
According to the receiver operating characteristic (ROC) curve, as for the peak VO2 **>13.7 ml/min/kg was adopted as a cut off value. However**, there was no differences in the all cause morality and cardiovascular hospitalization events between the greater group and less group (Hazard ratio 1.49; 95%CI 0.20 to 1.13, P=0.07). On the other hand, cut off point of minimum VE/VCO2 ≥ (Hazard ratio 11.28; 95%CI 1.49 to 85.18, P=0.02) and VE vs VCO2 slope ≥ 34.1 (Hazard ratio 13.17; 95%CI 1.74 to 99.7, P=0.01) showed significant difference in cardiac events and mortality.
CONCLUSIONS: In aged Japanese patients after TAVI, greater minimum VE/VCO2 and VE vs VCO2 slope were associated with greater all-cause mortality and cardiovascular hospitalization event rate. Ventilation/Perfusion mismatch may be one of the most important predicter of cardiovascular events. These results suggest that cardio-pulmonary problem is important for the cardiovascular events after TAVI.

00066

Development of a novel autologous tissue-engineered heart valve for transcatheter implantation

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BACKGROUND: Tissue-engineered heart valves are expected to be viable grafts. However, it is unknown whether they transit their histological structure after implantation. We are developing a novel autologous tissue heart valve (Biovalve) with a unique in-body tissue engineering which is based on a tissue encapsulation phenomenon in the living body. This is expected to be a viable bioprosthesis keeping better biocompatibility. In this study, we developed a stent-valve type for transcatheter implantation and investigated feasibility of the valve and time-course histological transition in a large animal experiments.
METHODS: We created molds for Biovalves using plastic rods easily and quickly with 3D printer, and combined them with 3 kinds of self-expandable metallic stents. We embedded them in the subcutaneous spaces of adult goats for 1-2 months. After harvesting the implant (a mold with a stent and encapsulated tissue) en-bloc and removing the mold only, Biovalve with tri-leaflets similar to those of the native valves were constituted from completely autologous connective tissues and fibroblasts. Twenty-five cases of stent-valve type were implanted into in situ the aortic and pulmonary valves (17 and 8, respectively) with transcatheter technique. In each animal, the stent Biovalve was explanted at 1-month step (from 1 to 6 months) or as long as possible to observe their time-course change.
RESULTS: Biovalves were successfully implanted at both aortic and pulmonary valve position, and showed smooth movement of the leaflets with a little regurgitation in angiogram. The maximum duration of implantation reached to 19 months as a result. The implanted Biovalves were extracted at each duration and examined macroscopically and endoscopically. Calcification were observed in any cases and durations. The tissues showed laminar endothelialization on the surface of the valve leaflets and the cell migration inside the Biovalve body even in 1 month after implantation. The recipients cells have also spread inside the leaflets to the tip gradually in 19 months without any hyperplasia and finally constructed characteristic 3-layered tissues like the native leaflets.
CONCLUSIONS: Implanted Biovalves can adapt their histological structure to the environment even after implantation. This histological adaptation gives us expectation that they can sufficiently exert the functions as the native valves and purposively increase the flexibility and durability for a long while. They have a potential to be used for viable bioprosthetic valves and to keep better function and biocompatibility longer than current ones.

00271

Assessment of the quality of life of patients aged 65 years and above undergoing transcatheter aortic valve implantation (TAVI)

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BACKGROUND: Main aim of this study was to assess the quality of life (QoL) of patients aged 65 and above with symptomatic aortic stenosis (SAS) undergoing TAVI: to compare their QoL at baseline and after procedure; to investigate whether sex, age, body mass index (BMI) and certain co-morbidities had an additional impact on their QoL.
METHODS: Matherial constituted data from National Transcatheter Valve Treatment Registry POL-TAVI. We analyzed data of 333 patients with SAS: 129 men (39%) and 204 women (61%) who underwent TAVI between January 1, 2013 and December 31, 2015. The inclusion criteria were: age ≥ 65 years, 100% completed QoL questionnaire (EQ-5D-3L), filled at baseline, 30 days and 12 months after TAVI. Exclusion criteria included death (within 1-year observation) and alcoholism. QoL was assessed using severity index (SI), calculated by summing 5 digit-individual index (eg. 11111, 12321). Basing on SI values (5-15), we divided study population into 3 groups, corresponding to 3 QoL levels: I - high QoL (5-8), II - moderate (9-12), III - low (13-

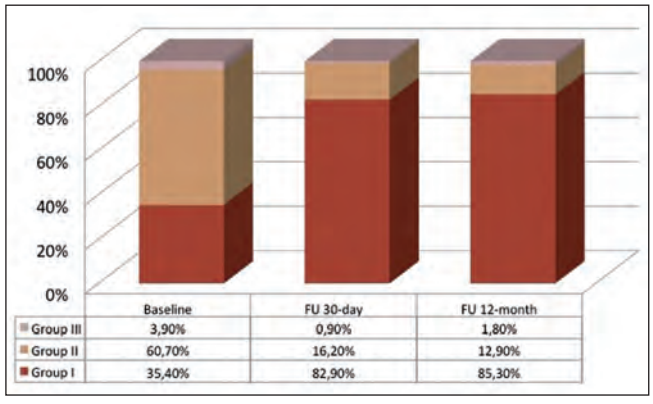

Figure 1.

15). Results at baseline and at 30-day and 12-month follow-up were compared. Moreover, analysis of correlation between QoL and selected parameters, such as sex, age, BMI, chosen co-morbidites [arterial hypertension (AH), diabetes (DM), pulmonary hypertension (PH), atrial fibrillation (AF), chosen neurological disorders (TIA, stroke, dementia)] was performed.
RESULTS: Mean age of study population was 79 years (65-92). Mean BMI was 27.98 (15.1-49.5): 41.1% patients were overweight, 29.4% - obese (2.1% with class III obesity). Analysis of selected co-morbidites revealed that 29.2% patients had 2, 28.2% – 3 and 16.2% - 4 and more conditions. 85.8% patients had AH, 44.1% - DM, 15.9% - PH 13.8% - COPD, 36.6% - AF. Basing on the SI scores at baseline, 35.4% patients were qualified to I group (high QoL). 30 days after TAVI percentage of patients in this group increased to 82.9% and after 12 months - to 85.3%. Before TAVI 3.9% patients were included in III group (low QoL). 30 days after procedure number of patients in this group decreased to 0.9%. 12 months after it was 1.8% (Table 1).
Comparative analysis demonstrated statistically significant improvement of QoL both 30 days and 12 months after TAVI ($p < 0.001$). Improvement was observed more frequently in women ($p = 0.002$). Correlation between age, BMI, chosen co-morbidities and QoL before and after TAVI was no statistically significant (p = ns).
CONCLUSIONS: The study confirmed significant early and long-term improvement of QoL in SAS patients. Correlation between age, BMI, selected co-morbidites and QoL after TAVI was not observed, which may lead to reflection that it was AS that had a dominant impact on perception of QoL before and after TAVI in this group.

00247

TAVI and AV-blockade: do we always need to implant a permanent pacemaker?

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BACKGROUND: TAVI procedure is very widespread in US and Europe, nowadays. But the valve structure of different types predetermines some rhythm and conduction disturbances immediately after implantation.The frequent complication of TAVI is development of complete AV-blockade. So, due to the European guideline recommendations, these patients require a permanent pacemaker implantation. But in our practice in 3 months follow-up period in some patients we observed an almost full recovery of normal AV conduction.
METHODS: In our research we included 386 patients from elderly group with heart failure, valve desease, peripherial atherosclerosis, arterial hypertension who underwent TAVI in 2015-2017 years. Most of the patients were women (70%), mean age of them was 77.2±5 years, mean annulus size 0.7±0.2 cm, mean PG 56.3±12.5 mm Hg, max PG 65-128 mm Hg, mean EF was 52%, EuroScore number was 16±4.3%. CorValve was implanted to 190 of them and Edwards Sapien 3 - to 196. 23 patients developed complete AV-blockade in the first 3 days after the operation. It should be noted that all patients had normal AV conduction before the procedure. Permanent pacemaker was implanted to all of them. We carried out pacemaker follow-up 3 months after implantation.
RESULTS: All of the patients with AV conduction disturbance were from CorValve group. 1 patient died from heart failure progression. In 1 case we explanted pacemaker system because of infection near 3 weeks after valve implantation. It shoud be noted that AV conduction restored in two weeks after implantation of permanent pacemaker.
Results of pacemaker follow-up showed, that 14 from 23 patients (60.8%) recovered normal AV conduction (percent of ventricular pacing less than 1%). Therefore all of them had left bundle branch block.
CONCLUSIONS: In our previous research with first and second generation of Edwards Sapien Valve we had much different results with the need of permanent pacemaker implantation rate of 13.7%. So the third geneneration of Edwards Sapien valve showed perfect results without any conduction disturbance. In such a way, our results make us to think that it can be useful to modify clinical strategy for acute pacemaker implantation after TAVI with CorValve. Maybe the procedure of permanent pacemaker explantation is reasonable option in such cases. Another good option is temporary pacemaker implantation for prolonged period during hospitilization after the TAVI procedure.

00345

Permanent pacemaker implantation after transcatheter aortic valve replacement with and without pre-balloon aortic valvuloplasty

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BACKGROUND: Cardiac conduction disturbances requiring permanent pacemaker (PPM) are common following Transcatheter Aortic Valve Replacement (TAVR). Limited data regarding PPM implantation after balloon-expandable TAVR is available; and there is no data regarding the rate of PPM implantation after TAVR without pre-balloon aortic valvuloplasty.The purpose of this study was to determine rate of PPM implantation after TAVR with or withoutpre-balloon aortic valvuloplasty.
METHODS: From March 2012 to October 2016, 589 patients underwent TAVR at our center. Four hundred and thirteen (70.1%) patients had TAVR with a non-Sapien 3 valve (non-S3 group) and 176 (29.8%) patients underwent TAVR without pre-balloon aortic valvuloplasty with the SAPIEN 3 valve (S3 group). Patients' preoperative characteristics and post-operative electrocardiographs (ECGs) were reviewed.
RESULTS: 589 patients, 328 (55.68%) males and 261 (44.31%) females with mean±SD age of 79.31±8.96 years and mean±SD society of thoracic surgeons' (STS) risk score of 7.55±4.2 were included. Patients in the S3 group had lower STS risk score than patients in non-S3 group, 6.83±3.72 *versus* 8.03±4.43 (p=0.002). Transfemoral approach was more commonly used in S3 group *versus* non-S3 group (98.86% *versus* 72.74%, p<0.001). Twenty-four (13.63%) patients in S3 group and 74 (17.91%) patients in non-S3 group had preoperative PPM (p=0.22). From 491 patients with no prior PPM, 61 (12.42%) patients required new PPM implantation. There was no difference in PPM implantation rates between S3 and non-S3 groups, 15 (8.52%) *versus* 46 (11.13%) (p=0.37). Male patients required more PPM implantation than female patients, 12.5% (41/328) *versus* 7.66% (20/261) (p=0.05). No other association between patients' preoperative characteristics and PPM implantation was identified. The majority of patients (n=35, 57.37%) requiring PPM implantation had it within 3 days of TAVR. New left bundle branch block (LBBB) occurred more commonly among S3 patients than non-S3 patients, 9 (5.11%) *versus* 4 (0.96%), (p=0.004). PPM implantation was not recognized as a risk of in-hospital mortality, 6.55% (4/61) *versus* 4.54% (24/528), (p=0.51).
CONCLUSIONS: PPM implantation rates are acceptable after TAVR. Patients who undergo TAVR with S3 and non-S3 valves are at similar risk of post TAVR PPM. In this series the S3 group had a higher risk of new LBBB development; and in these patients continuous ECG monitoring early after TAVR is advised.

00406

A retrospective one-year, single-center analysis of transcarotid Transcatheter Aortic Valve Implantation results

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BACKGROUND: Transfemoral access is the most commonly employed approach to perform Transcatheter Aortic Valve Implantation (TAVI). In 20% of cases, this option is unsuitable and alternative direct vascular routes are needed. When transfemoral approach is impossible, transapical access is the most employed. But due to important complications, other pathways are being tested. We report a series of 22 pa-

tients undergoing successful TAVI procedures through common carotid artery (CCA).
METHODS: During a one-year period, we performed in our center 22 transcarotid TAVI under general anesthesia in patients contraindicated for iliofemoral approach.
The mean age was 81,7±5,7 years. The mean EuroSCORE was 25,9±11,4%, respectively. Delivery sheath were inserted 17 times (77,3%) into left and 5 times (22,7%) into right CCA. Edwards Sapiens 3 valve was implanted in 16 procedures (72,7%). Medtronic Corevalve Evolut-R valve was used in 6 procedures (27,3%).
RESULTS: All the procedures were successful. There were no procedural access-related or TAVI-related complication. No major bleeding was noticed. There were 2 vascular complications (9%) : 1 patient (4,5%) required a CCA patch angioplasty and 1 (4,5%) had hematoma. Pacemaker implatation was required in 5 patients (22,7%) because of third-degree atrioventricular block. Two transient ischemic attack (TIA) (9%) and 1 major cerebellar stroke (4,5%) occured. Thirty-day survival was 95,5%.
CONCLUSIONS: CCA access to perform TAVI is a perfectly reliable alternative to transfemoral approach with no reckless risk-taking.

SESSION: VASCULAR ABSTRACT SESSION V: EVAR

TIME: 08:00-09:30

ROOM 2: ALSACE

00252

Tailoring of ch-EVAR to various anatomic challenges with the currently available endografts is feasible and effective treatment

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Department of Vascular Surgery, Faculty of Medicine, School of Health Sciences, University of Thessaly, Larissa, Greece

BACKGROUND: Juxtarenal abdominal aortic aneurysms are challenging for endovascular repair. Chimney technique (ch-EVAR) is an alternative of treatment and gains popularity in patients with severe comorbidities, estimated as high risk for open aortic aneurysm repair. The aim of this study is to report our initial single center experience and results with the use of chimney technique for juxtarenal abdominal aortic aneurysm (AAA) treatment by using the currently available endografts.
METHODS: All patients treated with ch-EVAR between May 2016 and December 2017 were retrospectively reviewed. All patients had proximal landing zones precluding any standard endovascular intervention and were thought to be at high risk for open aortic aneurysm surgery. Follow-up surveillance protocol included computed tomography angiography before discharge (3rd post-operative day), at 1 month, 1 year and yearly thereafter. Demographics, comorbidities and aortic abdominal computed tomography angiographies were analyzed.
RESULTS: Eighteen patients (17 males; 1 female; median age 71.1±6.4 years) underwent chimney procedures for 31 renal and 4 superior mesenteric arteries. Ten patients received an Endurant graft, while a Nellix endovascular device was used in eight patients. The median preoperative proximal neck length was estimated at 3mm (range, 1-8 mm), while the median new neck length using the chimney technique changed to 21.5 mm (range, 18-38 mm). All target vessels received a balloon expandable stent graft, while in 6 vessels relining with a self-expandable stent was achieved. Primary technical success was 100%. Thirty day mortality was 16.6% (3/18), while one patient suffered an ischaemic, converted to hemorrhagic, stroke the 5th post-operative day. During a median follow-up period of 12 months (range, 1-19 months) freedom from target vessel occlusion was 93.3%. There were two target vessel restenosis (1 renal artery stent and 1 superior mesenteric artery stent). The superior mesenteric artery stenosis was treated successfully by endovascular means the 6th postoperative month. One type III endoleak was successfully treated with the use of an iliac bridging stent-graft. Freedom from chimney graft-related reinterventions at 3 months was 92.3%.
CONCLUSIONS: Juxtarenal aneurysms are a challenging aortic pathology for the vascular surgeon. The chimney technique for juxtarenal abdominal aortic aneurysm endovascular repair by using the currently available endografts allows tailoring to each patient specific anatomy and it seems a feasible and safe option, at least in the short-term, in patients at high risk for open repair. Despite the minimal invasive nature of the procedure, these patients remain fragile during the period and need a meticulous perioperative and postoperative care.

00395

Endovascular treatment of infrarenal aneurysms: comparison of the results of EVAR with use of different endoprosthesis

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BACKGROUND: Endovascular aneurysm repair (EVAR) has cardinally changed the treatment of abdominal aortic aneurysms (AAAs), but specific problems such as device migration, continued sac increasing from endoleak, and graft limb thrombosis culminate in a high rate of secondary procedures and failure to protect against aneurysm rupture. Stent graft evolution is often addressed as a cause for improved outcomes of endovascular aneurysm repair for patients with an abdominal aortic aneurysm. The aim of this study was to evaluate the late results of EVAR with the endografts currently in use and compare outcomes to older devices.
METHODS: Two hundred fifty-five patients treated by EVAR between 2010 and 2017 were included in this retrospective study. All patients were divided into two groups. Demographic, anatomical, perioperative and follow-up data were collected in a prospective way in an electronic database and compared between two groups. Group 1 (n=120) represented the patients treated by 2nd generation stentgrafts (Cook Medical Zenith Flex, Gore Excluder, Medtronic Talent, Vascutek Anaconda, Lombard Aorfix, Lifetech Ancura, JOTEC E-vita) and group 2 (n=132) represented the patients treated with 3rd generation stentgrafts (OVATION PRIME Endologix, Incraft Cordis, Medtronic Endurant I &II, Cook Medical Zenith LP). Results were assessed with the Kaplan-Meier method for censored data.
RESULTS: The mean follow-up was 48,6 ± 29,3 months. The patients of group 2 had significantly more risk factors and cardiovascular comorbidities (coronary disease, tobacco addiction, dyslipidemia, peripheral arterial disease, chronic renal insufficiency). The estimated freedom from secondary interventions at 30 days, 1 year, 3 years, was 95.2%, 88.4%, 78.2% for group 1 and 98.8%, 89.2%, 79.3% for group 2. Anatomical characteristics were similar in the two groups, but the iliac arteries which were significantly more calcified and had a smaller diameter in group 2. The rate of perioperative complications was similar in the two groups, in particular for complications related to the approach. During the follow-up there was no significant difference between the two groups in the rates of survival, reinterventions, or recent endoleaks and the progression of the aneurysmal sac.
CONCLUSIONS: Newer-generation endografts can perform substantially better than the older devices This study shows that current generation stentgrafts allow to achieve results comparable with those of the early generation stentgrafts in the setting of more complex anatomy of more complex iliac anatomies. These results make it possible to expand the indications of EVAR to patients presenting more cardiovascular comorbidities without increasing the risk of complications in the short and medium term.

00254

Factors associated with elimination of Endoleak type II during 12-month period post-EVAR

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BACKGROUND: Endoleak type II (ET II) is the most common complication after endovascular aortic aneurysm repair (EVAR), with an incidence ranging from 11% to 22%. Natural history of Endoleak type II (ET II) after endovascular abdominal aortic aneurysm repair (EVAR) and its associated factors are still debatable. The aim of this study is to examine the progress of ET II during the post-operative 12 months period and to identify the factors that may be associated with its elimination.
METHODS: A total of 881 patients who underwent EVAR between 2006 and 2017 were entered into a prospective database. Patients with ET II at 1st month computed tomography angiography (CTA) were categorized in two groups: group 1; elimination of ET II at 12 months CTA vs. group 2; persistence of ET II at 12 months CTA. All patients were analyzed in terms of pre-operative demographics, co-morbidities, intra-operative details and CTA at 12 months. Patients that developed ET II after the first year were excluded from the study.
RESULTS: A total of 140 (16%) patients (mean age of 71.7±8.5 years old; 93.5% male: 131/140) were eligible for the study. Almost all patients were asymptomatic (92%; 129/140). Group 1 included 58 patients (41%) and group 2, 82 patients (59%). The mean aortic aneurysm diameter at the time of operation was 60±11mm, with 44% (61/140) receiving a supra-renal fixation endograft. More than half of the patients received at least an extra limb extension (62%; 87/140). An internal iliac occlusion (IIA) intra-operatively was undertaken in 20 patients (14.3%). At 12 months CTA, the mean sac regression was higher in group 1 (decreased in 31, stable in 15, increased in 6 and unspecified in 6 cases) than in group 2 (decreased in 19, stable in 26, increased in 2 and unspecified in 8 cases); group 1, -3±4 mm vs. group 2, 0.55±3 mm, P=0.000. During 12 month follow up period, four access related re-interventions were undertaken, while 3 deaths occurred (2%; 3/140). The multivariate analysis showed that elimination of ET II was associated positively with statin therapy (OR 2.6; 95% CI: 1.01- 6.8, p=0.047) and sac regression (OR 1.24; 95% CI: 1.11-1.39, p=0.000) and negatively with intra-operative internal iliac occlusion (OR 0.232; 95% CI: 0.06-0.86, p=0.03).
CONCLUSIONS: The use of statins may instigate ET II elimination during first post-operative year. Sac diameter is more likely to regress in patients with ET II elimination during the same period. IIA occlusion during EVAR may amplify the persistence of ET II.

00388

Evar hostile anatomies. Solutions within stentgrafts IFU's: short necks, extreme angulations, small aortic diameter, calcium and thrombus

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BACKGROUND: Aortic neck management is one of the key elements for successful outcome after endovascular repair of infrarenal aortic aneurysms (EVAR). A challenging neck remains the primary cause of anatomical exclusion for EVAR. Most of the stent-graft IFUs exclude these cases due to the high risk of type 1 endoleaks. The main issues are: short necks (< 1cm), extreme angulations (>60-90º), small aortic diameters (< 16 mm) and the presence of thrombus and/or calcium in the juxtarenal area.

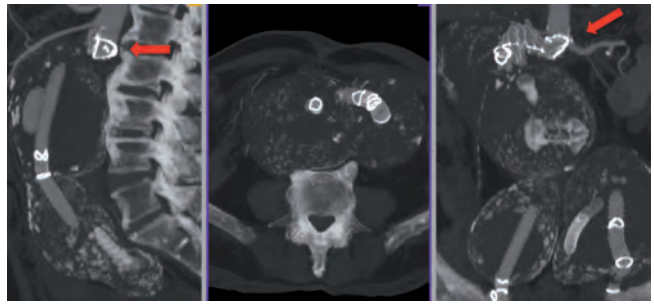

Figure 1.

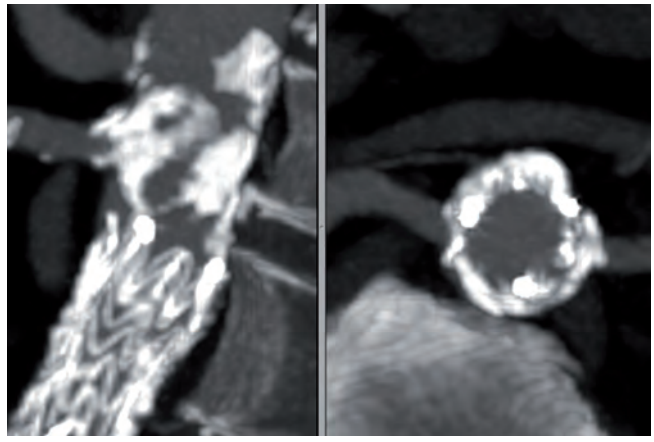

Figure 2.

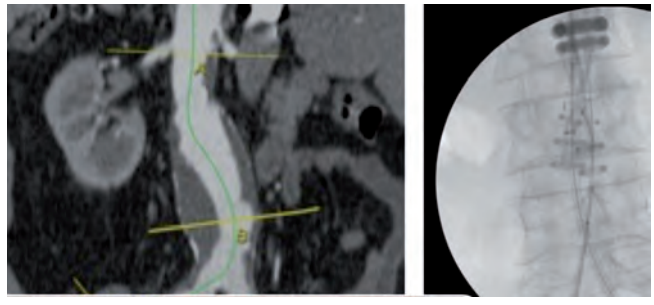

Figure 3.

CASE REPORT:
CASE 1: EXTREME ANGULATION: 86 y.o. man, 8.4 cm AAA, severe proximal angulation(>100º) and giants iliacs aneurysms. P-EVAR with an Aorfix stentgraft (LOMBARD) and sandwich technique with a covered stent-graft (Viabahn) to preserve left hypogastric flow. Follow-up:2 years. (Fig 1)
CASE 2: CALCIUM: 80 y.o. man, 6 cm AAA, circumferential calcification of the juxtarrenal neck (>70%) and tortuous and complex iliac access successfully treated with an Excluder stent-graft (GORE WL). Follow-up:3 years. (Fig 2)
CASE 3: THROMBUS: 82 y.o man, 6.2 cm AAA, thrombus in the juxtarrenal aorta. P-EVAR with an Ovation stent-graft (TRIVASCULAR) to minimize the risk of distal embolization. Follow-up: 2 years. (Fig 3)
CASE 4: SHORT NECK: 82 y.o man, 6.6 cm AAA with thrombus and infrarrenal neck (<0.5 cm) treated with a custom sized Zenith-fenestrated graft (COOK) and ADVANTA (ATRIUM) covered stent-grafts in the SMA and both renal arteries. Follow-up:7 months. (Fig 4)
CASE 5: SMALL AORTIC DIAMETER: 77 y.o man, 5.5 cm AAA with a small diameter in the infrarrenal aorta (< 15 cm) and a 3 cm left

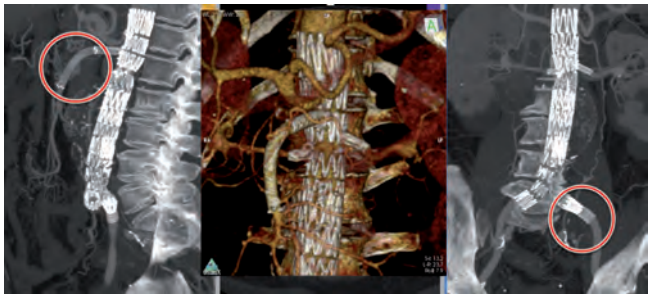

Figure 4.

iliac aneurysm fixed with the combination of a TAG stentgraft (GORE WL) for the proximal sealing, an Excluder (GORE WL) bifurcated stentgraft and an iliac branch graft (GORE WL) for the lerft iliac aneurysm exclusión. Follow-up:3 years.
No complications or endoleaks during the follow-up. One patient death 7 months after the procedure due to a pneumonia (unrelated to the procedure). Hostile proximal neck morphology remains an independent cause for initial failure and endograft-related adverse events in the long-term. By careful selection of different systems of fixation, sealing and deployment of endografts, we have the opportunity to solve some different neck issues with today's available technology within their IFU´s. Over the coming years, new generations of stent-grafts will likely address more complex neck issues within their IFUs. Clinical criteria but not anatomical consideration will be the likely limit for EVAR treatment.

00182

Successful endovascular treatment for EVAR limb occlusion as a first line treatment option

H. Szekessy [1], M. Hofmann [1], D. Jaeger [1], P. Buntschu [1], D. Pakeliani [1], R. Kopp [1], F.J. Veith [1, 2, 3], T. Pfammatter [4], G. Puippe [4], M. Lachat [1], Z. Rancic [1]

[1]Clinic for Cardiovascular Surgery, University Hospital Zurich, Zurich, Switzerland; [2]Department of Vascular Surgery, The Cleveland Clinic, Cleveland, OH, USA; [3]NYU Langone Division of Vascular and Endovascular Surgery, New York University Medical Center New York, New York, NY, USA; [4]Department of Interventional Radiology, University Hospital Zurich, Zurich, Switzerland

BACKGROUND: The goal of this study was to analyze our experience considering the frequency, the clinical presentation and the endovascular treatment modalities of patients with EVAR related limb occlusion in a single center setting.
METHODS: We reviewed the patients that underwent endovascular treatment for EVAR related limb occlusion after EVAR between July 1997 and December 2012. In that timeframe, 25 patients were included (mean age: 70-year-old, 88% male). Besides analyzing clinical data, as well as details regarding the EVAR, the devices and EVAR related limb occlusion (time to EVAR related limb occlusion, presumed cause, interventional details and technical success, primary and secondary patency rate, perioperative mortality, and conversion to open repair).
RESULTS: Of all the patients, 2.27% (25/110) presented with limb occlusion after EVAR with a mean time interval between EVAR and EVAR related limb occlusion of 416 (range: 10-1486; SD: 405.99) days. The most common cause (9/25, 36%) of the EVAR related limb occlusion was a combination of trunk migration, crown disintegration and limb dislodgements. This type of constellation of complications occurred only in Vanguard® (Boston Scientific, Natick, MA, USA) endoprostheses (9 cases of 110 grafts, 8.1%). In the following endoprostheses of the later generation, the main reason of occlusion was thrombosis due to stenosis (12 out of 1000 EVARS, 1.2%). The percutaneous treatment consisted of a local thrombolysis in the affected EVAR limb. In 14 out of 25 cases (56%), stents were also implanted to correct the underlying cause of the occlusion. The technical and clinical success rate was 100% with a primary patency rate of 90.0% after one month, and 83.33% at 6, 12, 24, 48 and 60 months. The secondary patency rate was 100%.
CONCLUSIONS: The complication of EVAR related limb occlusion can be treated successfully by endovascular means. In most cases, local thrombolysis with subsequent correction of the cause by stenting is sufficient. Although EVAR related limb occlusion occurred more frequently in first-generation endoprostheses, yet this complication did also occur in current endoprostheses.

SESSION: VASCULAR ABSTRACT SESSION VI: ABDOMINAL AORTIC ANEURYSM

TIME: 08:00-09:30

ROOM 4: COLMAR

00399

Comparison and validation of a DIGG risk prediction model with established risk prediction models of in-hospital mortality after elective abdominal aortic aneurysm repair

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BACKGROUND: There are several different risk prediction models for elective abdominal aortic aneurysm (AAA) repair. Most of them base on regression analysis and include the open (OR) or endovascular (EVAR) repair as an item of the analysis, which results in a bias of the correlation coefficients of all other items. This study bases on DIGG AAA registry 2013-2016 and develops a risk prediction model, which uses an individual regression analysis for OR and EVAR.
METHODS: DIGG registry Data (2013-2016) were collected and set up to a database using SPSS 22. Risk factors and comorbidities with significant correlation were identified for EVAR and OR using data from 2013 to 2015 (n=10494). Individual regression models were created for EVAR and OR. For calibration of these regression models Hosmer-Lemeshow test and a Bootstrap analysis were performed. Both regression models were merged to a hybrid model. Data from 2016 (n=3831) were used for Validation with ROC analysis. The model was compared to Glasgow Aneurysm Score (GAS) and Vascular Study Group od New England using ROC analysis.
RESULTS: The overall mortality in the population was 2,3% (1,3% for EVAR, 5,4% for OR). 8 items were chosen for regression analysis to describe EVAR. For OR 7 items were chosen. For both therapies 7 risk groups were created (EVAR 0,19% - 44,44%; OR 2,41% - 45,45%). With AUC 0,817 the discriminating ability of the DIGG model was high. The internal validation confirmed this ability with AUC 0,810. There was a significant benefit using DIGG model *versus* VSGNE (AUC 0,753) and GAS (AUC 0,663).
CONCLUSIONS: The DIGG risk prediction model has the best discriminating ability for mortality in this patient population. The excellent result of internal validation shows the possibility of applicability for future DIGG registry data. The model can reliably detect high risk patients for EVAR and OR.

00301

Surgical treatment approaches for ruptured abdominal aortic aneurysm

S. Masuyama, T. Inoue, T. Ichihara

Ohtakanomori Hospital, Kashiwa, Japan

BACKGROUND: In recent years, endovascular aneurysm repair (EVAR) which is performed as a surgical treatment for abdominal aortic aneurysm (AAA) has accounted for half of the total EVAR. In the so-called era of EVAR, open surgery has occupied an important role due to the necessity to respond quickly to ruptured AAA and the possibility of acute compartment syndrome caused by the remaining hema-

toma; however, because improved success rate for lifesaving surgery has not yet been shown in patients with ruptured AAA, it is necessary to establish surgical approaches suitable for each type of AAA, including challenging juxtarenal. Here, we discuss effective surgical approaches based on our experiences.
METHODS: Of 103 patients who had undergone surgery for AAA (including juxtarenal) between December 2014 and November 2017, 27 undergoing emergent operation for ruptured AAA were investigated. Basically, aortic-clamping above the celiac trunk (CT) was performed below the diaphragm through a median approach with an incision which was made from just below the xyphoid process to above the umbilical region. Then, after a wide laparotomy, infrarenal aortic-clamping was performed via a retroperitoneal approach. However, in the case of juxtarenal AAA extending into the renal arteries, a lateral approach was first prioritized, and if necessary, aortic-clamping above the CT was performed with cardiopulmonary bypass. The distal aortic-clamp was then placed on the location available. In potential cases of severe adhesion, prosthesis implantation through a lateral approach under hypothermic circulatory arrest was also considered. We made it our policy to directly perform infrarenal aortic-clamping not only when aortic rupture occurred peripherally, but also when aortic neck length was long enough.
RESULTS: Among 27 patients with ruptured AAA (mean age: 56.0 ± 9.5 years, male: 20, female: 7), 19 underwent aortic-clamping above the CT through a median approach (including 2 who directly underwent infrarenal aortic-clamping due to difficulty with the CT identification), 2 directly underwent infrarenal aortic-clamping, 5 with juxtarenal AAA underwent aortic-clamping above the CT through the left lateral approach, and 1 with confirmed ruptured pseudo-aneurysm at the anastomosis site underwent redo surgery under mild hypothermic circulatory arrest. The times required from the patient entering the operating room to surgery start time were 13.2 ± 4.4 minutes in median approach and 31.2 ± 11.2 minutes in lateral approach for juxtarenal AAA, and the times required from surgery start time to the first aortic-clamping above the CT were 4.8 ± 1.5 minutes in median approach and 24.3 ± 13.9 minutes in lateral approach for juxtarenal AAA. The time required from the first aortic-clamping to infrarenal aortic-clamping in median approach was 8.7 ± 4.8 minutes. Five patients who had died perioperatively were in shock before surgery.
CONCLUSIONS: In all approaches, lifesaving principles included how quickly to aortic-clamp while avoiding further bleeding and how to prevent organ ischemia due to aortic-clamping, which appears to be largely involved in the prognosis of ruptured AAA.

00215

When to refuse the treatment of patients with ruptured AAA

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Vascular Surgery Department, University Hospital and Faculty of Medicine in Pilsen, Pilsen, Czech Republic

BACKGROUND: Despite a progress in the intensive care, patients with treated rupture of AAA still have high 30 days mortality rate, that did not change notably during last decades. Patients are older and polymorbid. The treatment is expensive, but in some patients ineffective. Prediction of outcome of patient with ruptured aneurysm could help to change the decision about the treatment. The final decision about the treatment means ethical dilemma. Should we begin to treat everybody? Whom should we refuse the treatment from the beginning? How long should we still continue with the treatment in case of organ failure?
METHODS: Retrospective analysis of preoperative, perioperative and postoperative data of patients with ruptured subrenal aneurysm, that were treated with open approach technique. Single center experiences. Study included all 198 patients operated in the period of 1999 - 2015. Comparison of the patient´s outcome (30 days mortality) and the predictive ability of Hardman index or Glasgow aneurysm score. Statistical analysis of obtained data with the aim to look for a novel predictive factor or development of own scoring scale.
RESULTS: We performed surgery in 198 patients. Majority of patients were men 76%. The mean age was 75 years (55 – 92). 30 days mortality was 37,2%. 2days mortality rate was 31,3% and one year mortality rate 53%. The diameter of aneurysms differed from 3,2 to 12 cm (mean 7,3cm). There was a positive correlation between two organ system failure and mortality (p<0,001). Other data were not with significant correlation. Patients with time delay from the beginning of symptoms to final surgical treatment had worse prognosis. The prognosis of patients with manifestation in mean of haemorhagic shock was inferior as well, but the correlation was not significant (p=0,08). Hardman index failed to predict the death in our cohort (p=0,213) as well as the Glasgow aneurysm score (p=0,092).
CONCLUSIONS: Regarding our results and published data we still don´t have effective tool for prediction of outcome of patients with treated rupture of an aneurysm. Many factors and variables have impact on the treatment. Almost one half of patient with ruptured AAA, that received surgical treatment survived 1 year after surgery. Our policy did not changed – refuse the treatment in patients with end stage disease or end stage tumor only.

00173

Role of retroperitoneal approach to AAA in the current endovascular era

G. Maritati [1], A. Oliva [1], M. Ruggiero [1], A. Dabbicco [1], C. Ferrer [2], P. Boggia [1], G. Sbenaglia [1]

[1]Vascular and Endovascular Unit, Ospedale 'Antonio Perrino'-ASL BR, Brindisi, Italy; [2]Department of Surgery 'Pietro Valdoni', Sapienza University of Rome, Rome, Italy

BACKGROUND: To assess the value and importance of open surgical approach: retroperitoneal (RP) and transperitoneal (TP), in treatment of abdominal aortic aneurysms (AAA) in the current endovascular era.
METHODS: AAA characteristics included presence of rupture, involvement of aortic branches, and the need for intraoperative supra-renal aortic clamp. Primary outcomes comprise 30-days and in-hospital mortality, and early post-operative complications (myocardial infarction -MI, paralytic ileus, pneumonia, acute kidney injury). The secondary outcomes were death or complications during the 24-month period.
RESULTS: During the period from October 2015 to November 2017, in total we treated 64 AAA: 48 AAA underwent endovascular treatment (EVAR) and the remaining 16 open surgical repairs: 9 with the RP and 7 with the TP approach. In the TP group there were more ruptures AAA (3/7 vs 0/9), more involvement of aortic branches (3/7 vs 0/9), and less need for supra-renal aortic control (3/7 vs 9/9). During supra-aortic clamping, renal cold crystalloid perfusion was used in most cases (2/3 in the TP group vs 6/9 in the RP group). The TP group recorded one death at 30 days (MI after ruptured AAA repair) and

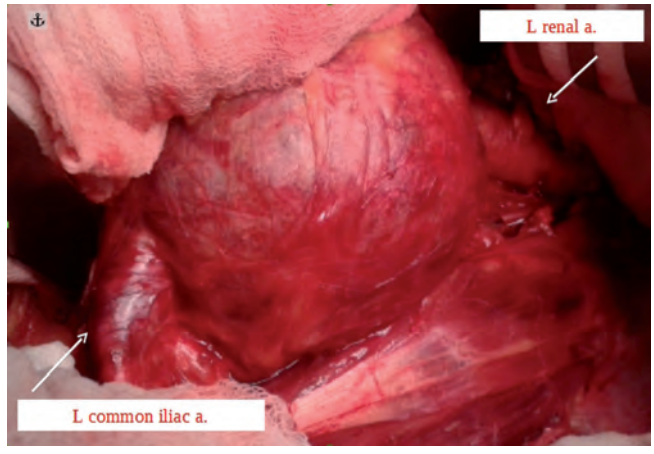

Figure 1.

one paralytic ileus; the RP group included one intra-hospital death (stroke). Three patients with chronic kidney disease showed a temporary further deterioration in renal function, which was fully recovered at discharge. During the follow-up period, neither death nor major complications were recorded.
CONCLUSIONS: Widespread use of EVAR in the management of AAA results in fewer open repairs.In dedicated aortic centres, where both open and endovascular treatments are provided at all levels of complexity, AAA open repairs often require a more extensive control of the supra-renal aorta. On the contrary, in centres where complete endovascular treatment of complex aortic aneurysms is either impossible or unfeasible, open surgery is more commonly necessary. There are two possible solutions. One is to refer patients to centres that can treat AAA by complete endovascular means. Alternatively, open surgery may be performed in centres with open surgical skills when safer and more extensive control of the supra-renal aorta through the RP approach is needed. In our experience, and in accordance with the best evidence available, the RP approach to the abdominal aorta may became more relevant than in the past. Centralization and open surgery programmes should provide training for vascular surgeons to be familiar with the RP approach.

00002

Outcomes of surgical explantation of infected aortic grafts after endovascular and open abdominal aneurysm repair

J. Schaefers, K. Donas, G. Panuccio, G. Torsello, M. Usai
University Hospital, Muenster, Germany

BACKGROUND: Endovascular aortic repair has gained the role of gold standard in the treatment of aortic pathologies and it is related to lower mobiditie and mortality rates. Open repair is nowadays performed in by younger patients or patients with acceptable operative and anesthesiologic risks. However Infection of the vascular graft represents one of the most threatening complications after aortic repair. A comparison of outcomes after explantation of infected conventional or endovascular grafts has not yet been published. Aim of this study was to present short-term outcomes after surgical treatment of infected aortic grafts after endovascular and open repair of abdominal aortic aneurysms (AAAs).
METHODS: We retrospectively reviewed data of all patients affected by aortic graft infection (AGI) who underwent an explantation of an infected conventional or endovascular aortic graft between January 2008 and December 2016. Only patients who underwent a open or endovascular repair for infrarenal aortic aneurysmas were included. Clinical, morphological and microbiological characteristics were collected. All patients underwent in situ reconstruction using a rifampicin soaked allograft. Primary endpoint of this study was 30-day mortality; secondary endpoints were major postoperative complications. Differences between the groups in continuous variables were analyzed using Mann-Whitney U test and analysis of variance test. Differences between the groups of noncontinuous variables were analyzed using the $\chi 2$ test or the Fisher exact test. Time-dependent variables were analyzed using Kaplan-Meier life tables and survival analyses performed using log-rank test. For all comparative tests and analysis, a value of $P < .05$ was considered significant.
RESULTS: Twenty-six patients were included in this cohort, 16 with an infected endograft (iEVAR) and 10 patients with an infected conventional graft (iOAR), 30-day mortality was 23.1% overall, 37.5% for iEVAR and 0% ($P = .027$) for infected OAR. Postoperative major complications occurred in 8 (50%) patients of the iEVAR group and in 4(40%) patients of the iOAR group. Supravisceral clamping rate was higher in patients with infected iEVAR (93.8 vs 20%, $P = .001$), furthermore a greater incidence of postoperative acute kidney injury was observed (50 vs 0%, $P = .009$).
CONCLUSIONS: Explantation of the graft and in-situ reconstruction for aortic graft infection is accepted as the therapy of choice. However, re-operation for iEVAR is related to significant higher mortality and morbidity rates. The need for suprarenal aortic clamping seems to be a possible explanation for worse outcomes in iEVAR. Moreover, suprarenal cross clamping is related to higher incidence of postoperative acuke kidney function deterioration.

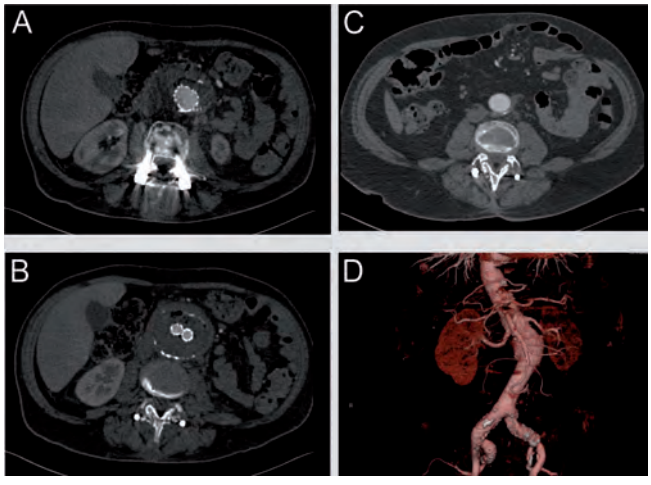

Figure 1.

00190

Open and endovascular repair of iliac artery aneurysms: 10-year clinical experiences

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[1]Department of Vascular Surgery, Heart and Vascular Center, Semmelweis University, Budapest, Hungary; [2]Department of Cardiology, Heart and Vascular Center, Semmelweis University, Budapest, Hungary

BACKGROUND: Iliac artery aneurysm (IAA) is a rare vascular disease and it makes up 2% of all aneurysms. IAAs coexist with abdominal aortic aneurysm in 20% of all cases. Surgery of iliac aneurysm consists of open repair or endovascular intervention. There are few data available on the results of surgical treatment, therefore the optimal treatment is unclear. Timing and operative technique of properly selected surgical treatment determines the outcome. Our objective was to analyze the perioperative morbidity and mortality of patients who underwent iliac artery surgery. We also compared the results of elective open surgery and endovascular iliac aneurysm repair (EVIAR).
METHODS: Retrospective analysis of patients who underwent surgery for iliac artery aneurysm in a tertiary care university center between 1 January 2005 and 31 December 2014.
RESULTS: During the 10-year period, 62 patients with a mean age of 68.9 years underwent elective surgery for iliac artery aneurysm (54 males, 87.1%). In 10 cases acute surgery was performed due to aneurysm ruptures (13.9%), 3 patients died within the perioperative period (30%). Regarding anatomical localisation, aneurysm developed mostly on the common iliac artery (80.6%). As an elective surgery, 35 patients (56.5%) underwent open surgery, 25 (40.3%) underwent EVIAR and other endovascular interventions were performed in 2 cases (3.2%). Postoperative complications [1 patient (4.0%) vs. 17 patients (48.5%); $p<0.001$] and intensive care (IC) treatment [29 patients (82.8%) vs. 2 patients (8.0%); $p<0.001$] were significantly rarer after EVIAR than after open surgery. Furthermore, EVIAR resulted in considerably shorter postoperative hospital stay (4.7±2.3 days vs. 11.8±12.2 days; $p=0.006$) and significantly less blood transfusion [1 patient (4.0%) vs. 26 patients (74.2%); $p<0.001$]. There were no significant differences regarding long-term survival rates between EVIAR and open surgery (81.4% vs. 71.4%; $p=0.95$).
CONCLUSIONS: Patients who underwent iliac aneurysm repair were characterized by male predominance. This vascular disease appears mainly in the 7th decade particularly on the common iliac artery. Following EVIAR, there were significantly less postoperative complications. Less patents required IC observation and the length of stay at IC unit and the number of postoperative days spent in the hospital were

reduced. EVIAR is recommended primarily for the surgical treatment of iliac artery aneurysms based on the experienced lower complication rates and shorter postoperative length of stay.

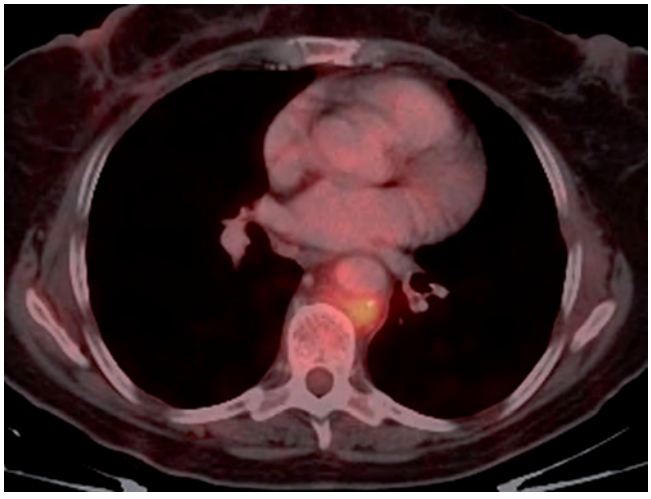
00032

PET-CT as an indicator for antibiotic treatment duration following endovascular repair for mycotic aneurysms

J. Weissmann [1], A. Shnaker [1], S. Mahajna [1], Y. Griton [2], S. Fajer [1]

[1]Vascular Surgery Unit, Meir Medical Center, Kfar Saba, Israel; [2]Interventional Radiology Unit, Meir Medical Center, Kfar Saba, Israel

BACKGROUND: Mycotic aortic aneurysm (MAA) is a rare vascular condition, with a high risk of fatal complications. In the past, the customary treatment was aggressive debridement and open arterial repair. However, in recent years the endovascular option has become more common. We describe a case of a patient, who was diagnosed with a mycotic aneurysm and underwent successful endovascular repair, along with extended postoperative antibiotic treatment.
The antibiotic time frame was determined by a close follow-up of positron emission tomography-computed tomography (PET - CT) scans until resolution of the infection.
CASE REPORT: A 76-year-old female was admitted with fever of unknown origin (FUO) lasting several weeks. She was a heavy smoker and her medical background included osteoporosis and Rheumatoid Arthritis with chronic methotrexate treatment. Several days following her admission, she reported mid back pain between the scapulae and an epigastric discomfort. An extensive workup was conducted and included: Chest and abdomen CT, Trans Esophageal Echo and repeated blood culture. None of these modalities shed a light on the etiology of her high fever. A PET - CT was then performed and was compared to the previous CTs. The PET CT demonstrated a mycotic thoracic aortic aneurysm (MTAA) of 4 cm with a ruptured aortic plaque located in the posterior wall of the descending thoracic aorta (D8-9). We decided to treat the MTAA via an endovascular approach after two days of wide spectrum antibiotic administration, eliminating fever and any systemic signs of infection, for we were concerned of impending rupture of this symptomatic mycotic aneurysm. The endovascular repair of the descending thoracic aortic aneurysm included the successful deployment of a Captiva Graft. The female patient had no postsurgical complications. Perioperative cultures were found to be positive for Haemophilus Influenza and the antibiotic regimen was administered accordingly with intravenous ceftriaxone. She was monitored closely by recurrent PET - CT scans, which demonstrated no FDG uptake in the aorta and a gradual diminution of infection. Once there was no evidence of any persisting infection, the antibiotic therapy was stopped with a total treatment duration of 6 months. Follow up 6 months after the cessation of the antibiotic treatment was uneventful.



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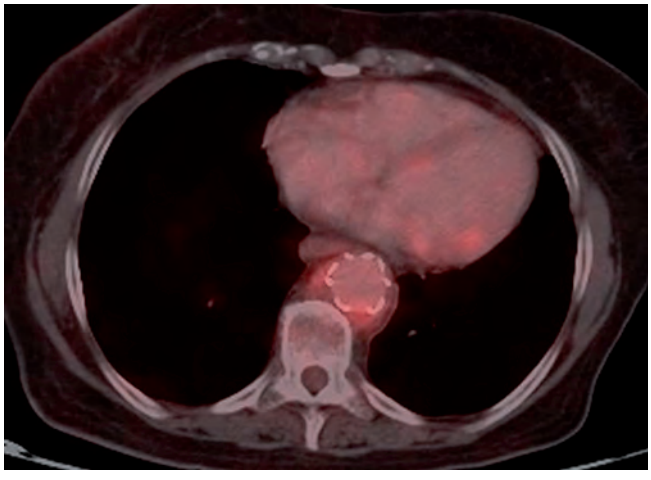

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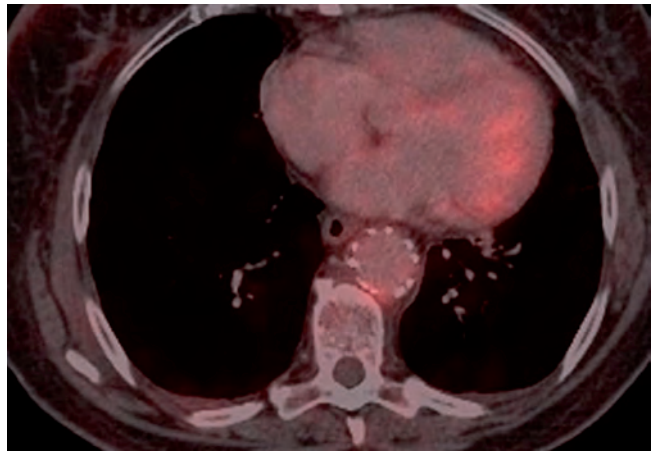

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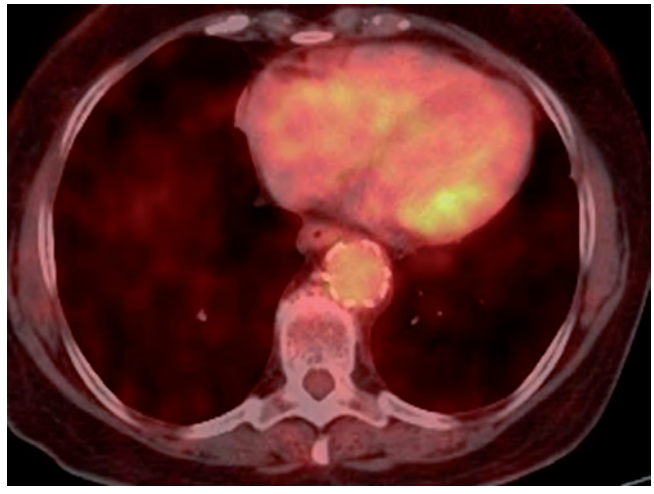

Figure 4.

SESSION: CARDIAC ABSTRACT SESSION VII: ATRIAL FIBRILLATION & INDICATION AND TECHNIQUES OF LAA OCCLUSION

TIME: 11:15-12:30

ROOM 1: FRANCE

00082

Single-knot lock procedure for adjustment of the length of artificial chordae in mitral valve repair

Y. Shimamura, K. Maisawa

The Department of Cardiovascular Surgery, Saitama City Hospital, Saitama, Japan

BACKGROUND: Implantation of artificial chordae has become a widely accepted procedure for mitral valve repair. Adjustment of the neochordae to the correct length, implantation in sufficient number, and replacement in the proper position are the keys for successful reconstruction of artificial chordae. Various techniques have been introduced for this repair, but a standard technique that meets all of these key requirements has not been identified. We describe a simple and reproducible technique to solve these issues of artificial chordae reconstruction with a single-knot lock procedure and our initial experience with this technique.
METHODS: A needle with CV4 e-polytetrafluoroethylene suture is looped around hemostatic forceps. The needles are tied over the tip of the forceps, passed through a small pledget, and an anchor loop of 4 mm in length is created. The needles are passed through the respective papillary muscle and tied over a second pledget, which fixes the anchor loop on the papillary muscle. A needle with CV5 suture is passed through the anchor loop, and both ends of the suture are passed through the free edge of the prolapsed mitral leaflet. Several sets of the CV5 sutures are placed if the prolapse is extensive. A single knot is made on the leaflet with the two ends of each suture thread, and the ends of each pair of suture threads are secured with small hemostatic clamps. The hemostatic clamps are suspended over the edge of the wound or the retractor to apply traction to the single knot. The knot is locked with this tension and the friction between the threads. The left ventricle is then distended with cold saline, and areas of prolapse and failure of coaptation are identified. The height of the artificial chordae is adjusted by sliding the knot to the appropriate position. After valve competency is obtained, the knot is held by curved hemostatic forceps, and the threads of the suture are tied on the leaflet.
RESULTS: We applied this technique in 5 patients (2 men, 3 women, mean age: 72 years). The technique was used successfully in all patients without switching to prosthetic valve replacement or causing in-hospital death. Postoperative echocardiography showed no or only trivial mitral regurgitation in 4 patients and mild regurgitation in 1.
CONCLUSIONS: Artificial chordae construction with this novel single-knot lock procedure is quick, reliable, reproducible, and increases the technical possibilities for mitral valve repair.

00118

Pulmonary artery denervation as a new method of non-farmacological treatment of residual pulmonary hypertension after pulmonary endarterectomy

A. Chernyavskiy [1], N. Novikova [1], B. Rudenko [2], A. Edemskiy [1], A. Romanov [1]

[1]Novosibirsk, Russian Federation; [2]Moscow, Russian Federation

BACKGROUND: The true incidence of chronic thromboembolic pulmonary hypertension (CTEPH) is still remains unknown. This disease is poorly progressing and has a bad prognosis without appropriate treatment. Pulmonary endarterectomy (PEA) is the first treatment of choice in patients with CTEPH. Residual pulmonary hypertension (RPH) occurs after PEA in 5-35% of cases. According to our center experience the frequency of RPH is 18%. For a long time, the only method of treatment of RPH remained onle medical drugs. Such patients were shown lifelong reception of specific drugs. The method of choice for such patients now can be an intervention strategy in the treatment of minimally invasive low-traumatic endovascular interventions - methods that have evolved in recent years, including radiofrequency ablation of the pulmonary artery. We assessed the safety and efficiency of pulmonary artery denervation (PAD) for treatment of RPH after pulmonary endarterectomy (PEA).
METHODS: A pilot prospective observational multicenter trail was performed between 2015 and 2017. 26 patients with RPH after PEA underwent PAD. The mean age of the patients was 39 (26; 51) years. The median delay between PEA and PAD was 4.5 years (1;8). RPH criteria were mean pulmonary artery pressure of more than 25 mm Hg. PAD was performed with the usual electrophysiological catheter and a non-fluorography 3D navigation system. Denervation was performed by radiofrequent ablation of the nerve plexus and ganglia located in pulmonary bifurcation area. All patients before procedure and after 12-month follow up underwent the following examinations: echocardiography, perfusion and ventilation lung scintigraphy, pulmonary angiography, right heart catheterization with strain gauges, 6-minute walking distance test.
RESULTS: There were no cases of mortality and other adverse events during the PAD procedure and follow up. The medium operation time was 105 (93;120) minutes. In 12 months after PAD a significant decrease in the rate of mean pulmonary artery pressure from 38 (29;42) mm Hg to 26 (22;35) mm Hg ($p<0,01$), pulmonary vascular resistance from 600 (387;667) dyn×sec×sm-5 to 351 (156;450) dyn×sec×sm-5 ($p<0,01$) and increase in the 6MWT from 372 meters to 455 meters ($p<0,001$) were observed. All patients subjectively noted decrease in dyspnea and increased tolerance to exertion.
CONCLUSIONS: Keeping increased perioperative risk and mortality in mind, significant pressure reduction and improved functional outcome is usual after pulmonary endarterectomy in the majority of these patients with quite low rate of residual pulmonary hypertension. However, in 5-35% of cases RPH occurs. The leading role in the formation of these mechanisms of pulmonary hypertension is the activation of the sympathetic nervous system. Anatomically, in the area of the bifurcation of the pulmonary trunk and the begining of the pulmonary arteries there is a large number of baroreceptors. Influence on the area of location of these vegetative ganglia by radiofrequency ablation leads to a decrease in the activity of sympathetic influence, and as a result, to a decrease in the level of pressure in the pulmonary artery and pulmonary vascular resistance. Our pilot study has shown safety and the efficacy of PAD in patients with RPH after PEA as during procedure and as after 12-month follow up. However, for confirmation of these results a multicenter randomized study is required.

00402

Primary hydatid cyst of the thoracic aorta revealed by peripheral arterial embolism: a case report and review of the literature

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BACKGROUND: Hydatidosis is a parasitic disease caused by the development in humans of the larval form of the Taenia Echinococcus Granulosus, Echinococcus Multilocularis, or Echinococcus Vogeli. In Tunisia, only Echinococcus Granulosus is present.
CASE REPORT: We report the case of a 55-year-old woman with no previous medical history, was admitted to our department with reported progressive-worsening pain in her left lower limb since one week. Clinical and para-clinical explorations have concluded the presence of primitive hydatid cyst of the thoracic aorta with intra-aortic rupture, occlusion of the external left artery and another splenic hydatid localization. Patient underwent surgery through thoraco-phreno-lombotomy under right femoro-femoral bypass. A second lateral thoracotomy at the 5th intercostal space was needed to control the proximal portion of the aorta. A complete resection of

the destroyed portion of the aorta was performed, and aortic continuity was restored by aorto-aortic bypass graft with a Dacron prosthesis. The surgical procedure was completed with a splenectomy. The postoperative follow-up was uncomplicated. The patient was extubated 24 hours after surgery, with good respiratory and hemodynamic parameters. The thoracic and peritoneal drains were removed on the fifth postoperative day. A CT angiography showed a patent aortic bypass; with good arterial permeability in the both lower limbs. The aortic wall represents an exceptional localization for a primitive hydatid cyst. Although a benign parasitic pathology, this can be responsible for serious arterial, systemic or multi-visceral complications. Surgical treatment is required to remove the cysts entirely, and prosthetic replacement should be considered a first-line option, whenever possible.

00050

10-year outcomes after pulmonary endarterectomy

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BACKGROUND: The true incidence of chronic thromboembolic pulmonary hypertension (CTEPH) is still remains unknown. This disease is steadily progressing and has a poor prognosis without appropriate treatment. Pulmonary endarterectomy (PEA) is the first treatment of choice in patients with (CTEPH). PEA has 1C level of evidence and class of recommendations according to pulmonary hypertension guidelines. The best results of surgical treatment achieved in expert pulmonary hypertension centers with high surgical activity (approximately 20 PEA's annually or more). We present 10-year outcomes of surgical treatment in patients with CTEPH.
METHODS: Between 2004 and 2017 282 patients underwent PEA for CTEPH. 10-year outcomes after surgery were assessed in 179 (63.5%) patients. These patients underwent clinical (6 minute walk distance (6MWD), Borg dyspnea scale, SF-36 questionnaire) and instrumental evaluation (transthoracic echocardiography, VQ pulmonary scintigraphy, right heart catheterization). Computed tomography and pulmonary angiography used for the level of lesion assessment.
RESULTS: Mean patient age at surgery was 48.5 [40.5;57.25] years. 6MWD increased from 200 [197;202] m before surgery to 453 [440;460] m in long-term follow-up, ($p<0.001$). Borg scale index decreased from 7 [6;8] to 1 [1;2], ($p<0.001$). There was a significant reduction in mean pulmonary pressure from 37 [32;40] to 29 [28;31] mmHg ($p<0.001$) and pulmonary vascular resistance from 830 [621.2; 1380] to 510 [482; 682] dyn·sec·cm-5 ($p=0.021$) in long-term follow-up. Residual pulmonary hypertension in long-term follow-up was registered in 51 (18%) patients. We also noticed significant elevation of cardiac output from 3.68 [2.8;4.1] to 4 [3.2;4.4] l/min in the whole group ($p<0.001$). According to VQ pulmonary scintigraphy we noticed statistically significant reduction of lung perfusion deficit from 43.4% [37.85; 41.9] to 10.8% [10.9; 12.3], ($p<0.001$). Overall mortality was in 23 (8.3%) cases. There were 15 in-hospital deaths (5.3%) due to reperfusion pulmonary edema (n=8), multiorgan failure (n=3) and pulmonary bleeding (n=4). In 10-years follow-up period mortality was registered in 7 (2.4%) cases due to residual pulmonary hypertension and progressive right hear failure.
CONCLUSIONS: Despite the quite increased perioperative risk and mortality, PEA should be considered in patients with CTEPH as the method of choice. Complete preoperative operability assessment by experienced multidisciplinary team is mandatory. The following methods are usually sufficient in operability assessment: standard clinical evaluation, transthoracic echocardiography, VQ pulmonary scintigraphy, right heart catheterization, computed tomography and pulmonary angiography. Keeping increased perioperative risk and mortality in mind, significant pressure reduction and improved functional outcome can be achieved in the majority of these patients with quite low rate of residual pulmonary hypertension.

00401

Surgical management of cardio-pericardial hydatid disease: a Tunisian center experience

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BACKGROUND: Cardiac hydatid disease is a rare, but it is potentially a life-threatening pathology. It has fatal complications such as valvular dysfunction, free wall rupture, embolism, anaphylactic reactions, conduction disturbances, or congestive heart failure. We report our experience in the management of such lesions.
METHODS: We report 12 cases of cardio-pericardial hydatid disease that underwent operation in our institution between January 2000 and December 2016, and we review our results. The mean age was 31.83 years and it ranges of 11 to 65 years. Male to female ratio was 1. The diagnosis of hydatid disease was confirmed by transthoracic echocardiography in all patients. The cyst was located in the left ventricular free wall in 5 cases, the right ventricular free wall in 1 case, the interventricular septum in 3 cases, the interatrial septum in 2 cases, and the pericardium in 1 case. Three patients had multiple organ hydatidosis: in the interatrial septum and the two lungs in one case; in the left ventricle, the left lung, the liver, and the peritoneum in 1 case; and in the left ventricle, the left lung, the liver and the breasts in 1 case. All of our patients underwent surgery. The patients with cardiac cysts were operated under sternotomy and standard cardiopulmonary bypass with antegradecardioplegia and aortic cross-clamping. The patient with pericardial hydatidosis was operated under posterolateral thoracotomy and without cardiopulmonary bypass.
RESULTS: The postoperative period was uneventful in all our patients. We didn't have any cardiac hydatidosis recurrence in the follow-up of our patients. Only one patient was operated two years after cardiac surgery for recurrence of pulmonary cysts.
CONCLUSIONS: Surgery should be recommended in all cases of cardiopericardial hydatid disease in order to avoid their complications.

SESSION: CARDIAC ABSTRACT SESSION VIII: CARDIAC ANESTHESIA

TIME: 11:00-12:30

ROOM 3: STRASBOURG

00365

Low *versus* standard-blood-flow reperfusion strategy in experimental ischemic refractory cardiac arrest treated with Extra Corporeal Life Support

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BACKGROUND: This study was designed to assess the effect of two Extracorporeal Life Support (ECLS) blood-flow strategy in an experimental model of E-CPR on macrocirculatory and microcirculatory parameters, lactate clearance and cytokine storm in the first six hours of resuscitation.
METHODS: Cardiac arrest was induced in 18 pigs by surgical ligature of the left coronary artery. ECLS was initiated after one minute no-flow and 40 minutes low-flow. The ECLS blood flow was set on 30~35 $ml.kg^{-1}.min^{-1}$ *versus* 65-70 $ml.kg^{-1}.min^{-1}$ according to the randomized group. Continuous systemic blood pressure and carotid blood flow were continuously monitored. Blood gas analysis and lactate were measured

at the baseline, H0, H3 and H6. Sublingual microcirculatory was assessed by Sidestream Dark Field (SDF) technology and the following parameters were assessed: total and perfused vessels density (TVD, PVD), the proportion of perfused vessels (PPV) and microvascular flow index (MFI). Leg tissue oxygenation (StiO2□was monitored by a Near-Infrared Spectrometer (NIRS) device. Cytokine inflammatory was measured with a multicomplexed sandwich ELISA-based quantitative array platform.
RESULTS: There was no difference between groups at baseline and at ECLS initiation (H0). Lactate and sublingual microvascular parameters were significantly impaired after the low-flow period. MAP target (65mmHg) was reached in each randomized group. Total infused norepinephrine (1422[908-2254] µg.kg^{-1} vs 711[93-1325] µg.kg^{-1}, p=0.063) and total infused fluid (7600[4150-19000] ml vs 9000[3100-20750] ml, p=1.000) were similar between the two groups. A significant difference was observed in the six hours evolution concerning carotid blood flow (low-blood-flow group vs standard-blood-flow group at H6: 19[5-34.45] % vs. 60.78[43.7-82] %, p=0.004). Lactate clearance at H6 was inferior in the low-blood-flow group compared to the standard-blood-flow group (6.67[-10.43-18.78] vs. 47.41[19.54-70.69] %, p=0.04). Concerning the microvascular parameters, the low-blood-flow group had lower PVD (9.72[4.35-11.02] vs.12.05 [10.94-14.51] mm/mm2, p=0.006), PPV (70.55[36.07-78.92] vs. 86.12[78.9-88.51] %, p=0.008) and MFI (1.63[0.97, 2.35] vs. 2.44[2.22, 2.69], p=0.031) at H3 compared with the standard-blood-flow group but no significant difference observed at H6. No significant difference was found about the level of the cytokines pro-inflammatory and anti-inflammatory between the two groups at the end of the experiment.
CONCLUSIONS: In conclusion, in an experimental porcine model of refractory cardiac arrest treated by ECLS, application of a low-blood-flow target (30-35 ml.kg^{-1}.min^{-1}) during the first six hours post ECLS implantation does not appear to be associated with any favourable effect on haemodynamic or microcirculatory parameters

00297

Atrial fibrillation following coronary artery bypass graft: identify the real problem and clinical impact

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BACKGROUND: The real clinical impact of atrial fibrillation (AF) in postoperative outcome following coronary artery bypass graft (CABG) surgery is still a controversial issue. Recently published metanalysis, focused on the incidence of postoperative complications in patients experiencing postoperative AF, failing, however, to completely differentiate the role of AF as primary event causing a complication from its role as a consequence of a complicated postoperative course. In such scenario AF should be considered a secondary complication and therefore a marker more then a cause of unfavourable outcome. In this study we sought to elucidate the real clinical impact in terms of modified postoperative course of transient AF occurring in patients, previously in sinus rhythm (SR) undergoing CABG surgery.
METHODS: All patients undergoing isolated CABG surgery during the last two years period at our Division were enrolled in this study. History of previous paroxysmal AF was not considered as exclusion criteria, providing that the patient was in SR at hospital admission. Incidence of postoperative AF was evaluated and defined as following: a) Transient postoperative episode of AF (TPOAF) was considered as an episode of reversible postoperative AF which was successfully converted to SR (either with pharmacological treatment either with DC cardioversion) before patients discharge to the rehabilitation clinic; b) Persistent postoperative AF (PPOAF) was considered as an irreversible episode of postoperative AF, insensitive to the treatment (either pharmacological either DC Cardioversion) which failed to be converted before patient discharge. Both TPOAF and PPOAF were then correlated to the incidence of postoperative unfavourable events such as death, mayor complications (stroke, cardiac failure requiring IABP or left ventricle assistance device, surgical reexploration, prolonged mechanical ventilation) and minor complications (prolonged hospital stay, inotropic support, anaemia requiring blood transfusion). Finally the recurrence of AF in patients discharged in SR was investigated at 1-year follow-up.
RESULTS: One hundred- seventy-five overall patients (mean age 67+/-11 yo; male gender 84%, body mass index 26+/-3) were enrolled in the study. Ten pts (6%) presented history of preoperative paroxysmal AF. All patients survived the operation and were discharged to rehabilitation clinic. Three patients (1,7%) experienced PPOAF and were therefore discharged with rate-controlled AF (none of them had history of paroxysmal AF). Thirty-nine patients (22%) presented TPOAF, which was successfully treated (with pharmacological +/- DC cardioversion treatment) before patient discharge (5 of them had a previous history of paroxysmal AF). Mechanical Ventilation time (p=0,8), ICU stay (p=0,1) and total hospital stay (p=0,5), in patients with TPOAF, were all not significantly different from patients who remained in stable sinus rhythm trough all postoperative course. Furthermore TPOAF was not risk factor for any of the complications considered (inotropic support, infections, bleeding and blood transfusion). At 1-year follow up 2 pts (5%) presented recurrence of AF, which turned in persistent AF in 1 patient.
CONCLUSIONS: In patients in SR undergoing satisfactory isolated CABG surgery, transient postoperative AF, despite being a frequent event, usually does not impact significantly postoperative outcome. In such patients, furthermore, the incidence of recurrence of AF, even without a maintenance therapy is quite low.

00128

Influence of chronic hypoxemia and high concentration of hemoglobin on the development of complications in the early postoperative period in patients with cyanotic congenital heart diseases

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BACKGROUND: This study aimed to identify the impact of chronic hypoxemia and initial concentration of hemoglobin on development of organ dysfunction in the early postoperative period in patients with congenital heart diseases underwent surgery with cardiopulmonary bypass, to study their effect on the dynamics of serum lactate and the parameters of the hemostasis system in the early postoperative period.
METHODS: The study included 93 patients (operations for right ventricular outflow tract obstruction - 58 patients, Fontan procedure- 26 patients and bidirectional Glenn procedure- 9 patients). The patients were divided into two groups with a complicated and uncomplicated course of the early postoperative period. ROC analysis was used to study the effect of chronic hypoxemia and initial hemoglobin concentration on the development of early postoperative complications. There was studied the presence of a correlation between the partial pressure of arterial oxygen, hemoglobin concentration before surgery and serum lactate concentration, hemostasis.
RESULTS: In the groups statistically significant differences were found: in terms of initial hypoxemia with 100% oxygen inhalation 123 ± 94 mmHg (with complications) and 230 ± 158 mmHg (without complications), p=0,01, when comparing the levels of serum lactate in the postbypass period, 3.2 ± 1.5 mmol/l (with complications) and 2.2 ± 0.8 mmol/l (without complications), p = 0.002, the maximum lactate concentrations 7,4 ± 3,7 mmol/l (with complications) and 5,4 ± 3,4 mmol/l (without complications) and INR values at admission to the intensive care unit 2,1 ± 2,9 (with complications) and 1,4 ± 0.2 (without complications), p = 0.04. There was no difference in hemoglobin concentrations. When analyzing the dependence of the development of organ dysfunctions in the early postoperative period on the values of the partial pressure of arterial blood oxygen before surgery, it is revealed that hypoxemia may be a predictor of complications, AUC = 0.687, cut-off

value 203 mmHg. When analyzing the dependence of the development of complications on the concentration of hemoglobin, the unsatisfactory quality of the model is revealed. A correlation was found between the value of the arterial blood oxygen partial pressure and the number of platelets after the end of perfusion (correlation coefficient 0.33, p = 0.004), postbypass INR (correlation coefficient -0.43, p = 0.004), postbypass fibrinogen (correlation coefficient 0.3, p = 0.05), fibrinogen after admission to the intensive care unit (correlation coefficient 0.36, p <0.001). It was found a statistically significant correlation between initial concentration of hemoglobin and the maximum serum lactate concentration (correlation coefficient 0.37, p <0.001), as well as with hemostasis: number of platelets after the end of perfusion (correlation coefficient -0.31, p = 0.006) , postbypass INR (correlation coefficient 0.4, p = 0.007), postbypass fibrinogen (correlation coefficient -0.42, p = 0.005), fibrinogen after admission to the intensive care unit (correlation coefficient -0.36, p = 0.001).
CONCLUSIONS: Chronic hypoxemia plays a leading role in the development of early postoperative complications. The initial hypoxemia is associated with coagulopathy, but not the concentration of serum lactate. A high level of hemoglobin in patients with cyanosis is associated with increased serum lactate and coagulopathy, but not with the risk of early postoperative complications.

00137

Impact of bleeding complications on length of stay and critical care utilization in cardiac surgery in England

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BACKGROUND: Bleeding is a common complication in cardiac surgery and is associated with substantial morbidity and mortality. Using the linked Clinical Practice Research Datalink (CPRD)/Hospital Episode Statistics (HES) databases, this study evaluated the impact of bleeding complications on hospital length of stay (LOS) and critical care utilization among patients undergoing cardiac surgery in England.
METHODS: Retrospective, observational cohort study using linked hospital (HES) and pre-admission primary care records (CPRD) for patients aged ≥ 18 years who underwent coronary artery bypass graft (CABG), valve repair/replacement, aortic operations, or heart transplant in 2010Q1-2016Q1. Surgical bleeding complications were measured from date of surgery through discharge, defined as diagnosis of haemorrhage/haematoma complicating a procedure and/or reoperation for bleeding; reoperation for bleeding was also examined separately. The study outcomes were: (a) LOS, defined as the number of days spent in the hospital from the date of surgery to date of discharge; (b) critical care days, defined as the number of days spent on an intensive care or critical care ward from the date of surgery to date of discharge. Multivariable generalized linear models were used to quantify the associations between bleeding complications and the study outcomes, adjusting for measured baseline patient and procedure characteristics and calendar year.
RESULTS: The study included 7,795 cardiac surgery patients (median age = 70.6y, 72% male). Of these, 50.8% of patients underwent CABG, 30.3% valve replacement/repair, 2.1% an aortic procedure, 0.3% heart transplantation, and 16.5% multiple cardiac procedures (primarily CABG + valve); 83% of surgeries were performed with cardiopulmonary bypass; 69% were elective admissions. The incidence of bleeding complications was 74.2 patients per 1,000 among all cardiac surgeries (range 57.8 per 1,000 in CABG alone to 181.8 per 1,000 in heart transplant). The incidence of reoperation for bleeding was 3.5 per 1,000 among all cardiac surgeries (range 2.1 per 1,000 in valve repair/replacement to 18.8 per 1,000 in aortic procedures; 0 reoperations for bleeding were observed in the 22 heart transplant patients). Overall mean unadjusted LOS was 10.8 days (standard deviation = 9.5 days), including a mean of 4.2 days in critical care (standard deviation = 6.0 days). Relative to patients without bleeding complications, patients with bleeding complications had longer LOS (multivariable-adjusted means: 14.0 vs. 10.5 days; difference = 3.5; p < 0.0001) and spent more days in critical care (multivariable-adjusted means: 6.6 vs. 4.0 days; difference = 2.6; p < 0.0001). Reoperation for bleeding was also associated with longer LOS (multivariable-adjusted means: 15.3 vs. 10.8 days; difference = 4.5; p = 0.0009) and more days in critical care (multivariable-adjusted means: 7.8 vs. 4.2 days; difference = 3.6; p = 0.0004).
CONCLUSIONS: Among patients undergoing cardiac surgery patients in England, in-hospital bleeding complications were associated with substantial increases in LOS and critical care utilization. This study quantifies a large healthcare utilization burden associated with bleeding complications in cardiac surgery which may be partially mitigated by increased use of evidence-based strategies to prevent and manage intra- and post-operative bleeding.

SESSION: VASCULAR ABSTRACT SESSION VII: BIOMEDICAL ENGINEERING OF AORTA

TIME: 11:30-12:30

ROOM 4: COLMAR

00248

Biodegradable small diameter vascular prostheses functionalized with protein-loaded nanoparticles

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BACKGROUND: Today the classical concept of tissue engineering, according to which a scaffold is described as a simple extracellular matrix-inspired framework, is overcome. The new emerging idea is to have constructs able to actively interact with cells after implantation. The synthesis of biodegradable scaffolds that guide host cells, releasing growth factors and chemoattractant proteins during the regeneration of the neovessel, is still a challenge. This study is the result of combining our experience in fabricating biodegradable polymeric scaffolds and in synthesizing biocompatible nanoparticles, as presented last years in our previous contributions.
METHODS: We fabricated electrospun scaffolds made of poly (ε-caprolactone) (PCL) and poly (glycerol sebacate) (PGS), previously functionalized with polyphenols in order to modulate inflammation, incorporating calcium carbonate ($CaCO_3$) nanoparticles among fibers. Our scaffolds were obtained by electrospinning (Spinbow, Bologna, Italy) using a solution of PCL:PGS (both 20 % w/v, 1:1 v/v). $CaCO_3$ nanoparticles at the amount of 0.10 % (w/v), previously loaded with proteins able to modulate the regeneration of the neovessel, were directly added to the polymer solution prior to electrospinning. We used a flow rate of 2.20 mL/h, a voltage of 17.0 kV, a rotational and a translational speed of 500 rpm and 600 mm/min, respectively, a polymer solution of 1.50 mL in volume, and a collector of 2.0 mm in diameter. Scanning Electron Microscopy (SEM) analysis was performed to confirm the presence of $CaCO_3$ nanoparticles in the scaffold. Physicochemical properties, mechanical behaviour and the release of protein from the samples were studied. Furthermore, biocompatibility with human endothelial cells EA.hy926 and hemocompatibility of the scaffolds in terms of blood coagulation kinetic and hemolysis were assessed.
RESULTS: SEM analysis of electrospun scaffolds showed randomly oriented fibers with a mean diameter of 2.44 ± 0.04 μm. Scaffolds presented a notable weight loss after the first week of soaking at 37°C, both in the samples with nanoparticles and in those without. The mass loss was more evident for the nano-functionalized scaffolds (approximately

14 and 16 % after 1 and 7 days, respectively), while it was stabilized after 14 days. Slight differences regarding Young's modulus and elongation percentage of scaffolds with and without nanoparticles were reported (7.61 ± 0.92 and 4.91 ± 1.37 MPa, 218.48 ± 27.72 and 576.99 ± 132.50 %, respectively). It was noticed a sustained release of protein during time: 86.80 ± 0.12 % of the protein encapsulated in the nanoparticles was released from the scaffold after 21 days. The biological analysis showed that both the tested scaffolds were highly biocompatible. Hemocompatibility studies revealed good anticoagulant properties and a hemolysis of 0.26 ± 0.01 %.
CONCLUSIONS: Our results show that the functionalized scaffolds had properties comparable with those of the scaffolds without particles, suggesting that the proposed functionalization had no tampering effect on the properties of PCL:PGS constructs. Overall, our results highlight that the nanoparticles we have produced, can be successfully embedded into the fibers during the electrospinning process, paving the way of a gradual release of proteins directly where the scaffolds will be implanted. Therefore, this study demonstrates the feasibility to fabricate a prosthesis functionalized with nanoparticles containing bioactive proteins that could be potentially employed in vascular tissue engineering.

00227

The role aortoiliac morphology plays in isolated common iliac artery aneurysms: a comparison of ruptured and intact cases

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BACKGROUND: Common iliac artery aneurysms (CIAAs) most commonly occur in the presence of an AAA. Understanding the risk of CIAA progression is difficult with limited research into the role of morphology and haemodynamic forces. We aimed to determine if CIAA morphology and haemodynamics relate to their outcome.
METHODS: We assembled an international cohort of rare cases of 25 isolated CIAAs (intact electively-repaired, n = 15; ruptured, n = 10). We reconstructed geometries from computed-tomography angiography (CTA) and analysed each with state of the art computational fluid dynamics (CFD) modelling to quantify haemodynamics. The relationship between time-averaged wall shear stress (TAWSS), oscillatory shear index (OSI), low and oscillatory shear (LOS), velocity data and the geometry of the vessels was assessed. Then a series of 24 idealised aortoiliac geometries were also simulated representing a range of bifurcation and abdominal aorta angles to isolate these effects. Next, a cohort of 163 patients imaged with CTA prior to iliac artery endovascular intervention at Charing Cross (CX) were analysed to compare geometry and severity of the disease with the observations in the isolated CIAA and idealised groups.
RESULTS: In the isolated CIAA cohort, we observed three distinct morphology categories; saccular (n = 9), fusiform (n = 8) and kinked CIA (n = 8). The kinked cases had no ruptures and far less ILT ($p < 0.001$) as well as higher TAWSS ($p = 0.001$) and lower LOS ($p = 0.004$); these computational metrics indicate a low rupture risk in aortic aneurysms. Where aneurysm rupture location was known, high LOS spatially correlated with this location in 5/6 cases. CIAA appeared to be causal for abdominal aortic remodelling towards the aneurysmal side in 74% of the 25 CIAA cases and 96% of the 163 CX cases. Wider iliac bifurcation angles were observed to lead to progression of CIAs through increased LOS and this was confirmed by larger maximum CIA diameter in CX patients with a wide bifurcation angle. After adjusting for maximum diameter the only other characteristic that was predictive of rupture was aneurysm type (non-kinked indicating a high rupture risk).
CONCLUSIONS: Although only 25 patient-specific cases were studied computationally, this is the largest study into the haemodynamics of the disease. Using CFD we were able to observe the dominant effect aortoiliac morphology has on flow both upstream and downstream from bifurcation. Kinked CIA cases are less likely to rupture than other CIAAs ($p=0.047$). Wider bifurcation angle increases aneurysmal susceptibility in the CIAs and aneurysmal disease here appears to be causal for abdominal aortic remodelling. Abdominal aortic deflection creates haemodynamic conditions that are protective from abdominal aortic aneurysm.

00300

Detection of different mechanical properties of native and donor ascending aorta in patient undergoing heart transplantation causing post-transplantation aortic dissectionnt vascular: aortic dissection

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BACKGROUND: Evaluation of "*in vivo*" mechanical properties of ascending aorta has become a key issue in identifying predictive risk factors of acute aortic syndromes in patients presenting with ascending aortic aneurysm. Based on the co-operation with the engineering department of our University we have started to utilize uniaxial tensile stress test on aortic wall specimen harvested during ascending aorta aneurysm replacement. We have already published several studies focus on the potential identification of weakest area of dilated ascending aorta, as well as the role of associate risk factor in reducing the elasticity and strength of ascending aortic wall. As control group we have started to use specimen of ascending aorta (both native and from the donor heart) harvested at the time of heart transplant. Here we present a peculiar case where a significantly different "*in vivo*" biomechanical properties of donor and native aortic wall lead to an asymmetric ascending aorta dilatation involving the native but not the donor aorta.
CASE REPORT: A 65 patients underwent orthotropic heart transplant at our Division due to end-stage dilative cardiomyopathy. At the time of transplant assessment no history of genetic disorder were reported. Six years later the patient was readmitted at our division following a regular follow-up visit for a significant enlargement of ascending aorta. Multi-slide contrast CT scan revealed an asymmetric dilatation of native ascending aorta (max diameter 6 cm) with no involvement of donor ascending aorta (max 3,3 cm). At the time of surgery a cylinder of ascending aorta was harvested both from the native and donor portion of aorta. The specimen were stored in a room-temperature solution of saline injection and directly send to the engineering Department were mechanical tests were performed within 24 hours from the harvesting according to our previously published protocol. Briefly mechanical tests were performed using a MTS Insight Testing System 10 kN (MTS System Corporation). The specimens were preconditioned with loading-unloading cycles and then stretched until rupture at a constant cross-head speed. Experimental stress-stretch curves were used to determine tissue mechanical properties. The typical stress-stretch curve has a J-shaped aspect with a compliant elastin-dominated region at the low-stress range turning into a stiff collagen-dominated region at the high-stress range. With respect to the high-stress region we defined three parameters (ultimate stress test): peak stretch; peak stress σU and elastic modulus EH (MPa) . With respect to the low-stress region we also defined three parameters (initial stress test): peak stretch λT(mm/mm), peak stress σT (MPa) and low elastic modulus EL (MPa) at the transition point. Specimen were also sent for histological evaluation. Results of mechanical tests showed a significant differences between samples of native and donor aorta: As far as ultimate mechanical properties peak stretch λU of native aorta was lower then the donor aorta both when applying circular force (0,164 mm/mm vs 0,365 mm/mm) or longitudinal force (0,201 mm/mm vs 0,392 mm/mm). Peak stress was lower in native aorta especially when applying longitudinal force (0,943 MPa vs 1,364 MPa). Elas-

tic modulus was, conversely, higher in native aorta both in circular and longitudinal tension (15,6 vs 14,8 and 11,4 and 10,212 respectively). Similarly, in the initial mechanical properties analysis, Initial Strain and Stress of native aorta were always lower (and elastic modulus was higher) then those of donor aorta (both with circular and longitudinal tests). In conclusion mechanical properties analysis of native and donor aorta in patient undergoing heart transplant and following asymmetric ascending aorta dilatation clearly shows as intrinsic characteristics of aortic wall are more relevant then hemodynamic aspects in causing significant ascending aorta dilatation.

00224

The application of computational modeling for risk prediction in uncomplicated type B aortic dissection

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BACKGROUND: We are approaching a critical juncture in the management of uncomplicated type B aortic dissection (TBAD). The landmark INSTEAD-XL trial raised questions about the best management for patients who develop late complications. The importance of vascular surgeons being able to predict complications in the acute, sub-acute and chronic phases has been highlighted by INSTEAD-XL and subsequent papers. Risk prediction is currently based on the interpretation of conventional imaging modalities, such as computed tomography (CT) or magnetic resonance imaging (MRI). There are recognised anatomical risk factors in the literature consisting of proximal tear location on aortic concavity, larger tear size, a single entry tear, partial false lumen thrombosis, high baseline or rapidly expanding aortic diameter, and higher fusiform index. However, accurate and objective risk assessment has been challenging up to this point in time. New tools are urgently needed to help with surgical decision-making in uncomplicated TBAD, thus the role of patient-specific computational modelling is now becoming more apparent.
CASE REPORT: We summarise the current literature around computational modelling in uncomplicated TBAD, with a focus on risk prediction. Computational modelling finds its basis in computational fluid dynamics (CFD). It can be used to produce numerically calculated values of flow velocities, pressures and wall shear stresses which are difficult to measure *in vivo*. Identifying the role that these factors play in the development of complications will mean that they can be used in risk prediction. Through a review of the literature, we identify common themes which will likely direct future studies in larger cohort prospective studies. We report on the technical work which has helped develop our current methods of modelling, and further advances which may be necessary to create even more realistic models and accurate results. We highlight the biomechanical and haemodynamic factors contributing to complications such as malperfusion, dilatation, propagation and rupture. Specifically, we explore the application of modelling to false lumen thrombosis and identification of pressure differences between the true and false lumen during the cardiac cycle. Our discussion includes the suggested workflow when computational modelling is integrated into the clinical environment, and the role it will be able to play as a risk prediction tool used by vascular surgeons internationally.

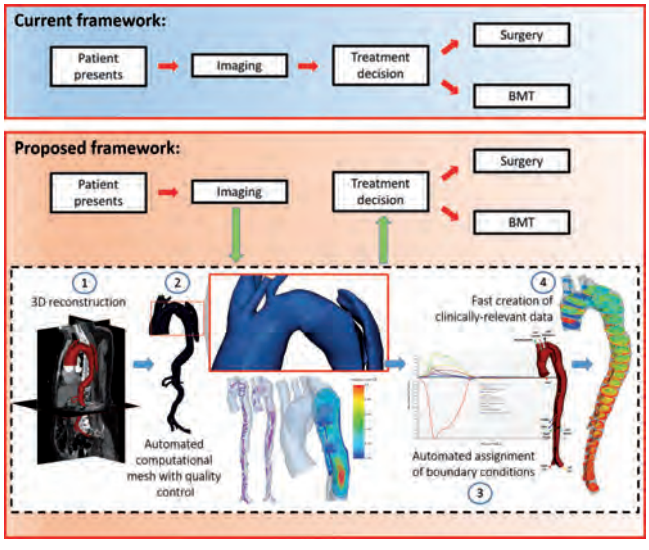

Figure 1.

00172

Thoracic stent-graft migration: the role of the geometric modifications of the stent-graft at 3 years

B. Nasr [1, 2, 3], J. Savean [2], B. Albert [1], A. Badra [1], J. Braesco [1], P. Gouny [1, 3], D. Visvikis [2], H. Fayad [2, 3]

[1]Service de Chirurgie Vasculaire, CHU Brest, Brest, France; [2]INSERM UMR 1101, LaTIM, CHU Morvan, Brest, France; [3]Université de Bretagne Occidentale, Brest, France

BACKGROUND: In this study, we analysed the geometric evolution of the aortic stent-graft in the proximal landing zone ter-

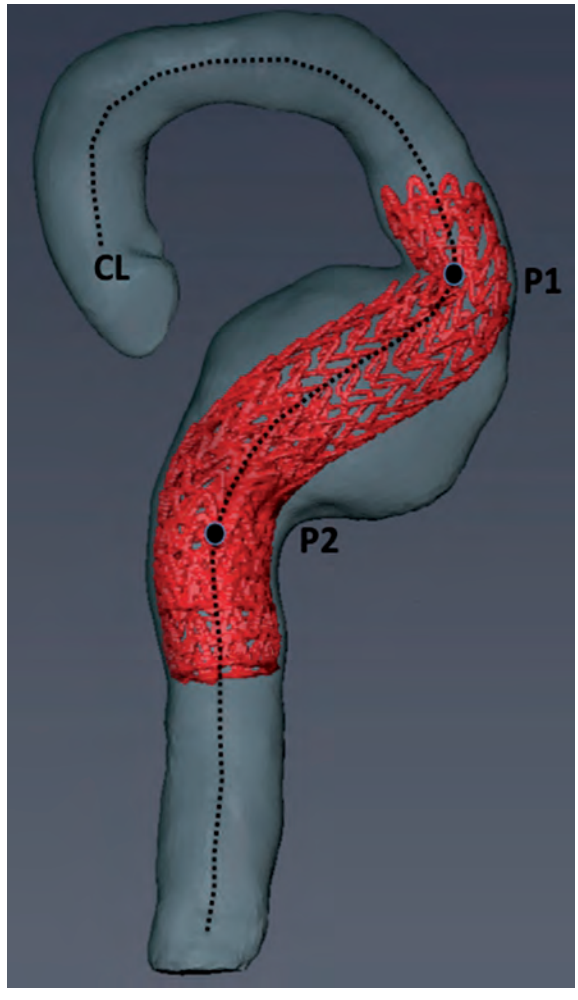

Figure 1.

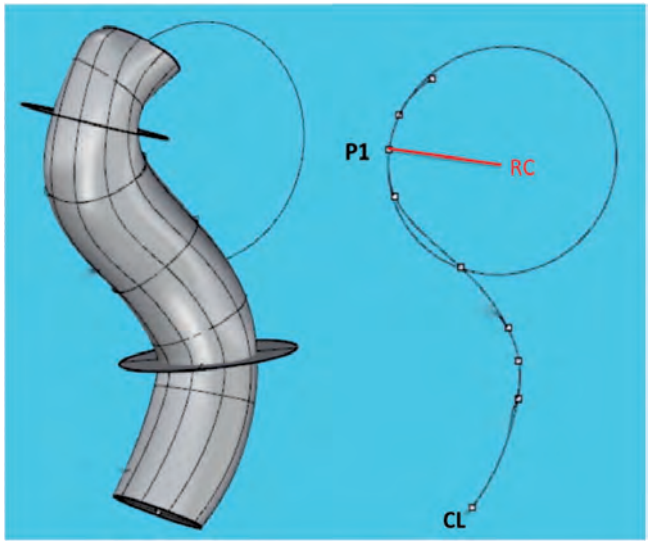

Figure 2.

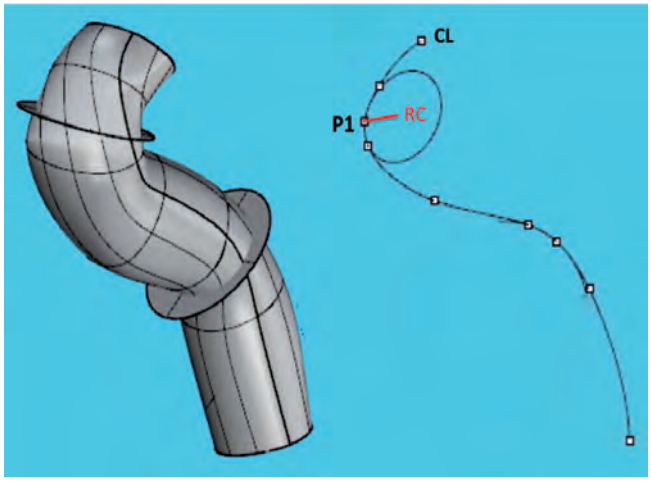

Figure 3.

mination at mid-term follow-up and its impact on the stent-graft (SG) migration.
METHODS: Sixty-two patients underwent thoracic endovascular aortic repair (TEVAR) for thoracic aortic aneurysm from 2007 till 2013. Of these, 30 patients were treated for aneurysmal pathology and had a complete clinical and morphological follow-up at 1 month and 3 years. A standardized protocol was used to complete measurements of the anatomical characteristics at the preoperative CT-Scan, at 30-day imaging, and at 3-year imaging. A blinded measurement of the stent-graft radius of curvature (RC) change at the proximal landing zone termination "p" was performed at 30-day and 3-year CT-Scan. A RC decrease indicates a curvature increase.
RESULTS: There were 19 atheromatous aneurysms, 8 post-dissection aneurysms and 3 post-traumatic aneurysms. Two patients were treated at zone 1, seven at zone 2, and twenty-one at zone 3. The median decrease of the RC at "P" was of 11 mm (Interquartile range IQR, 6.5 mm; range, 1-29 mm). A greater decrease in RC was identified in patients with hostile proximal neck having: large diameter (P= .006), short neck length (P= .04), and neck thrombus grade II and III (P= .02). In the migration group, the RC of "P" decreased significantly at 3 years (27.5 mm vs 18.25 mm; P= .03). Three patients had type I endoleak and showed a decrease of the RC at "P" (42 vs 13 mm; 28 vs 15 mm; 24 vs 9 mm).
CONCLUSIONS: The proximal stent-graft attachment zone seems to have geometric changes over the time. The increase of proximal stent-graft curvature might be a predictor for stent-graft migration, and may prompt prophylactic re-intervention.

00285
Computer simulation of atherosclerosis development in the coronary arteries

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BACKGROUND: Atherosclerosis begins with endothelial dysfunction, which favors lipid and cell elements crossing inside blood vessel wall. Mechanical forces such as low shear stress are implicated in plaque formation and development. It is now well known that the early stage of the inflammatory disease is the result of interaction between plasma low density lipoproteins that filtrate through endothelium into the intima, cellular components (monocytes/macrophages, endothelial cells and smooth muscle cells) and the extracellular matrix of the arterial wall. The objective of this study is to examine influence of wall shear stress on the atherosclerosis development and virtual calculation of FFR (Fractional Flow Reserve).
METHODS: The Navier–Stokes equation, together with the continuity equation, was used to describe the three-dimensional blood flow. Mass transfer within the blood lumen and through the arterial wall is coupled with the blood flow and is modeled by a convection–diffusion equation. Kedem–Katchalsky equations were used for transports the low-density lipoproteins in the lumen and throw the vessel tissue. The inflammatory process is modeled using three additional reaction–diffusion partial differential equations. Virtual FFR is calculated with in-house software PAKF. We tested integral values of FFR calculated within different flow rate and pressure difference as boundary conditions for coronary bifurcation.
RESULTS: he results for plaque concentration for the several coronary arteries and virtual FFR calculations are presented. The biomolecular parameters cholesterol, LDL, HDL and Triglycerides for the specific patient are used in computer simulation. The results has been shown that intra-plaque WSS values were lower at baseline when it is compared to the follow up situation. The maximal plaque concentration directly gives plaque volume for the left and right specific patient coronary artery (Figure 1).

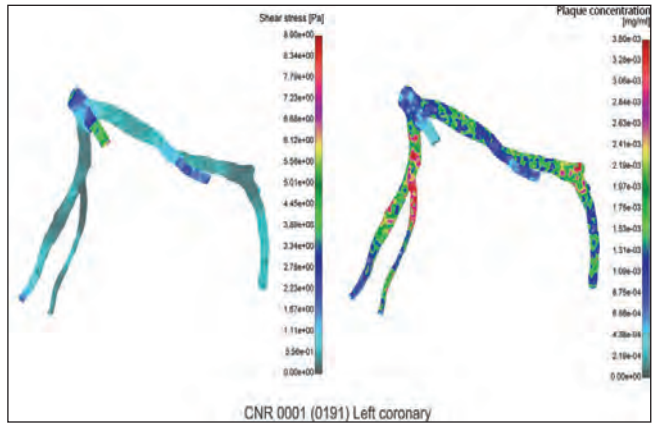

Figure 1.

Virtual FFR in comparison with measurement values gives good correlation.
CONCLUSIONS: Computer simulations data for the specific patient for the left and right coronary arteries for plaque position and volume are presented. Also virtual FFR is compared with measurement values. It could be used for future diagnostic system for prediction of plaque development.

00226

Computational fluid dynamics: a tool for pre-surgical planning in aortic dissection

L.P. Parker [1, 2], L.J. Kelsey [1, 2], J. Powell [3], I. Koncar [4], N. Sakalihasan [5], S. Jansen [6, 7, 8, 9], P.E. Norman [1, 10], B.J Doyle [1, 2, 11]

[1]Vascular Engineering Laboratory, Harry Perkins Institute of Medical Research, Perth, Australia; [2]School of Engineering, The University of Western Australia, Crawley, Australia; [3]Vascular Surgery Research Group, Imperial College London, UK; [4]Clinic for Vascular and Endovascular Surgery, Serbian Clinical Center, Belgrade, Serbia and Belgrade Medical School, University of Belgrade, Belgrade, Serbia; [5]Cardiovascular and Thoracic Surgery Department, University Hospital Liege, Liege, Belgium; [6]Department of Vascular and Endovascular Surgery, Sir Charles Gairdner Hospital, Perth, Australia; [7]School of Public Health, Curtin University, Perth, Australia; [8]Faculty of Health and Medical Sciences, The University of Western Australia, Crawley, Australia; [9]Heart Research Institute, Harry Perkins Institute of Medical Research, Perth, Australia; [10]Medical School, The University of Western Australia, Crawley, Australia; [11]BHF Centre for Cardiovascular Science, The University of Edinburgh, Edinburgh, UK

BACKGROUND: The optimal treatment of aortic dissection in the descending aorta remains highly contentious. Here we use state of the art computational modelling of a very complex case of aortic disease to simulate the hemodynamic outcomes of a number of different intervention strategies and compare them to a simulation of post-operative conditions.
METHODS: Our subject was a 60 year old male patient who presented with chronic aortic dissection. He had previously undergone a Bentall procedure as well as aortoiliac bypass which resulted in a 6.3 cm pseudoaneurysm at the anastomotic site. The contralateral anastomotic site and distal abdominal aorta also showed early signs of dilatation. Three-dimensional reconstructions were created from CT. Eight surgical interventions, one medical treatment and two cases of particular clinical interest (targeted tear occlusions) were implemented using computer-aided design. The post-operative CT obtained 4.6 months after implantation of an iliac stent graft was also reconstructed and all scenarios were analysed using computational fluid dynamics (CFD) recording results for time-averaged wall shear stress, oscillatory shear index, low and oscillatory shear and velocity throughout the models.
RESULTS: A femorofemoral bypass after occlusion of the common iliac artery aneurysm created the optimum overall haemodynamics and had positive secondary effects reducing the likelihood of further dilatation in the distal abdominal aorta and contralateral common iliac artery. Occlusion of the false lumen by closure of the entry tear or implantation of an uncovered stent showed the greatest improvement in hemodynamic conditions within the true lumen and had positive downstream effects in the iliac arteries. Closure of the distal re-entry tear also showed potential in the distal abdominal aorta by reducing true lumen stagnation. We also observe that blood pressure treatment reduces shear stress, increasing thrombogenesis throughout.
CONCLUSIONS: Computational modelling is effective in predicting the hemodynamic consequences of intervention strategies in complex aortoiliac disease. CFD modelling provides further benefit to the surgeon by quantifying the secondary effects of an intervention up and downstream. Tear geometry greatly influences hemodynamic conditions in the dissected aorta and iliac arteries and modelling can be used to quantify these effects. The question of whether to encourage a fully patent or fully thrombosed false lumen in chronic dissection remains and is likely to be complex and case-specific, well suited to CFD analysis.

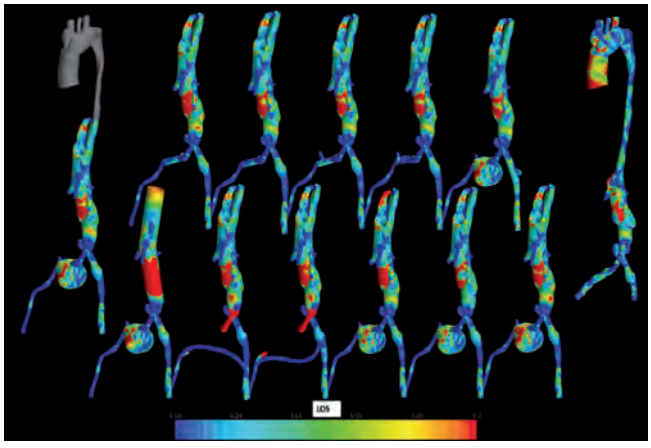

Figure 1.

00265

Mathematical tool for morphological classification of abdominal aortic aneurysms based on geometric parameters

M.Á. Pérez Rueda [1, 2], F. Nieto Palomo [1, 3], L.M. Lipsa [1, 3], C. Vaquero Puerta [1, 4], G. Vilalta Alonso [1, 5], J.A. Vilalta Alonso [6], E. Soudah [7], V. Requejo de la Fuente [2]

[1]Instituto de la Tecnologías Avanzadas de la Producción (ITAP), University of Valladolid, Valladolid, Spain; [2]Department of Mechanical Engineering, University of Valladolid, Valladolid, Spain; [3]Mechanical Engineering Division, CARTIF, Technological Center, Boecillo, Valladolid, Spain; [4]University and Clinic Hospital of Valladolid, Valladolid, Spain; [5]Thermal Sciences and Fluid Department, Federal University of São João del-Rei (UFSJ), São João del-Rei, Brazil; [6]Industrial Engineering Department, Polytechnical University of Havana, Havana, Cuba; [7]International Center for Numerical Methods in Engineering (CIMNE), Technical University of Catalonia, Barcelona, Spain

BACKGROUND: Identification of geometric parameters capable of defining in a complete way the shape of different types of aneurysms. Realization of a morphological classification composed of different types of aneurysms with similar morphological characteristics and using our cases. In addition an executable program will be made, easily usable by the AAA specialist, for the detection of cases of new patients following the methodology developed in this work.
METHODS: Based on the data of 29 patients, with 29 follow-ups distributed among them. The data of the geometric characteristics of each one, besides the files of the modeling in 3D of all the cases. With these data we generate a function conformed with a set of weighted coefficients, which when multiplying it linearly by the value of our parameters will yield a morphological index:

$$IMc=(c1\bullet Tdd)+(c2/Id)+(c3\bullet(V/S)\bullet 1000)+(c4\bullet T)+(c5\bullet(RC/100))+(c6/Asim)$$

Being: Tdd: deformation rate, Id: saccular index, V / S: Volume between surface of the sac, T: tortuosity, RC: curvature relation, Asim: asymmetry of the sac.
RESULTS: In this work, a fully automated computer tool has been developed that allows the surgeon to easily identify an abdominal aortic aneurysm within this novel classification. For this purpose, geometrical parameters combined with each other will be used to form dimensionless parameters characteristic of the morphology of the aneurysm. In this way, a more complete and accurate disease detection methodology will be established than those previously carried out.
CONCLUSIONS: Using the calculated IM value (IMc), we have validated the classification with the value of the growth rate. The observations made are that in more than 75% the IM increased from the initial cases to the follow-ups, except in isolated cases. From these results a classification has been made with seven perfectly characterized groups of AAA. Each of the groups with their own specific characteristics that will be detailed by the relative parameters that provide the greatest correlation with the IMc.

SESSION: CARDIAC ABSTRACT SESSION IX: NURSING IN CARDIOLOGY AND CARDIAC SURGERY

TIME: 14:00-15:00

ROOM 4: COLMAR

00214

Benefits for patients and healthcare providers using a novel, self-contained chest drainage system assessed in a randomized, prospective study

L. Barozzi [1], L. San Biagio [1], M. Meneguzzi [1], D. Courvoisier [2], G. Faggian [1], B. Walpoth [3]

[1]Division of Cardiac Surgery, University of Verona, Verona, Italy; [2]Quality of Care Unit, University Hospital, Geneva, Switzerland; [3]Department of Cardiovascular Surgery, University Hospital, Geneva, Switzerland

BACKGROUND: Post-operative chest drainage systems and drains vary greatly in cardiac surgery and are mostly based on water seal and wall suction. A new, self-contained, electronic, continuous pump-driven drainage system (non-stop suction from the OR to chest-tube removal), is compared to a traditional wall-suction system in cardiac surgery. This new system is tested in a prospective, randomized study.
METHODS: One hundred and twenty adult elective cardiac patients undergoing CABG and/or valve surgery were randomized to the study group (n=60 Thopaz+ self-contained drainage system, Medela AG, Switzerland) or control group (n=60 wall suction drainage system, Argyle Aqua-Seal, Covidien, USA). Unstable angina, emergency procedures, off-pump surgery or full anticoagulation were exclusion criteria. Both groups had the same chest tubes sizes and similar pre-operative demographic criteria: age 67.8 vs. 67.0 years, Euroscore 2.3 vs. 2.2 and BSA 1.92 vs. 1.91 m2 respectively for the study and control groups. Co-morbidity prevalence and length of pre-operative anticoagulation withdrawal interval were also similar. Additionally, a satisfaction assessment score was performed by 52 staff members (doctors and nurses) who were involved in the study.
RESULTS: Given homogenous intra-operative variables, total chest-tube drainage was comparable among groups (566 vs. 640 ml; ns), but the study group showed more efficient fluid collection during the early post-operative phase and during transport to ICU ($p = 0.006$ and $p = 0.01$) due to continuous suction compared to 11.5 minutes off-suction time in the control group. Blood and cell saver transfusions were similar in both groups. Post-operative hemoglobin values showed no significant difference between the two groups at the end of surgery, on day-1 and at discharge. The study group also experienced quicker drain removal (29.8 vs 38.4 hours). No patient had drain-related complications (pericardial effusion, tamponade, pneumothorax).
CONCLUSIONS: The new, self-contained, electronic, continuous pump-driven drainage system showed more efficient early drainage of the chest cavity and was as safe as conventional systems. Quicker drain removal might impact on ICU stay and reduce costs. Additional advantages are portable size and autonomous battery operation (i.e. allowing earlier patient mobility), noiseless function, digital indications and alarms. The satisfaction assessment of the new system by the staff revealed a higher score when compared to the traditional wall suction chest drainage system.

00255

Comprehensive geriatric assessment and frailty in elderly patients undergoing cardiac surgery

M.M. Lopez-Tatis, J.M. Gonzalez-Santos, F.J. López-Rodríguez, M.E. Arnáiz-García, A. Arevalo-Abascal, A.M. Barral Varela, C. Amoros Rivera

Complejo Asistencial Universitario de Salamanca, Salamanca, Spain

BACKGROUND: To describe the population of patients over 70 years old undergoing cardiac surgery procedures at our hospital by using a Comprehensive Geriatric Assessment (CGA) and to compare two frailty scores; 5 -item FRAIL scale (Fatigue, Resistance, Ambulation, illnesses and Loss of Weight) and Fried criteria (unintentional weight loss, weakness, self-reported exhaustion, slowness of gait speed and low activity).
METHODS: We included 60 patients over 70 years old accepted for cardiac surgery in our hospital from October 2017 to January 2018. The CGA includes cognitive status evaluation using the Montreal Cognitive Assessment (MOCA), the Yesavage geriatric depression scale, activities of daily living (ADL) Katz score, instrumental activities of daily living (IADL) Lawton, the 5-item FRAIL scale and Fried criteria and for nutritional status the Mini-nutritional Assessment short form (MNA). The population was selected from the preoperative cardiac surgery practice and from non-emergent patients from the cardiac surgery/cardiology wards and the coronary acute care unit. In this initial analysis we include the type of cardiopathy, sociodemographic data, background and co-morbidities. Data was analyzed using SPSS statistics. A comparison between the FRAIL and FRIED scores was established using the Chi square test. In this presentation we only include the preoperative data.
RESULTS: Age ranged from 70 - 84 years, Median age was 76,15 +/- 3,77 years, male 68.3 %, history of hypertension 74.6 %, diabetes 35 %, dyslipemia 59 %, COPD 11 %, history of stroke 3.2 %. The EuroScore II was 3,78 +/- 2,71 %; 54,4 % were in Class III from the New York Heart Association classification. The type of cardiopathy was coronary 31 %, valvular 76 %, combined valvular and coronary disease 17.5 %, ascending aortic aneurysm 5 %, combined valvular disease and ascending aortic aneurysm 3.2 %.The functional status with the IADL Lawton scale was 5,95 +/- 1,95, the ADL Katz score was 98.3% independent, the MOCA Test had a mean of 20,67 +/- 4,67, depression was present in 26.7 %,for nutritional status 50% were at risk of malnutrition, 3.3% had malnutrition, 46.7 % had normal nutritional status. Most of the patients using the FRAIL questionnaire are frail, 55%, 40% prefrail, 5 % robust. Using the FRIED scale; 45% frail, 43.3% prefrail and 11.7% are robust. We found statically significant differences between the two scales, p (0,000). The FRAIL scale has more patients in the frail category and less in the robust category compared with the FRIED scale, which classifies a larger population as prefrail.
CONCLUSIONS: The population of our center is predominately male, very old and with a high prevalence of frailty. A large part of them are at risk of malnutrition and have cognitive impairment, yet they are independent enough for daily activities. The majority has hypertension and other cardiovascular risk factors. The most frequent intervention in our elderly population is valvular replacement. A CGA and frailty criteria is an additional tool that can increase the precision in the decision making in the elderly patients undergoing cardiac surgery. It might help identify who could benefit more from the intervention or the need for preconditioning before the surgery.

SESSION: BEST CARDIAC POSTER SESSION

TIME: 16:00-17:00

ROOM 4: COLMAR

00157

Retrograde cellular cardiomyoplasty through the coronary sinus: an experimental study on swines

E. Prifti [1], G. Di Lascio [2], G. Harmelin [2], D. Bani [2], V. Briganti [2], A. Veshti [2], K. Menkshi [2], M. Bonacchi [2]

[1]Division of Cardiac Surgery, University Hospital Center of Tirana, Tirana, Albania; [2]Section of Cardiac Surgery, Department of Experimental and Clinical Medicine, University of Florence, Florence, Italy

BACKGROUND: The aim was to create a model of myocardial infarction (AMI) with a borderline myocardial impairment which would enables to evaluate the retrograde cellular cardiomyoplasty (CCM) through the coronary sinus in a large animal model.
METHODS: Experience has been carried out in 25 juvenile farm pigs, of

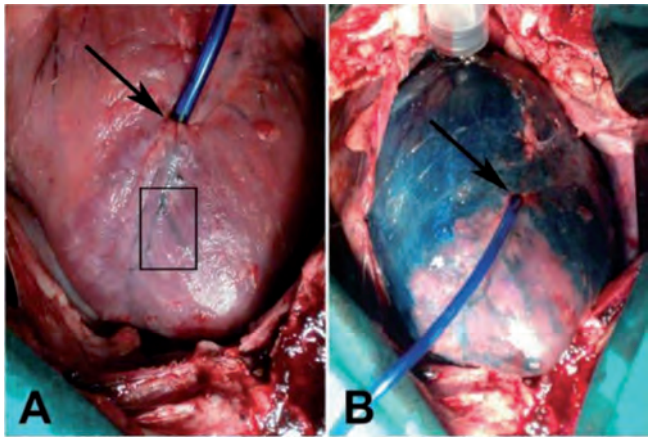

Figure 1.

both sexes, weighing 35 to 40 Kg. 15 were subjected to the procedure, 10 were used as control. All animals underwent a right antero-lateral thoracotomy on the fifth intercostal space was made, and the left anterior descending artery was ligated after the emission of the second diagonal (Figure 1). Almost one month later the animals in the study group underwent a midline sternotomy and a murine myoblastic line C2-C12 in 20 cc of medium was injected at a constant pressure of 30 mmHg, with the balloon inflated through a 20 minutes interval into the coronary sinus through a a Swann-Ganz catheter. 30 days later all survived animals from the study group and the control group underwent transthoracic echocardiography and 99 Tc MIBI Gated Scintigraphy evaluation and later were euthanized through a midline sternotomy and specimens were taken from the left ventricle for mycroscopic evaluation.
RESULTS: In all animals CkMb, Troponine and Myoglobin, showed a progressive rise of CPK-Mb and of Troponine I during the observation period reaching the maximum values within 12 hours after MI while Myoglobin reached its maximum level within 4 hours after AMI. Cardiac output decreased significantly after AMI ($p<0.001$) and remained low until CCM and increased significantly at the time when the animal was sacrificed *versus* the values after AMI ($p<0.001$) but comparable to the baseline values (p=ns). Pulmonary artery pressure increased significantly after AMI ($p<0.001$) and improved before the animals' sacrifice *versus* the post AMI values ($p<0.001$). Instead in the control group such values remained the same at the time of sacrifice compared to the post AMI values. In all animals, the surgical induction of AMI caused a marked decline in the echocardiographic values of cardiac function regarding the LVEF, LVEDV, LVESV and MPI. However the cardiac function and dimensions were significantly improved in the study group *versus* the control group after CCM. All animals undergoing CCM demonstrated a significant reduction of the perfusion deficit in the LAD territory after CCM, instead such data remained unchanged in the control group. The histological examination demonstrated the engrafted myoblasts could be distinguished from the activated fibroblasts in the scar tissue because they never showed any signs of collagen secretion and fiber buildup. The engrafted myoblasts were mainly found in the AMI area borderline.
CONCLUSIONS: As conclusion, our study provides data in support of the following issues: the venous retrograde delivery route through the CS is safe and effective; CCM provides a significant improvement in function and viability.

00371

Acute type A aortic syndrome: towards a more systematic aortic root replacement?

A. Sebestyen, V. Le Guillou, F. Bouchart, A. Tabley, C. Aludaat, F. Doguet

Cardiovascular and Thoracic Surgery Unit, Univerity Hospital of Rouen, Rouen, France

BACKGROUND: Acute type A aortic syndrome (ATAAS) is a life-threatening disease for which the replacement of the ascending aorta is

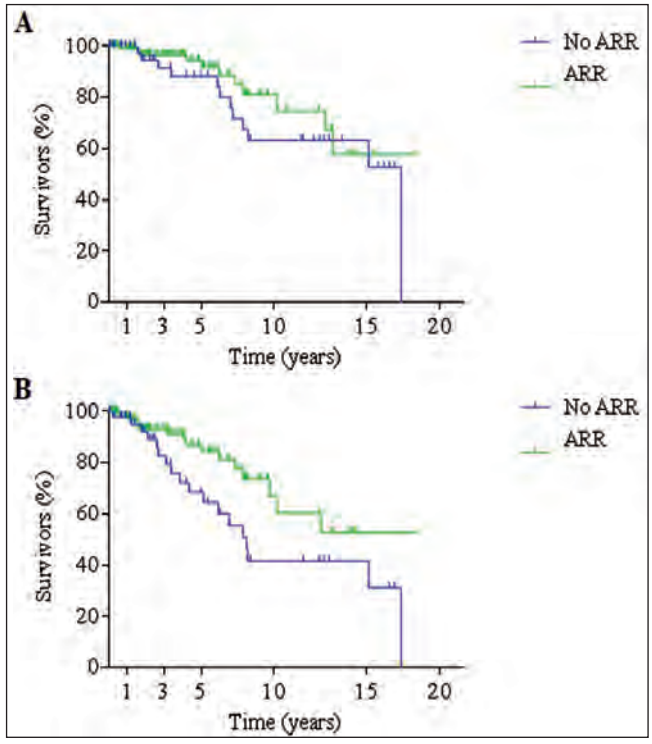

Figure 1.

recommended. Aortic root replacement (ARR) is generally not realized because of the risk to increase postoperative morbidity, but the risk of late aneurysm and redo suggested some authors to realize it first. We reported our experience and measured the impact of ARR on perioperative mortality and late redo on the aortic root.
METHODS: We reported the patients who were operated for ATAAS in our single center from January 2000 to December 2015. All the patients underwent surgery regardless their preoperative status. The surgical strategy is decided by the surgeon: femoral canulation was generally used, ARR techniques were either Bentall or David I procedures, and we generally used a selective anterograde perfusion of the two carotids during the reparation of the aortic arch. All the patients who survived were called back in 2017. We realized a multiple logistic regression to determine the independent risk factors among the preoperative condition, the pathology and the surgical strategy, defined by an adjusted odds ratio (aOR) different from 1.
RESULTS: Two hundred and five patients were reported, of whom 168 (82%) classical aortic dissection were diagnosed. Aortic root was damaged in 113 (55%) patients. Bentall procedure with hemiarch replacement was the most often realized (31%). ARR was realized in 143 (69%) patients: 101 (49%) Bentall and 42 (20%) David. Thirty-seven (18%) complete arch replacement was realized. The time of cardiopulmonary bypass was 184 [150.75-224.5] minutes. Forty-nine (24%) patients died during the perioperative, of whom 12 (6%) died in operating room, and only severe acidosis, defined by a pH less than 7.20 at the begininning of the cardiopulmonary bypass, was a preoperative independent risk factor of death (adjusted aOR = 5.95 [1,88-18,84]). The median of survey was 1241.5 [530-2620.75] days, and 16 (10%) of the survivors were lost to follow-up. Sixteen (10%) patients presented a late complication on the aortic root, mainly aortic regurgitation and/or aneurysm superior than 55 mm (4%), and 12 (8%) of them underwent redo. Twenty-six (17%) died during the follow-up, of whom 2 (1%) after redo on the aortic root. Elderly age and ARR were independent protective factors of complications on the aortic root (respectively, aOR = 0,95 [0.90-0.98] and aOR = 0.14 [0.04-0.44]), whereas the pathology did not differ. The threshold of the age was 60,5 years. Global survey (Figure 1A) did

not differ according the surgical strategy, but ARR improved free-redo survey (Figure 1B).
CONCLUSIONS: Only the preoperative conditions of ATAAS seem to impact the postoperative mortality, whereas ARR decreases the risk of redo on the aortic root. If ARR is mastered, it should be considered to realize it, particularly in young patients because of their greatest life expectancy and their highest probability to have a constitutional weakness of the aortic root which increase both the risk of redo.

00269

Cardiac surgery in the oldest old: an analysis of mortality in the octogenarian population in the last five years

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BACKGROUND: To analyze the mortality observed in the octogenarian population that underwent cardiac surgery procedures at our center in the last five years and to evaluate which factors could help predict mortality in this population.
METHODS: 258 patients over 79 years old underwent cardiac surgery procedures using extracorporeal circulation at our center from January 2013 to December 2017. They are all included in this report. We performed a retrospective analysis using data from a SICCS database that is completed prospectively with all information from the patients. Data was exported to SPSS statistics were central tendency and dispersion values were analyzed. We used the Chi square test to evaluate the influence of the nominal variables had on mortality. We used Pearson's coefficient to determine correlations between numerical variables.
RESULTS: Mean age was 81,70 +/- 1,44 years with a range of 80 - 86 years. But half of the patients were under 81 years old. 57,4 % were male. 76 % presented hypertension (HT), 29,1 % had diabetes, 5 % using insulin. 70,2 % were non-smokers and 55 % had high cholesterol. 10,1 % had previous vascular disease. 4,7 % had Chronic Obstructive Pulmonary Disease (COPD). 4,3 % had suffered a previous cerebrovascular accident (CVA). 15,5 % had previous history of cancer. Mean serum creatinine was 1,09 +/- 0,51 mg/dL. According to the New York Heart Association (NYHA) they were classified as class I: 9,7 %, class II: 36 %, class III: 38,0 % and class IV: 16,3 %. According to the Canadian Cardiovascular Society Grading System for Stable Angina (CCS) 28,3 % were class III-IV. 70,9 % had a normal ejection fraction. 25,6 % had moderate pulmonary hypertension (PHT) and 15,1 % had severe PHT. 49,2 % had coronary disease, 73,3 % had valvular disease, 25,2 % had both pathologies. 4,3 % had ascending aortic aneurysms, associated in 3,5 %. Priority of the surgery was urgent or emergent in 10,3 %. The mean Euroscore II (ESII) was 7,77 +/- 8,3 %. With 24,03 % of the population ranked as high risk. The in-hospital mortality was 6,98 % (n: 18). We observed a Mortality Adjusted by Risk Index (MARI) of 0,89. Meaning we only observed 89 % of the expected mortality. The length of stay had a range from 1 to 375 days, with a median of 11 days. With a duration of Intensive Care Unit (ICU) of 1-49 days, median of 2 days. The factors that showed statistically significant relations to mortality were: ESII > 10%, p (0,01), poor NYHA class, p (0.006), NYHA class IV, p (0,002), Emergency surgery, p (0,000), coronary and valvular procedure p (0,02); combined mitral and coronary surgery, p (0,000), four or more procedures, p (0,000). High CCS, p (0,003), Ejection fraction, p (0,006), days of ICU, p (0,000), and obesity, p (0,001). Older age was not related to mortality, length of stay or ICU time.
CONCLUSIONS: Octogenarians are the fastest growing population group in Spain and every year they live longer. A lot of octogenarians are best treated with percutaneous approaches, but predictions of the mortality of the surgical octogenarian has never been more important and surgery can be done with low risk in most circumstances. The ESII was able closely predict mortality in our sample, but more specific characteristics showed even more correlation. These findings could help us identify the patients that would benefit less from surgery in the future.

00046

Notch signaling dictates vascular smooth muscle cell death and differentiation in bicuspid aortic valve aortopathy

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BACKGROUND: Bicuspid aortic valve disease (BAV) is the most common congenital cardiac abnormality affecting approximately 1 – 2% of the population worldwide and is associated with a significantly increased risk of ascending aortic aneurysm. Apoptosis of vascular smooth muscle cells (VSMCs) is a long-established histological hallmark of BAV aortopathy. More recently, mutations in the NOTCH1 gene, which dictates cell fate decisions (including differentiation and apoptosis) have been identified in BAV patients. The aim of this study was to elucidate the role of NOTCH signalling in VSMC apoptosis and differentiation in BAV aortopathy.
METHODS: Ascending aortic biopsies were obtained intraoperatively from patients with tricuspid aortic valves (TAV; n=12) and BAV (n=19) undergoing aortic valve surgery. Demographic data, including maximum ascending aortic diameter were collected. Aneurysm was classified as maximum diameter ≥45mm. Apoptotic VSMC were counted by light microscopy of mounted samples following terminal deoxynucleotidyl transferase (TdT) dUTP Nick-End Labeling (TUNEL), which identifies double-stranded DNA breaks. Tissue gene expression was calculated using real-time quantitative PCR with primers to NOTCH signalling, apoptotic and VSMC differentiation genes (NOTCH1, HES1, BAX, BCL-2, MYH10, MYH11 and CNN1). Ascending aortic VSMCs were isolated and cultured from the biopsies. NOTCH signalling was inhibited with N-[N-(3,5-difluorophenacetyl)-L-alanyl]-S-phenylglycine t-butyl ester (DAPT) and gene expression changes quantified. Statistical analysis was performed using one-way ANOVA with Tukey's post-hoc test for multiple comparisons between the groups (IBM SPSS Statistics package; v24). $P<0.05$ was taken as statistically significant.
RESULTS: Apoptotic cell count was significantly higher in BAV patients compared to TAV (+192%, p=0.033). Furthermore, there was a trend towards reduced apoptotic cell count in the aneurysmal groups (TAV=-528%, BAV=-99.5%; p=0.087), in parallel to an increased apoptotic gene expression ratio in the TAV group (+193%; p=0.0001), indicating a mismatch between observed and molecular tendency to apoptosis. It was then hypothesised that this was due to VSMCs becoming resistant to apoptosis through differentiation, which was confirmed with BAV aortas demonstrated a significantly greater ratio of contractile to synthetic gene expression than TAV (+39%; p=0.022). Given the implication of NOTCH in BAV disease and cell cycle processes, it was hypothesised that defective NOTCH signalling may underlie these differences. Indeed, significantly elevated HES1 expression (downstream target of NOTCH) was found in BAV patients with non-aneurysmal aortas compared to TAV patients with non-aneurysmal aortas (+111%, p=0.022). Although not statistically significant, HES1 expression decreased with progression of aortopathy in the BAV group (-30%, p=0.373), and increased in the TAV group (+91%, p=0.089). The reduction in HES1 gene expression in the BAV group as aneurysm progressed was associated with marginally increased apoptotic and contractile gene expression ratios (+18% and +28% respectively), although these were not statistically significant (p=0.8). Thus, reduced NOTCH signalling activation as BAV aortopathy progresses appeared to promote the contractile phenotype and apoptotic gene expression. Inhibition of NOTCH signalling with DAPT confirmed these trends, demonstrating increased contractile gene (+32%) and apoptotic gene (+28%) expression ratio in treated *versus* non-treated BAV VSMC cultures (p>0.05).
CONCLUSIONS: This study demonstrates that increased NOTCH activation in non-aneurysmal BAV aortas may represent a pathological compensatory mechanism to reduce VSMC apoptosis and differentiation. With increasing aortic diameter, decreased NOTCH signalling may promote pro-apoptotic gene expression and induce contractile VSMC differentiation, further sensitising them to apoptosis. These results support the suggestion that defective NOTCH signalling may

underlie the pathological mechanisms of BAV disease and predispose patients to aortopathy. The study highlights a fruitful area for further research into the mechanisms of BAV aortopathy, and provides valuable pilot data for implementing a large-scale follow-up study.

00209

Results of band *versus* ring tricuspid annuloplasty

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BACKGROUND: Despite very long history of tricuspid valve (TV) surgery, it was known as "forgotten valve" due to less works on it compared to other heart valves especially Mitral valve. Suture annuloplasty techniques like Bicuspidization and Devega procedures have been used but now ring annuloplasty is the reasonable technique for tricuspid valve repair. Conventionally a c-shaped ring (band) is used in order to avoid atrioventricular(AV) block. But in respect to valve repair rules for re-shaping the valve to have more durable results, it seems practicable to use a complete ring. We sought to evaluate the results of complete ring annuloplasty for tricuspid valve repair.
METHODS: From 2006 to 2016, 448 tricuspid valve repair procedures were performed in our center of which 17 patients repaired with complete ring annuloplasty (RA) that is made for mitral valve repair. For comparative study, we selected 17 patients who underwent annuloplasty with c-shaped band Annuloplasty (BA) which is designed exclusively for TV repair. All the procedures were done in arrested heart. The patients in both groups had grade IV (93.3% in BA group and 82.4% in RA group) or grade III (6.7% in BA group and 17.6% in RA group) tricuspid regurgitation(TR), mostly due to rheumatic heart disease (72.7% in BA group and 30% in RA group). There were concomitant procedures in both groups (66.7% in BA group and 52.9% in RA group). We assessed patients and procedure's data with emphasis on freedom from AV block and residual TR.
RESULTS: Mean age was 40.0±13.7 and 42.2±16.1 years and median of follow up duration was 56.7 months (3.5 to 69.7) and 3.28 months (0.7 to 39.1) in BA and RA groups respectively. There was no mortality in both groups. During follow up, mean pulmonary artery pressure was 40.7±17.0 and 33±6.6 mmHg, in BA and RA groups respectively. Freedom from more than moderate TR was 53.8% and 43.8% (p value= 0.19), freedom from AV block was 100% and 93.8% (p value= 0.18) in BA and RA groups respectively without statistically significant difference. There were no reoperation for residual TR in both group.
CONCLUSIONS: Our study showed although ring annuloplasty with c-shaped band has become prevalent with good results, but using complete rings also have acceptable results without increasing complications especially conduction disturbance. Further larger study is required to evaluate complete ring annuloplasty results more precisely for tricuspid valve repair.

00160

Analysis of reasons of the coronary arteries stent thrombosis in patients with acute coronary syndrome

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BACKGROUND: The aim is to analyze stent thrombosis (ST) in patients with acute coronary syndrome (ACS) and to determine the influence of a combination of different factors responsible for a development of the coronary artery stent thrombosis.
METHODS: According to classification of Academic Research Consortium proposed in 2006 for ST, we have carried out a retrospective analysis of: 404 patients undergone a coronary artery stenting in city clinical hospital №7, Almaty from 15th of September, 2016 till 2017 (during 16 months). The influence of several factors on development of the ST has been analyzed, for what the prognostic model of the proportional risks included such following variables as sex, age, arterial hypertension, diabetes mellitus, smoking, lipid spectrum level, presence of the ACS with ST segment elevation and without it, repeated MI, left ventricular systolic dysfunction - ejection fraction (EF) <50%, vascular diameter, extension of target stenosis, type of stent, revascularization completeness. In addition to the timing of onset of the ST, we evaluated the clinical condition of a patient, urgency of a surgery, character of lesion, initial stenosis percentage, anticoagulant therapy, presence of antiproliferative stent coating.
RESULTS: Retrospective analysis included 726 patients who underwent coronary angiography; these were predominantly patients with "Acute coronary syndrome and chronic course of the ischemic heart disease". Surgeries were performed between 2016 and 2017 years in the multiprofile hospital – city clinical hospital №7 that serves the west part of Almaty city. Among them 466 (64,3%) males and 259 (35,7%) females. The age of patients varied in the range from 35 till 91 years, the average age was 64,3±12,3 years. 675 (93%) patients were admitted with ACS in an urgent need, 51 (7%) patients were admitted with exertional angina pectoris in a planned order. ACS with ST segment elevation was detected in 176 (24,2%) cases. ST was detected in 8 (1,9%) patients who underwent a coronary artery stenting with ACS with ST segment elevation and without it according to angiographic confirmed data, males - 7 (87,5%), female - 1 (12,5%). ST developed in 7 (87,5%) patients with ACS with ST segment elevation and in 1 (12,5%) patient with ACS without ST segment elevation in 12 days after stent implantation.
CONCLUSIONS: The carried out analysis has shown an extremely significant role of double antiaggregant therapy in patients with ACS after coronary artery stenting. The significant factors increasing the risk of stent thrombosis are as follows: presence of ACS in patients, multivascular lesion, decreased EF, initial occlusion of coronary arteries (87,5%), and the basic one is an interruption of the double antiaggregant therapy after endovascular surgery. Combination of masculine gender and age elder than 60 years old, also coronary artery occlusion in presence of decreased EF are the additional predictors of stent thrombosis.

00166

Intramyocardial implantation of bone marrow cells treated with erythropoietin in coronary artery disease surgery (6-month results)

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BACKGROUND: According to a series of studies bone marrow cells (BMC) therapy during ischemic heart disease (IHD) surgery has shown mixed results. BMC preconditioning using different growth factors becomes the promising direction of cell therapy. Experiments with laboratory animals have shown that the erythropoietin using leads to the myocardial ischemia zone restriction and facilitates the neoangiogenesis. The aim of the study is a clinical evaluation of the new indirect revascularization method.
METHODS: We estimated half-yearly results of erythropoietin treated BMC implantation in cases of the distal coronary lesions (40 patients BMC-group). The control group consists of 40 patients with diffuse and distal coronary disease (artery with distal lesion was not shunted). Clinical status, echocardiography, perfusion scintigraphy with Tc99 and I-123-MIBG were evaluated. In addition, the phenotype and functional properties of implanted cells were estimated by the flow cytofluometry.
RESULTS: Follow-up at 6 months after surgery revealed a significant decrease in angina (CCS) in both groups with more pronounced changes in the main group. There was no statistically significant difference between the groups for SF36 and NYHA functional class. Accord-

ing to perfusion scintigraphy with Tc-99, the stable perfusion defect (SPD) before surgery in BMC group was 9.1 [3,5;18,5] %, and до 6,0 [2,5;16,5] % after six months (p = 0.008), SPD in the control group decreased from 8.6[4,3;15,5]% to 8.0[3,6;13,4]%(p = 0.03). There is a moderate improvement of the left ventricle functional parameters, more significant in the main group. Left ventricular ejection fraction (LVEF) increased from 54 [51, 58] to 58 [57, 63] (p=0.041). Myocardial sympathetic activity assessement by 123 I-MIBG-scintigraphy showed a significant decrease of the left ventricle innervation defect 6 months after surgery in the main group 6 months after the operation: from 15.4 [14.2, 16.3]% to 11.7 [9.3, 13.2]% (p = 0.045). In the control group, there was no reliable dynamics. According to the flow cytometry BMC stimulation with erythropoietin increases CD34 + pool of cells at different stages of differentiation, initiates cell retention in the phase of rest and initial growth, decreases the number of cells at the early stage of apoptosis and reduces the proliferative capacity of the cells.
CONCLUSIONS: Preparation of autologous bone marrow cells by erythropoietin treatment improves BMC functional properties. Intramyocardial implantation of BMC treated with erythropoietin improves myocardial perfusion, myocardial sympathetic activity and contractility in the affected area. This work was supported by a Russian Scientific Foundation grant (project number 16-15-00057).

00151

Transapical approach for mitral valve repairing using artificial chords (animal experiments)

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BACKGROUND: Mitral valve repair is a well known procedure when using cardio-pulmonary bypass. Endovascular approach is quite safe, but it is not a reliable procedure. Transapical "NeoChords" approach may incise the mitral valve leaflet and cause a recurrent mitral insufficiency. Our goal was to achieve mitral valve repair by a mini-invasive transapical approach.
METHODS: There are two ways to create artificial chords for the mitral valve by transapical approach. The first method to create artificial chords of mitral valve is rather simple and fast (Fig.1). The second method is more reliable but more complex (Fig 2). The artificial neochords were made of polytetrafluoroethylene (PTFE) threads, which are routinely used as artificial chords in open heart surgery. Suture annuloplasty may be performed with modified non-absorbable synthetic braided threads which are generally used for suture annuloplasty in open heart surgery. The same instruments can be used for suture mitral valve annuloplasty as well.
RESULTS: Twenty experiments with pig's hearts were performed. Transapical artificial PTFE neochords implantation was performed with specially designed instrumental set (feeding device and receiving device). The 1st method of creating artificial chords may be used for the first stage of this procedure and for dense leaflets of the mitral valve. The 2nd method is more reliable for the treatment of prolapsed mitral valve with thinned leaflets. The first method is rather simple and fast, whereas second method of creating artificial mitral chords is more reliable, however being more complex. Total repair of mitral valve insufficiency could be performed by transapical approach using special feeding and receiving devices. Combined ultrasound and X-ray guidance is required for precise puncture of fibrotic ring and prolapsed leaflet of mitral valve.
CONCLUSIONS: The newly developed method of transapical mitral valve repair was successfully tested in isolated hearts. It should be verified in big animal models.
Fig 1. The first method to create artificial mitral valve chords.
Fig 2. The second method to create artificial mitral valve chords.

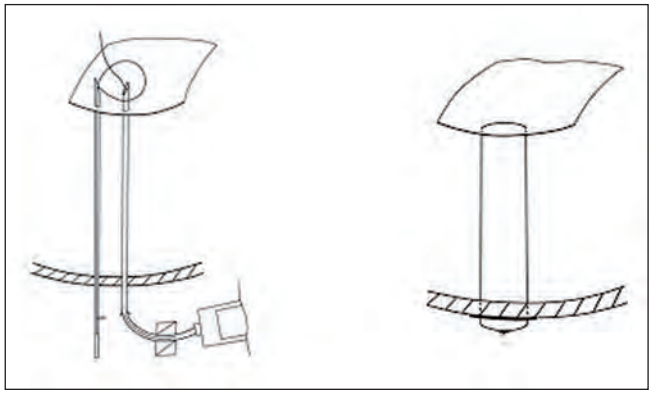

Figure 1.

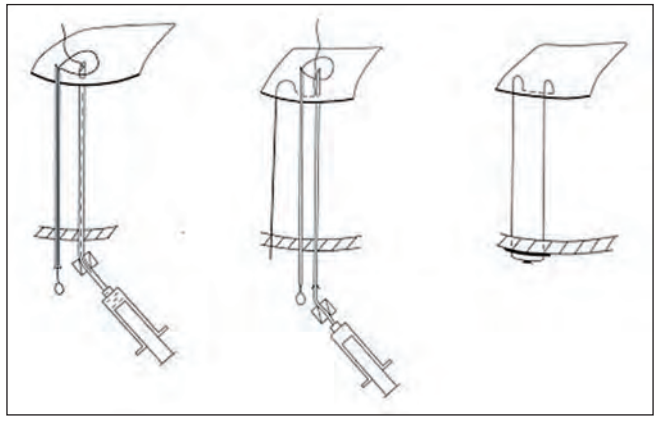

Figure 2.

00216

The remote results after mitral valve replacement

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BACKGROUND: To study the characteristics of a remote period after mitral valve replacement (MVR)
METHODS: In the analyzed group included 569 patients discharged after the MVR at the Institute for the period 2005-2006. This represented 96.7% of discharged on hospital stage. There were men 268 (47.1%) and women 301(52.9%). The age of patients ranged from 29 to 71 years (mean, 53.1 ± 8.5 years). By NYHA classification there were followed-up: II class 49 (8.6%) patients, III class 179 (31.4%) patients and IV class 341 (60.0%) patients.The predominate reason of pathology was rheumatism. Atrial fibrillation was observed in 532 (93.4%) patients. Plasty of LA was perfomed in 57 (10,1%)patients. Maze procedure was occured in 39 (6,9%) patients Concomitant tricuspid malformation was observed in 135 (23.7%) patients. Previous heart surgery (mainly closed mitral commissurotomy) had 129 (21.4%) patients. Concomitant CABG was observed in 93 (5.0%) patients. Only mechanical prostheses were implanted: Saint Jude, Carbomedics, ATS, Edwsrds-Mira, On-X) (482 patients) and mono-leaf (87 patients).
RESULTS: A good result of the operation in the remote period is observed in most cases, the implantation of double-leaf models (except Edwards-Mira - out of production), operated in II-III functional class and in sinus rhythm. Average followed-up at remote period 9.2 ± 0.7 yy At 9 years we had observed: survival rate 69,4%, stability of good results occurred 57.3%, freedom from trombembolic complications were observed in 94.7%, freedom from reoperations was observed in 96.2%. Reoperations were occured: thomboses of mitral prostheses (n=3), prosthetic endocardytis (n=3). A-V blocade was occured in 9 (1.6%) patients. Sinus rhythm was marked in 31 (5.4%) patients. The

main risk factors at the remote period: IV functional class, atrial fibrillation, concominant tricuspid valve diseases, left atriomegaly (diameter of 6.0 cm or more), ejection fraction less than 0.45, high pulmonary hypertension (PSPP > 70 mm.Hg), small cavity of left ventricle (EDV < 70 ml), high pulmonary hypertension, left ventriculomegaly (ESVI > 95 ml/m.q), progressive ischemic heart disease, monodisc prosthesis.
CONCLUSIONS: At the remote period (9.2 ± 0.7 yy) good results of the operation by mechanical mitral prostheses was observed in most cases. Operation should be better performed in II-III functional class and with sinus rhythm. Reduction of the left atrium to the physiological norms, resection of left atrial`s ear are important elements for the restoration of sinus rhythm with concomitant Maze procedure and to reduce the risk of trombembolic complications. A good result of the operation in the remote period is observed in most cases with the implantation of double-leaf models (except Edwards-Mira), operated in II-III functional class and with sinus rhythm.

00261

Comparison of clinical and hemodynamic long-term results of valve repair and replacement in patients with ischemic mitral regurgitation

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BACKGROUND: The surgical strategy to correct ischemic mitral regurgitation (MR) is still controversial. While valve repair has been considered the gold standard in most clinical scenarios, the most recent clinical practice guidelines, based on the latest evidence, recommend valve replacement in this specific clinical scenario. This study was designed to compare early morbidity and mortality (30 days), long-term survival and functional outcome of repair and valve replacement in patients with ischemic MR, associated or not with myocardial revascularization.
METHODS: We conducted a retrospective cohort study in all patients with ischemic MR undergoing valve repair or replacement. From a total of 184 patients with ischemic MR operated on at our center between January 2000 and December 2016, we selected 48 couples with similar preoperative anatomical and clinical characteristics using the propensity score, establishing an R group (repair) and a S group (substitution), according to the surgical strategy used to correct the MR. Both elective patients and those operated on urgent basis were included in the study. The characteristics of surgery, early morbidity and mortality, and clinical and echocardiographic results are analyzed over a 10-year follow-up period.
RESULTS: Ischemic MR surgery implies a high early morbidity and mortality, regardless of the type of intervention performed. Survival at 5 years (62% *versus* 48%) and 10 years (33% *versus* 24%) was slight, although not statistically significant, higher in the R group. Nor did we find differences in the functional situation or in the incidence of complications related to the surgical procedure during the follow-up. However, the recurrence of significant MR was greater in the group R; the percentage of patients free of this circumstance after 5 (93% *versus* 74%) and 10 years (93% *versus* 59%) was significantly higher in group S. Despite this, the need to undergo a new procedure to correct residual MR during follow-up was similar in both groups. The possibility of being free from an unfavourable clinical event (death, significant MR recurrence and reoperation due to this cause) was greater in the S group, both after 5 (56% *versus* 43%) and 10 years (38% *versus* 16%), although these differences were only significant when deaths occurred in the first 30 days were not taken into account.
CONCLUSIONS: We did not find differences in early morbidity and mortality between both groups. However, the recurrence of significant MR and the combined incidence of unfavourable events was greater in patients undergoing valve repair. Our experience, although limited, confirms the recommendations of the latest clinical practice guidelines.

00282

Surgical management of acute Stanford type A aortic dissection: single-center experience before and after implementation of 24/7 emergency cardiac surgery service

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BACKGROUND: Acute Stanford type A aortic dissection is life-threatening condition in cardiac surgery, therefore emergency repair of the thoracic aorta is crucial to improve patient outcome. Aim of the study was to compere preoperative and intraoperative characteristics as well as the results of surgically treated patients with acute Stanford type A aortic dissection before and after implementation of 24/7 emergency cardiac surgery service.
METHODS: Medical data and surgical outcome of 64 patients enrolled in the study were analyzed. Patients were divided in two groups: patients who underwent surgical repair of acute Stanford type A aortic dissection in Pauls Stradins Clinical University hospital in years 2006-2016 (I group), and patients who underwent surgery in year 2017 (II group).
RESULTS: 25.0% of all surgical repairs were performed in year 2017. Mean age of I group was 55.0±13.9 and II group 56.3±13.2 years. 14.6% in I and 12.5% in II group were >70 years old. Majority of patients in both groups were males (72.9% in I and 87.5% in II group). History of arterial hypertension was found in 81.3% in I and 75.0% of patients in II group, furthermore 39.6% in I group and 25.0% in II group had history of grade III arterial hypertension. About a half of the patients in both groups (45.8% in I group, 43.8% in II group) were transferred from other hospitals. Compared to 37.5% patients in I group, 87.5% of patients in II group were surgically treated within 24 hours from onset of symptoms. Majority of patients (70.8%) in I group underwent supracoronary ascending aorta replacement. Hemiarch replacement was performed in 6.3% and total arch replacement - 8.3% of cases. In group II, supracoronary ascending aorta replacement, hemiarch and total arch replacement was performed in 37.5%, 18.8% and 25.0% of all cases. Surgery of aortic root was performed in 12.5% and 18.8% of cases respectively. In I group 25.0% of patients, whom intraoperative hypothermia was used, were cooled to < 20° C and 30.0% to level of moderate hypothermia (20 – 28° C), compared to II group, where 78.6% of patients were cooled to level of moderate hypothermia and none to level of deep hypothermia. Intraoperative mortality and overall intrahospital mortality in I group was 12.5% and 18.8%, compared to II group, where overall intrahospital mortality was 25.0% and none of the patients died intraoperatively. Postoperative complications occurred in 47.9% in I group and 56.3% in II group.
CONCLUSIONS: Implementation of 24/7 emergency cardiac surgery service significantly increased volume of performed repairs per year as well as notably reduced time from onset of symptoms to surgery. Volume increase led to shift of paradigm towards greater extent of surgical repair and use of moderate intraoperative hypothermia as desired cooling level, therefore substantially reducing intraoperative mortality. However, there was no statistically significant difference in intrahospital mortality between groups.

FRIDAY APRIL 13

00385

Epicardial bipolar radiofrequency ablation of pulmonary vein as a preventive strategy for reducing the incidence of postoperative atrial fibrillation in coronary artery disease patients

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BACKGROUND: We sought to evaluate the effectiveness of epicardial bipolar radiofrequency ablation of pulmonary vein in preventing postoperative atrial fibrillation (POAF) in coronary artery disease (CAD) patients undergoing coronary artery bypass graft (CABG) surgery.
METHODS: A single center prospective randomized clinical study, involving 63 CAD patients, was conducted. The study was approved by the local research ethics committee. Written informed consent was obtained from all participants. The patients were eligible for CABG and none of them had a history of atrial fibrillation. The patients were divided into two groups: Group 1 (n=34) received isolated standard CABG; Group 2 (n=29) had CABG with concomitant epicardial bilateral radiofrequency pulmonary vein ablation for the primary prevention of POAF. A routine cardiovascular assessment including echocardiography and coronary angiography was carried out in all the subjects.All the interventions were performed by a single surgical team using standardized anesthesia and perfusion protocols, with a perfusion index of 2,4-2,7 L/m2 at a perfusion rate of 3,84±0,8. All operations were performed through a full median sternotomy.Cardiopulmonary bypass (CPB) was connected by cannulation of the ascending aorta and right atrium with a double-lumen cannula. Bipolar radiofrequency ablation was completed in the setting of parallel CPB with the use of the Isolator Transpolar bipolar electrode clamp at the Atricure Inc. surgical ablation system (USA) until transmurality was achieved. At the stage of CABG a standard procedure was performed using the left internal thoracic artery and the vena saphena magna after thermal blood cardioplegia. There was no occlusion of the left atrial appendage. Statistical processing was carried out using STATISTICS 10. All results are expressed as mean ± standard deviation, among others, Student's t-test for normal distribution and $\chi 2$ for discrete values were used. Differences were considered significant at $p < 0.05$.
RESULTS: There was no in-hospital mortality in either group. Performing radiofrequency ablation was not conducive to longer operating times at any of the main stages of the procedure either in Group 1 or in Group 2.The groups were comparable for the duration of the intervention parameters (266,65 ± 44,9 251,96 ± and 41 min, respectively, p = 0,184) cardiopulmonary bypass time (88,64 ± 19,2 ± 86.55 and 16.9 min, respectively, at p = 0.381), the aorta clamping time (53.38 ± 12.5 and 48.38 ± 8.7 min, with p = 0.386). The groups did not differ in the number of shunts (3.23 ± 0.61 and 3.13 ± 0.51 at p = 0.524).
POAF was observed in 11 (32.4%) patients in the CABG group and 7 (24.1%) patients in the pulmonary vein ablation group. There was no significant difference (p = 0.470). AF in 91% occurred on the 2-3rd day of the postoperative period, not differing between the groups of observations. Patients had no significant differences during the postoperative period. Complications from the operating wound, repeated surgical interventions, perioperative myocardial infarctions and cerebral circulation disorders were also not noted. In each group, there was one case of POAF persisting at the time of discharge from the hospital.
CONCLUSIONS: Adding adjuvant ablation of the pulmonary vein to CABG only slightly complicates the surgical intervention, but does not extend the time of CPB and the operation. There has been a trend found towards a decrease in the incidence of POAF in patients undergoing preventive bipolar RFA of the pulmonary vein, however, further larger studies are required to obtain statistically reliable evidence.

00266

Predictors of survival, aortic valve stability and reoperation after aortic valve-sparing surgery: early and long-term outcomes

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BACKGROUND: Aortic valve-sparing operations represent and alternative to conventional treatment of combined prosthetic valve replacement and ascending aorta for patients affected of aortic root aneurysms with or without aortic valvular insufficiency, commonly detected in young patients with syndromic familial aortopathies. The Yacoub technique and David technique are the two main techniques originally described in aortic valve-sparing surgery. The aim of the study is to determine statistical predictors of survival, reoperation, and early and long term stability of valve function for both types of valve-sparing operation in our institution that may help patient selection and future outcomes.
METHODS: We carried out a retrospective study of a cohort of 80 patients submitted to aortic valve-sparing operations in the Cardiovascular Surgery Service of the University Hospital Marqués de Valdecilla, during a 20 year time. Clinical and echocardiographic follow-up results were analyzed during this two decades of follow up.
RESULTS: Valve reimplantation according to David´s technique was performed in 88% of patients.The series features a total of 637 patient-years of cumulative follow up, with a mean monitoring of 12 ± 5.8 years. In the intraoperative echocardiographic control 56% of patients had no or trivial aortic regurgitation and 14% required conversion to aortic valve replacement. In the echocardiographic control at discharge, 97% had no or minimal aortic regurgitation. Overall actuarial survival was 92% at 5 years, 75% at 10 years and 68% at 15 and 20 years, and only for those where aortic valve was spared a 97% at 5 years and 92% between 10 and 20 years respectively. The average time to onset of significant AR (greater than grade II) was 4.8 ± 3.8 years (mean ± SD). Actuarial curves at 5, 10, 15 and 20 years respectively were analyzed for aortic valve function stability and reoperation. The surgical technique, duration of the operation and the presence of aortic insufficiency at discharge were independent predictors of the occurrence of major cardiac events in the multivariate analysis for the overall series. The smaller diameter vascular graft was as an independent determinant of the need for conversion. In the serie of patients who had a reimplantation technique, preoperative aortic regurgitation was identified as a negative predictor of reparability. Both, intraoperative and discharge aortic regurgitation levels, were identified as independent predictors of long term stability of the repair. Preoperative functional class, degree of aortic regurgitation at moment of discharge and Marfan diagnosis appeared as predictors for aortic valve replacement during follow-up.
CONCLUSIONS: Valve-sparing root replacement surgery, provides acceptable results in the short, medium and, long term follow up in

terms of reoperation and valvular stability. The degree of preoperative severity of aortic regurgitation is a significant negative predictor of reparability that may help in selection of surgical candidates. Intraoperative post-repair regurgitation provides information about the stability of valve function. The echocardiographic study at discharge has a significant negative predictive capacity of valve function during the first postoperative decade. Further studies and longer follow-up are necesaries to define the value and indications of this type of reconstructive surgery.

00263

Aortic valve-sparing root replacement: evolution and sugical outcomes after twenty years follow-up

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BACKGROUND: The surgical techniques of aortic valve-sparing root replacement emerge as an alternative to the standard treatment of combined prosthetic replacement of valve and ascending aorta for those patients with aortic root aneurysms with or without aortic valvular insufficiency. Avoiding the use of valve prostheses and the associated permanent anticoagulant therapy is a advantage that also needs to deal with de handicap of a more complex surgical technique. There are two main techniques of aortic valve-sparing operations: the remodeling of the aortic root or Yacoub technique, and the aortic valve reimplantation or David technique. Both have proven acceptable short and long-term results. We perform retrospective analysis of a cohort of patients operated during a 20 year time frame and in whom a valve sparing aortic root replacement was performed. Results concerning mortality, major cardiovascular adverse events or valve failure, after a valve sparing operation in the long follow up are analyzed.
METHODS: A serie of 80 patients referred for aortic valve-sparing operations to the Cardiovascular Surgery Service of the University Hospital Marqués de Valdecilla, between 1994 and 2015. This is a retrospective analysis of data collected during annual clinical and echocardiographic follow-up visits of the patients.
RESULTS: A total 637 patient-years of cumulative follow up, with a mean monitoring of 12 ± 5.8 years. Follow-up was 100% complete. Male patients accounted for 79% of the cohort, 10% had a diagnosis of Marfan syndrome, 10% had bicuspid aortic valves and 10% a chronic aortic dissection type A. Prior to surgery, 53% of patients were in functional class I and 59% had a grade III and IV preoperative aortic insufficiency. Valve reimplantation according to David´s technique was performed in 88% of patients. In 20% of cases, a leaflet repair was required and 20% had other associated techniques. In the intraoperative echocardiographic control 56% of patients had no or trivial aortic regurgitation and 14% required conversion to aortic valve replacement. Major postoperative complications included reexploration for bleeding in 14%, AV block in 13%, mediastinitis in 1.2% and no thromboembolic events. In the echocardiographic control at discharge, 97% had no or minimal aortic regurgitation. Hospital mortality was 5.0% and late mortality 13.7%. The surgical technique, duration of the operation and the presence of aortic insufficiency at discharge were independent predictors of the occurrence of major cardiac events in the multivariate analysis for the overall series. This analysis did not found significant determinants of overall mortality.
CONCLUSIONS: Valve-sparing root replacement surgery, despite its complexity, provides acceptable results in the long follow up in terms of survival and major cardiac complications. The technique is particularly advantageous for young or middle-aged patients in terms of thrombogenicity and risk of major complications. Further studies with more numerous patient cohorts and longer follow-up are warranted to define more clearly the value and indications of this type of reconstructive surgery.

00332

MICS reduces morbidity in high-risk patients undergoing cardiac surgery

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BACKGROUND: Minimally invasive cardiac surgery (MICS) has grown in popularity over the last 2 decades and is now established as a standard of practice. With increasing expertise, MICS is now being used to treat high-risk patients undergoing adult cardiac surgery. Concerns over reduced exposure and long operative times have been a hindrance for the wider acceptance of MICS. Here we present a small case series of 4 high-risk patients who underwent cardiac surgery through minimally invasive approach with a good outcome.
CASE REPORT:
Case 1: A 36-year-old man with coronary artery disease and poor left ventricular function following recent myocardial infarction (LVEF 30%) underwent Minimally Invasive, Port Access CABG. He had an uneventful postoperative period with no ionotropic or transfusion requirements. He was comfortable and was discharged home on 2nd post operative day.
Case 2: A 66-year-old male with multiple myeloma under remission presented with significant coronary artery disease involving the left main stem with moderate LV dysfunction and renal impairment. In view of his underlying comorbidities, he was offered Minimally Invasive hybrid revascularization. He underwent Minimally Invasive CABG with LIMA to LAD graft. On post-operative day 1, he was loaded with antiplatelets and taken-up for percutaneous coronary intervention(PCI) with drug-eluting stent (DES) to left circumflex artery and obtuse marginal artery. He had an uneventful postoperative period and discharged home on the 4th postoperative day. On the first follow-up after two weeks, patient was asymptomatic with return to day to day activities and well-healed scar.
Case 3: A 49-year-old male with severe rheumatic mitral stenosis who had undergone previous open mitral valvotomy presented now with increasing shortness of breath. On evaluation, he was found to have severe calcific mitral stenosis. He underwent mitral valve replacement with a mechanical valve through minimally invasive port access procedure. He made an uneventful recovery with no blood transfusion and was discharged home on 4th post-operative day.
Case 4: A 65-year-old male, who underwent previous CABG with moderate Left Ventricular dysfunction presented with severe chest pain radiating to the back. On evaluation, he was found to have 3 aneurysms involving the aortic arch, descending aorta and bifurcation of aorta including the iliac vessels, respectively. His previous CABG grafts were found to be patent. Following a multidisciplinary discussion involving the cardiologist, interventional radiologist, anaesthesiologist and cardiac surgeons, a hybrid approach was planned. Redo sternotomy and debranching of aortic arch vessels was performed, followed by Thoracic Endovascular Aortic Repair (TEVAR) on the first post-op day. He developed paraparesis of the left upper limb from which he made a complete recovery within 48 hours. He recovered well and was discharged home on 8th post operative day. On 18 months follow-up, with CT scan, he continues to do well with no symptoms and no evidence of aneurysm progression or endoleak.
CONCLUSIONS: With increase in expertise, better instrumentation and multidisciplinary approach, high-risk adult cardiac surgery procedures can be performed with better outcome than conventional surgery in selected patients.

00319

Sutureless surgical aortic valve replacement (SU-AVR) in the era of TAVR

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BACKGROUND: Aortic valve Stenosis (AS) is the most common valvular disease in the elderly and while most of the patients remain

asymptomatic for decades, when they develop symptoms the prognosis is poor with an estimated mortality of 50% in two years without surgical treatment. Aortic Valve Replacement (AVR) represents the gold standard for the treatment of patients affected by AS. The aim of this study is to present the use of SU-AVR as an important alternative in a time where Transcatheter Aortic Valve Replacement (TAVR) has profoundly altered the landscape of cardiovascular medicine, as well as to identify the patients that would benefit from the use of SU-AVR.
METHODS: Articles from 2012 to 2017 were identified using PubMed, involving patients with AS that were treated with either SU-AVR or TAVR.
Key words including SU-AVR, AS, TAVR were used.
RESULTS: SU-AVR has recently been validated as a safe and efficient therapeutic solution for low- to intermediate-risk patients with AS. Hence, prostheses' hemodynamic performance and patients' clinical outcomes are of great importance in order to select the ideal device for the "gray zone" patient. Therefore, the role of a Heart Team seems to be of utmost importance. The significantly lower rate of postoperative paravalvular leak (PVL) following SU-AVR compared to TAVR appears to be a predictor of mortality. On the other hand, TAVR seems to perform better in terms of transvalvular mean and peak gradients. SU-AVR presents a lower rate of postoperative complications which results in reduced resource consumption in the sutureless group over TAVR for diagnostics, operating room, and hospital stay, with a total cost saving of approximately 25%. Therefore, SU-AVR and TAVR are both reliable options in patients with severe aortic valve stenosis as an alternative to conventional surgery, and the choice of the best device should be tailored to the patient's anatomical and surgical characteristics
CONCLUSIONS: TAVR has become a safe and effective therapy for patients with aortic stenosis, with early results comparable to surgery in patients with severe AS and intermediate operative risk. Nevertheless, excellent short-term outcomes and lower postoperative complication rate can be achieved with sutureless valves. In addition, they may be a good option for small aortic root. A minimally invasive approach seems to improve outcomes in elderly, obese and frail patients. Furthermore, the shorter surgical time plays a crucial role in high risk patients. However, longer term follow-up is necessary to further evaluate the durability and the benefits of these valves.

00070

Minimally invasive cardiac surgery *versus* conventional median sternotomy for atrial septal defect closure: comparison of postoperative datas

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BACKGROUND: Atrial septal defects (ASD) especially secundum ASD is one of the most common form of congenital heart disease. Median sternotomy is the standard approach for atrial septal defect (ASD) closure. In this study we compared clinical outcomes of adult patients undergoing ASD repair via minimally invasive approach *versus* "gold standard" median sternotomy (MS).
METHODS: A total of 44 patients over 14 years old underwent ASD closure at our clinic by a single surgical team from 2012 to 2017. Fourty four patients with isolated ASD closure were retrospectively analyzed. We compared postoperative datas of patients undergoing ASD repair via minimally invasive approach *versus* "gold Standard" sternotomy.
RESULTS: There were no significant differences in morbidities and mortalities between two groups. Postoperative transfusion (393,6±519,4 ml vs. 120,3±245,8 ml, p: 0,138) was also not significantly different. Mechanical ventilation time (10,6±2,2 hours vs. 7,0±1,7 hours , p : 0,000) , intensive care unit length of stay (2,3±0,5 days vs. 1,4±0,5 days , p : 0,000) , and hospital length of stay (6,3±1,1 days vs. 3,7±0,5 days p : 0,000) were shorter in the MICS-RAT group and these differences were statistically significant. Chest tube drainage (484,5±270,0 ml vs. 218,7±92,6 ml, p: 0,000) was significantly different.
CONCLUSIONS: The results demonstrated similar morbidity and mortality between groups, and favored MICS-RAT in bleedings, hospital and ICU length of stay. MICS-RAT should be kept in mind as a good alternative to sternotomy both cost reduction and patient comfort.

00076

Predictors of neurologic complications after type A acute aortic dissection operations

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BACKGROUND: Neurologic complications are commonly seen in patients with type A acute aortic dissections by nature of disease. These complications can be seen after surgery, as well. This study deals with the predictors of neurologic complications after type A acute aortic dissection operations.
METHODS: Hospital records were used to retrospectively evaluate preoperative and postoperative clinical parameters. Age, sex, comorbid factors, redo cardiac surgery, ascending aorta diameter at admission, body surface area, euroSCORE scores, hemoglobin, white blood cell count, preoperative malperfusion signs, and ejection fraction were recorded as preoperative parameters. History of coronary ischemia, extremity ischemia, cerebrovascular event, acute renal failure, and ileus signs were accepted as organ malperfusion. Operation duration, duration of cardiopulmonary bypass (CPB), duration of cross-clamping (CC), intervention to aortic root or aortic arch were evaluated as operative parameters. Postoperative parameters included especially mortality and neurological complications in addition to other parameters such as weaning duration, length of stay in intensive care unit, length of hospitalization, development of renal failure, use of blood products, and revision surgery for bleeding. Contrasted thoracoabdominal computerized tomography (CT) and echocardiography were performed preoperatively in all patients. Patients were operated urgently. All operations were performed by three different teams, who had similar surgical ability and experience, with the same surgical technician. All operations were performed by three different teams, who had similar surgical ability and experience, with the same surgical technician.
RESULTS: In univariate analysis, operation time, cross-clamp time, postoperative bleeding, preoperative loss of consciousness, revision surgery for postoperative bleeding, acute renal failure requiring dialysis, prolonged intubation were statistically significant for predicting postoperative neurologic complications ($p<0,05$). In multivariate analysis, cross-clamp time, postoperative bleeding, preoperative loss of consciousness were statistically significant for predicting postoperative neurologic complications ($p<0.05$).
CONCLUSIONS: There are many predictors of postoperative neurologic complications regarding type 1 acute aortic dissections. Surgical team should move with caution to cope with these predictors.

00308

An emergent surgery for valve migration in transcatheter aortic valve replacement

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BACKGROUND: Transcatheter aortic valve replacement is a common treatment method for patients with severe aortic stenosis, who are either at high-risk or non-eligible for surgery. One of the rare, but major

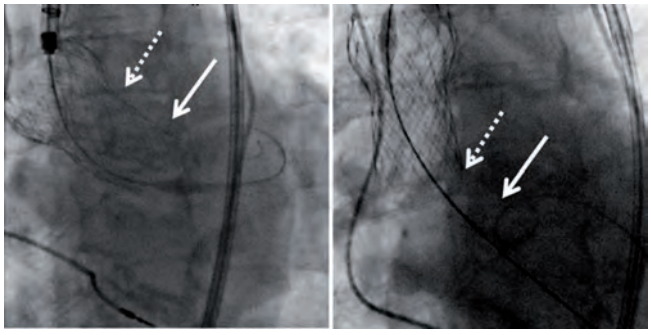

Figure 1.

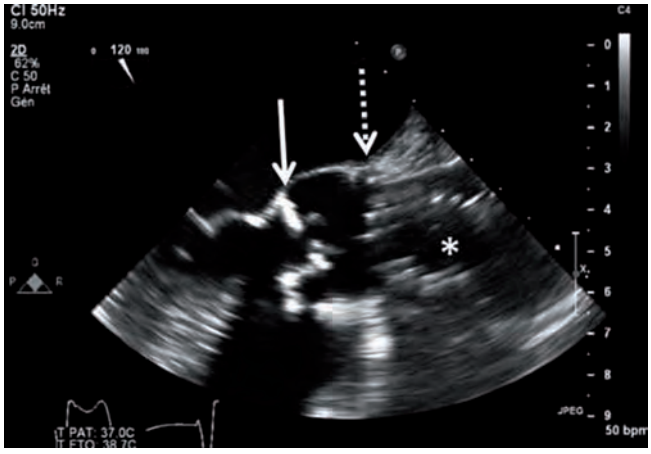

Figure 2.

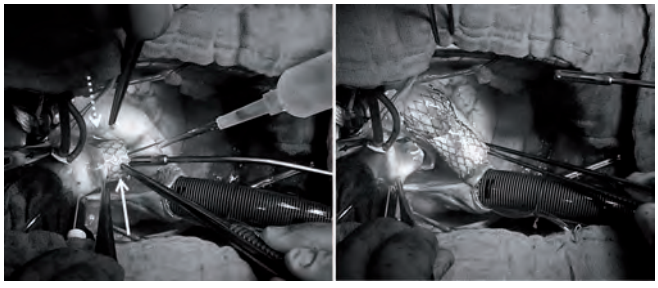

Figure 3.

complications of this method is valve migration, which usually occurs during the intervention. The assessment of the Heart Team before transcatheter aortic valve replacement is determinant for the "to-do list" for the bail-out procedure. Discussion of the possible major complications and interventional plans may save the patient's life in case of life-threatening transcatheter aortic valve replacement complications. Herein, we report a successful surgical management of valve migration occurred during transcatheter aortic valve replacement in a low-risk patient with bicuspid aortic valve.

CASE REPORTS: An 81-year-old female patient was admitted with symptoms of exertional shortness of breath and angina. Coronary angiography showed normal findings. Transthoracic echocardiography revealed severely stenotic BAV with moderate calcifications and dilated ascending aorta of 42 mm in size. The patient was discussed in the Heart Team. Surgical aortic valve replacement was recommended by the surgical team, with 2.87% logistic EuroSCORE II. However, due to her advanced age, TAVR was chosen based on the patient's will and debates among the cardiologist and anesthesiologist. Elective TAVR with Medtronic-CoreValve ® - Evolut-3R-26 system (Medtronic Inc. Minneapolis, Minnesota, USA) was performed in the catheterization laboratory under local anesthesia. In the final step, the CoreValve ® prosthesis migrated to the ascending aorta (Figure 1, 2). As a result, an ECS was performed to retrieve the migrated prosthesis. Through median sternotomy, cardiopulmonary bypass was instituted with aortic cannulation at the aortic arch level to avoid the CoreValve ® struts. The prosthesis was removed after filling the aortotomy site with cold saline to soften the rigid nitinol struts (Figure 3). Following complete resection of BAV and annular calcifications, a Carpentier-Edwards- Perimount-Magna-Ease-21 bioprosthesis (Edwards Lifesciences, Irwine, CA, USA) was implanted. Superior hemi-sternotomy was initially planned for the patient, if the decision of the Heart Team would go for SAVR. However, full-sternotomy was performed, due to ECS, and to provide full access the extraction of the prosthesis. The postoperative course was uneventful, and the patient was discharged postoperative 16th day.

00075

Predictors of early mortality in emergency surgery for type A acute aortic dissection

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BACKGROUND: Type A acute aortic dissection is a catastrophic pathology even intervened surgically. In this study we evaluated predictors of early mortality in patients undergoing emergency surgery for type A acute aortic dissection.

METHODS: Data were collected from the medical records department and evaluated retrospectively. Predictors of early mortality were seeked. Hospital records were used to retrospectively evaluate preoperative and postoperative clinical parameters.Age, sex, comorbid factors, redo cardiac surgery, ascending aorta diameter at admission, body surface area, euroSCORE scores, hemoglobin, white blood cell count, preoperative malperfusion signs, and ejection fraction were recorded as preoperative parameters. History of coronary ischemia, extremity ischemia, cerebrovascular event, acute renal failure, and ileus signs were accepted as organ malperfusion. Operation duration, duration of cardiopulmonary bypass (CPB), duration of cross-clamping (CC), intervention to aortic root or aortic arch were evaluated as operative parameters. Postoperative parameters included especially mortality and neurological complications in addition to other parameters such as weaning duration, length of stay in intensive care unit, length of hospitalization, development of renal failure, use of blood products, and revision surgery for bleeding. Statistical method: Data were presented as mean, standard deviation, median, minimum, maximum, frequency, and percentage. The distribution of the variables was evaluated with Kolmogorov-Smirnov test. To analyze continuous variables, we used independent samples t-test or Mann-Whitney U test and to analyze categorical variables, we used chi-square test or Fischer's exact test. Univariate and multivariate logistic regression was used to analyze the impact of parameters on postoperative outcomes. A p value less than 0.05 was considered to be statistically significant. We used IBM SPSS 22.0 for statistical analyses.

RESULTS: In univariate analysis, cross-clamp time, postoperative bleeding, loss of consciousness, revision surgery for postoperative bleeding, acute renal failure requiring dialysis, prolonged intubation and neurologic complications were statistically significant for predicting early mortality ($p<0,05$). In multivariate analysis, only neurologic complications were statistically significant for predicting early mortality ($p<0.000$).

CONCLUSIONS: Even though there are many factors can be used to predict early mortality in emergency surgery for type A acute aortic dissection, most reliable of them are neurologic complications seen in early postoperative period.

00072

Is there any difference between preoperative variables of patients with type 1 acute aortic dissection operated on day time working hours or night shifts/weekend shifts?

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BACKGROUND: Patients with type 1 acute aortic dissection are emergently operated on day time working hours or night shifts/weekend shifts. In this study we asked if there is any difference between preoperative variables of patients with type 1 acute aortic dissection operated on day time working hours or night shifts/weekend shifts.
METHODS: 94 patients who underwent emergency surgery for type 1 acute aortic dissection with the same surgical team were retrospectively.evaluated in terms of preoperative variables. Patients were divided into two groups: surgery on day time working hours (n:35) and surgery on night shifts or weekend shifts (n:59) respectively. Age, sex, comorbid factors, redo cardiac surgery, ascending aorta diameter at admission, body surface area, euroSCORE scores, hemoglobin, white blood cell count, preoperative malperfusion signs, and ejection fraction were recorded as preoperative parameters. History of coronary ischemia, extremity ischemia, cerebrovascular event, acute renal failure, and ileus signs were accepted as organ malperfusion. All operations were performed by three different teams, who had similar surgical ability and experience, with the same surgical technician. Respirator dependency for more than 24 hours postoperatively was regarded as prolonged intubation. Patients who were operated in elective conditions due to subacute or chronic type A aortic dissection were excluded from the study.
RESULTS: Organ malperfusion rate was significantly higher in patients operated out of work hours compared to those operated in normal work hours (p=0,04). In patients with organ malperfusion, loss of consciousness rate in patients operated out of work hours was significantly higher than that in patients operated in normal work hours (p=0.004). In addition, number of patients in shock preoperatively was higher in the out of work hours group (p=0,034). Preoperative ascending aorta diameter was the only parameter that was higher in patients operated in work hours (p=0,008). Other preoperative parameters were similar in both groups.
CONCLUSIONS: Among complications of type 1 acute aortic dissection; organ malperfusion, shock and loss of consciousness are more in patients undergoing emergency surgery on night shift or weekend shift.

00234

Infective endocarditis associated with spondiylodiscitis: our expiriance in 3 cases

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BACKGROUND: Infective endocarditis associated with a high of risk of complications such as systemic and cerebral emboli, glomerulonephritis, splenic infarction and rheumatologic manifestations. Spondylodiscitis, however, is rarely observed. It is association with infective endocarditis in about 4% of that patients.
METHODS: Case 1- A 48- year old man was hospitalized with low back pain and fever. Ten days before, patient had a urinary infection. During hospitalization, after magnetic resonance was done, discitis was revealed. Ten days delay diagnosis of infective endocarditis was established according to the Duke criteria. An echocardiography revealed vegetations on septal cuspis of tricuspid valve. Blood cultures were obtained grew out Staphylococcus Aureus. Antimicrobial therapy was initiated according the results of blood culture, 4 weeks. Case 2- A 78-old man was admitted to hospital because he had high tepmerature and low back pain. He had severe urinary infection. After Magnetic resonance was done, discitis was revealed on two places. Case 3 A 54-year old man was admited with high temperature and low back pain. Transesophageal echocardiography confirmed endocarditis of mitral valve. After magnetic resonance was done, discitis was revealed on two places. Blood cultures were obtained grew out Staphylococcus aureus. The patient was treated with three antibiotics intravenous six weeks.
RESULTS: First and second patient, after 4 weeks antibiotics therapy, were operated on. In fist patient we removed the vegetations with partial excision of septal cuspius and performed anuloplastic of tricuspid valve. In second patient, we replaced the aortic valve with aotic biological valve. Intraoperative we found vegetations on right cuspis and perforation of the left. On the same way we continued antibiotics therapy next 4 weeks.
CONCLUSIONS: Infective endocarditis should be included in differentia diagnosis in patients with spondylodiscitis and risk factors for endocarditis. In such patients, echocardiography should be performed routinely.

00086

Is there any advantage of initiating cardiopulmonary bypass before sternotomy in redo cardiac surgery?

I. Peker [1], O. Gokalp [2], Y. Besir [2], L. Yilik [2], H. Iner [3], N. Yesilkaya [4], S. Iscan [5], A. Gürbüz [2]

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BACKGROUND: As cardiac surgery has been performed since a long time ago, redo cases are more commonly seen nowadays. In redocardiac surgery, sternotomy is a tough issue regarding adherent tissues under sternum. In this study we asked if there was any advantage of initiating cardiopulmonary bypass before sternotomy in redocardiac surgery.
METHODS: 114 patients who underwent redocardiac surgery were divided into two groups: patients with femoral cannulation and patients with Standard sternotomy, respectively. Data were retrospectively evaluated. Ethics Committee approval was obtained for the study. The cases consist of patients who under went more than one open heart surgery. The patients were divided into two groups as Group 1 consisted of the patients used CBP before sternotomy and Group 2 included patients not used CBP before sternotomy. Demographic, preoperative, peroperative and postoperative data were recorded in both groups. Patients were compared in terms of these parameters. Patients with multiple cardiac surgeries and standard aorta-unicaval, aorta-bicaval and femoral artery cannulation performed were included in the study and patients with axillary or subclavian artery and jugular vein cannulation performed and patients undergoing off-pump surgery were excluded. Patients' anamnesis, medical histories, peroperative anesthesia follow-up data, cardiopulmonary bypass machine data, postoperative intensive care unit follow-up data were interpreted
RESULTS: Two groups were compared using postoperative data from intensive care unit follow up and service follow up. There was no statistically significant difference between groups in terms of intraaortic balon pump need, early mortality and postoperative neurologic complications (p>0,05). Nevertheless, postoperative bleeding in 24 hours after surgery, weaning period, intensive care unit stay, hospital stay, revision for postoperative bleeding, blood transfusion, use of inotropic agents and postoperative acute renal failure were statictically significantly higher in group 1 (p<0,05)
CONCLUSIONS: Cardiopulmonary bypass via femoral cannula before sternotomy may cause negative results in spite of some advantages. It is a strategy that should be kept in mind in redo cardiac surgery, but surgeon should also be ready to cope with it's negative reflections after surgery.

00085

Comparison of perioperative variables of patients undergoing redo cardiac surgery with or without femoral cannulation before sternotomy

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BACKGROUND: Femoral cannulation before sternotomy is a common strategy used in redo cardiac surgery. Decompression of heart lowers the risk of cardiac injury during sternotomy. Furthermore, cardiopulmonary bypass via femoral cannula allows surgeon work safely in case of cardiac injury. In this study, perioperative variables of patients who underwent cardiopulmonary bypass via femoral cannula before sternotomy and patients who underwent Standard sternotomy were compared.
METHODS: This study was planned with the aim of comparing the effect of using CPB before sternotomy in terms of safety according to not used cases in patients who had previously under went open heart surgery between 1990-2016 and who had underwent re-do open heart surgery. A total of 114 patients in the study were retrospectively analyzed. Patients' data was obtained from the hospital registry system. Ethics Committee approval was obtained for the study.The cases consist of patients who under went more than one open heart surgery. The patients were divided into two groups as Group 1 consisted of the patients used CBP before sternotomy and Group 2 included patients not used CBP before sternotomy. Patients with multiple cardiac surgeries and standard aorta-unicaval, aorta-bicaval and femoral artery cannulation performed were included in the study and patients with axillary or subclavian artery and jugular vein cannulation performed and patients undergoing off-pump surgery were excluded. Patients' anamnesis, medical histories, peroperative anesthesia follow-updata, cardiopulmonary bypass machine data, postoperative intensive care unit follow-up data were interpreted.
RESULTS: There was no statistically significant difference between two groups in terms of cardiopulmonary bypass time, crossclamp time, operation time and cardiac injury during sternotomy (p>0,05). There was no difference between the two groups in terms of first open cardiac surgery (p> 0.05). There was also no difference between the groups in terms of the time interval between the first operation and the second operation.
CONCLUSIONS: Cardiopulmonary bypass via femoral cannula before sternotomy has no advantage in terms of perioperative variables.

00105

Endovascular treatment in hybrid operating room conditions in a patient with iliac artery stenosis and superficial femoral artery occlusion: a case report

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BACKGROUND: Today, ECMO is a life saving extracorporeal perfusion technique. Practicality and ease of use of this technique has lead to increased numbers of ECMO each year. Nevertheless, there are some problems and risks for ECMO use, such as cannulation complications, postoperative bleeding and extremity ischemia. We frequently use ECMO perfusion in patients with post-cardiotomy failure but we don't have adequate experience for acute cardiac failure and hepatic failure patients. In this case we present a patient who was admitted to intensive care unit with acute cardiac failure due to acute myocarditis and we would like to present this ECMO case with ultrasound guided cannulation.
CASE REPORT: 22 year-old male patient was consulted to our clinic due to his rapidly deteriorating hemodynamic state. He had fulminant myocarditis accompanied with fulminant hepatitis. Echocardiography revealed 10% LV EF, advanced tricuspid regurgitation, 47 mm right ventricle diameter and 45 mmHg pulmonary arterial pressure. Tricuspid annular plane systolic excursion was 7. Laboratory parameters showed acute hepatitis (INR: 6.5, aspartate aminotransferase 4200, alanine aminotransferase 2966, total bilirubin 6, platelet count 53000 and d-dimer 11800). We decided to place the patient on ECMO perfusion for acute cardiac failure and acute hepatitis. Arterial blood pressure was 100/80 mmHg but the patient showed extreme peripheral arterial constriction findings due to high doses of noradrenaline, dopamine and dobutamine infusions. We implanted percutaneous veno-arterial ECMO (Figure 2) via right femoral arterial and left femoral venous route with the guidance of ultrasound imaging using Seldinger technique. We also placed and extra 8F arterial catheter caudally ensuring right lower extremity perfusion and this catheter was connected to a side line directly to the oxygenator with a ¼ tubing (Figure 1) which provide oxygenated blood parallel to arterial ECMO line. Hemodynamic parameters of the patient were recovered in the following hours. We had a control echocardiography imaging 6 hours later of ECMO implantation. Echocardiography showed that decreased pulmonary arterial pressure and tricuspid regurgitation (30 mmHg pulmonary pressure and moderate

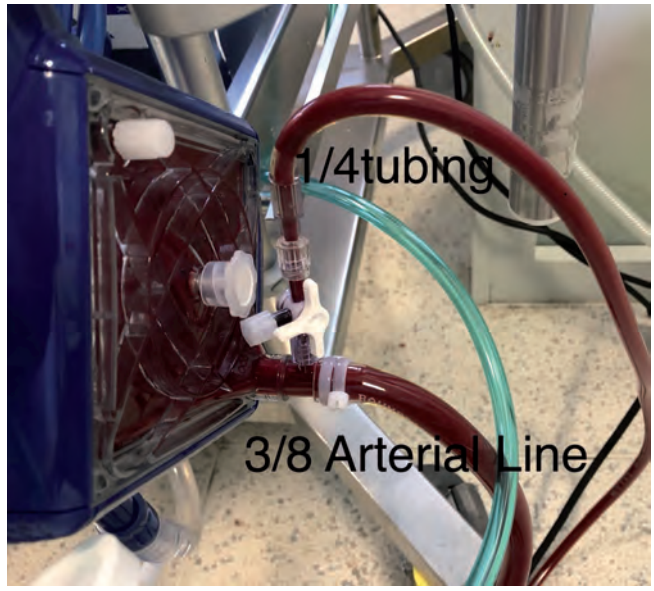

Figure 1.

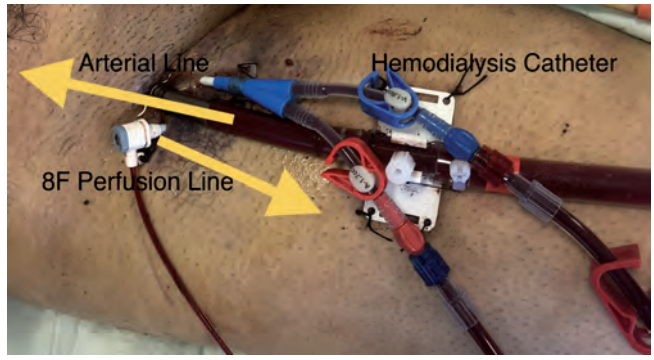

Figure 2.

tricuspid regurgitation). We continued ECMO perfusion 6 days and we successfully weaned the patient from ECMO. ECMO perfusion decreased mortality in postcardiotomy failure patients after cardiac surgery. But, ECMO application for non-surgical indications, like acute cardiac failure due to myocarditis or pulmonary diseases, may show more satisfactory results in short time period. It would be a challenge to cannulate arterial structures in patients with extreme peripheral arterial constriction due to high positive inotropic treatment. Ultrasound imaging is always the best technique to achieve cannulation with minimal or no complication. Arterial lines placed caudally should become a standard procedure for femoral arterial cannulation in ECMO practice to avoid lower extremity ischemia.

00140

A meta-analysis of residual pulmonary hypertension outcomes in patients undergoing pulmonary endarterectomy

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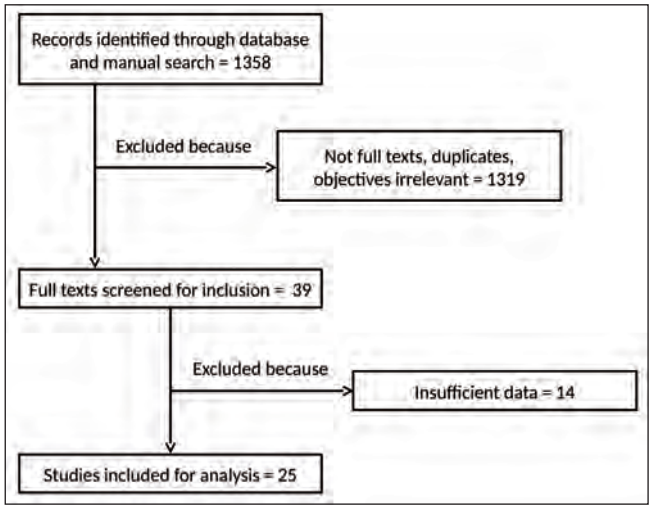
BACKGROUND: Chronic thromboembolic pulmonary hypertension (CTEPH) is surgically treated through pulmonary andarterectomy (PEA). Although PEA is the treatment of choice in terms of both survival and functional outcome, a large number of patients experience persistent pulmonary hypertension after PEA. Using meta-analysis models, this study is aimed of study is to calculate the pooled estimates of outcomes after PEA, including persistent PH.
METHODS: Meta-analysis was conducted on published studies reporting residual/persistent/recurrent pulmonary hypertension in CTEPH patients after PEA. Rate of persistent PH and change in mean pulmonary artery pressure (mPAP), pulmonary vascular resistance (PVR) and 6-minute walk distance (6MWD) after PEA were outcomes of interest.
RESULTS: Twenty five percent of the CTEPH patients were diagnosed with persistent PH after PEA. The pooled average reduction of mPAP was ~21 mmHg (from 47 mmHg at pre-surgery to 26 mmHg after surgery), and PVR after PEA was 561 dynes-sec-cm-5 (from 883 dynes-sec-cm-5 at pre-surgery to 309 dynes-sec-cm-5 after surgery). The pooled average increase in 6MWD was 96 meters (from 337 m at pre-surgery to 433 after surgery).



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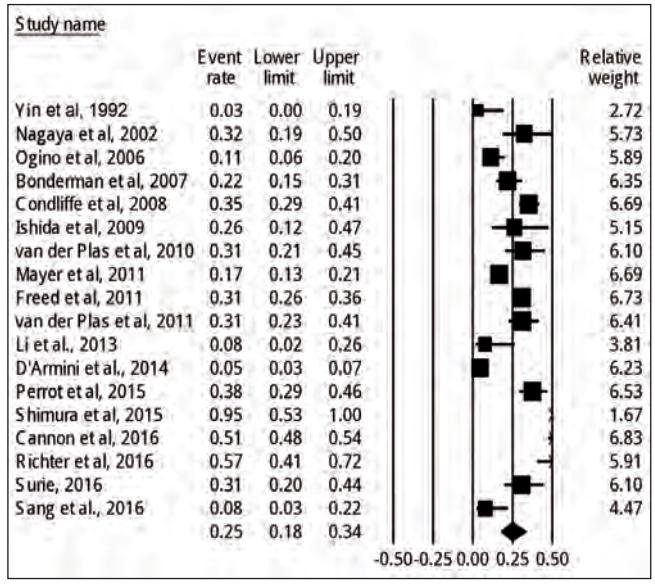

Figure 2.

CONCLUSIONS: PEA is the gold standard in treatment for CTEPH and provides immediate correction of hemodynamic parameters in most patients. However, in up to a quarter of operable cases, pulmonary hypertension persists after surgery. In those patients with persistence PH, continued medical management is required.

00296

Gingivitis in various degenerative cardio-surgical diseases

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BACKGROUND: The main surgical degenerative cardiovascular diseases are coronary bypass surgery, aortic valve stenosis surgery and both when both surgeries are necessary. And this is because surgical degenerative cardiovascular disease has the same etiological factors (diabetes, smoking, inadequate diet, high blood pressure, sedentary lifestyle, hypercholesterolemia, obesity). The prevalence of gingivitis is around 45% when periodontitis is present. Gingivitis is frequently associated with the surgical degenerative cardiovascular diseases maybe because they share a lot of the etiological factors. Some authors believe that this may be the cause of surgical degenerative cardiovascular disease due to bacterial spread of dental plaque and gingival mucosa. Degenerative heart disease being, in its different variants, a consequence of periodontitis and subsequent gingivitis, which could begin in childhood or in early periods of adulthood. Our aim is to compare the presence of gingivitis in patients undergoing different degenerative heart disease.
METHODS: In a university hospital, from January first to december 31, on 2016, 233 interventions were carried out in surgical degenerative cardiovascular disease: 96 coronary by-pass surgery (group A), valvular aortic stenosis surgery in 99 (group B), and on 38 with both surgery (group C). To study the severity of gingivitis we use the Periodontal Screening and Recording (PSR) system established by the American Academy of Periodontics (AAP) and the American Dental Association (ADA). It is done by dividing the buccal cavity in sextants and the largest scale of each sextant is recorded. The PSR scale ranges from PSR0 to PSR4 as the injuries worsen. The informed consent was explained and signed by the patient. The hospital ethics committee was informed. Continuous variables are expressed as mean value ± SD. Comparisons between continuous variables were performed using a two-tailed un-

paired Student t-test. Dichotomous variables were compared using contingency table and chi-square analysis. A p value of < 0.05 was taken as statistically significant. The statistical study was done using SPSS 18 system.
RESULTS: There were no significant differences in the presence of some risk comorbidities (diabetes, renal failure, pulmonary pathology, neurological deficits and arterial hypertension) among groups. There is a higher percentage of sextants with EPB4 code in group C (55.26%) than in groups A (33.33%, p <0.05) and B (42.42%, p <0.05). They are also those who presented the highest number of sextants who need complex periodontal treatment (EPB3 and EPB4, 27.9%) and have the highest percentage of edentulous sextants.
CONCLUSIONS: Patients with isolated coronary surgery are those who had less severe gingival lesions. On the other hand, the patients with mixed coronary-valvular surgery were those who had the most severe.

00277

Periodontitis in degenerative and non-degenerative cardiosurgical pathology

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BACKGROUND: Surgical degenerative cardiovascular disease has the same ethiologic factors than periodontitis (smoking, diabetes, blood hypertension, inadequate diet, obesity, sedentary lifestyle, hypercholesterolemia). The prevalence of periodontitis on adult population is about 90%. When it progresses getting worse it becomes gingivitis. The prevalence of gingivitis is around 45% when periodontitis is present. Gingivitis is frequently associated with this disease and some authors believe that this may be the cause of surgical degenerative cardiovascular disease due to bacterial spread of dental plaque and gingival mucosa. Surgical degenerative cardiovascular disease has the same ethiologic factors than periodontitis (smoking, diabetes, blood hypertension, inadequate diet, obesity, sedentary lifestyle, hypercholesterolemia). Our objective is to compare the presence of periodontitis and gingivitis in patients undergoing degenerative heart disease compared to those who undergo non-degenerative heart disease.
METHODS: From January first to december 31, on 2016, at an University Hospital, 42 patients (group I) with non-degenerative cardiosurgical pathology (13 myxomatosis chronic mitral insufficiencies, 3 interatrial communications, 8 chronic aortic insufficiencies, 7 non-arteriosclerotic aortic aneurysms, and 11 acute aortic dissections) and 233 patients (group II) with degenerative cardio-surgical disease (coronary and / or aortic valvular stenosis). To study the severity of gingivitis we use the index of Loe and Silness reduced (IG-r), which was used to assess the degree of gingivitis. The informed consent was explained and signed by the patient. The hospital ethics committee was informed. Continuous variables are expressed as mean value ± SD. Comparisons between continuous variables were performed using a two-tailed unpaired Student ttest. Dichotomous variables were compared using contingency table and chi-square analysis. A p value of < 0.05 was taken as statistically significant. The statistical study was done using SPSS 18 system.
RESULTS: There were no significant differences in the presence of some comorbidities (renal failure, pulmonary pathology, neurological deficits and arterial hypertension) between groups I and II, except in the incidence of diabetes and peripheral vascular pathology (significantly higher in degenerative cardio-surgical disease). Periodontitis was found in 92.85% of patients in group I and in 100% of those in group II (NS). Gingivitis was present in 33.33% of patients in group I and in 100% of those in group II (p <0.001). The accompanying dental and dental lesions are analyzed.
CONCLUSIONS: Periodontitis is a common disease in cardio-surgical patients. Gingivitis is significantly more frequent in patients with degenerative cardio-surgical disease.

00168

Aneurysm of the left main coronary artery: case report

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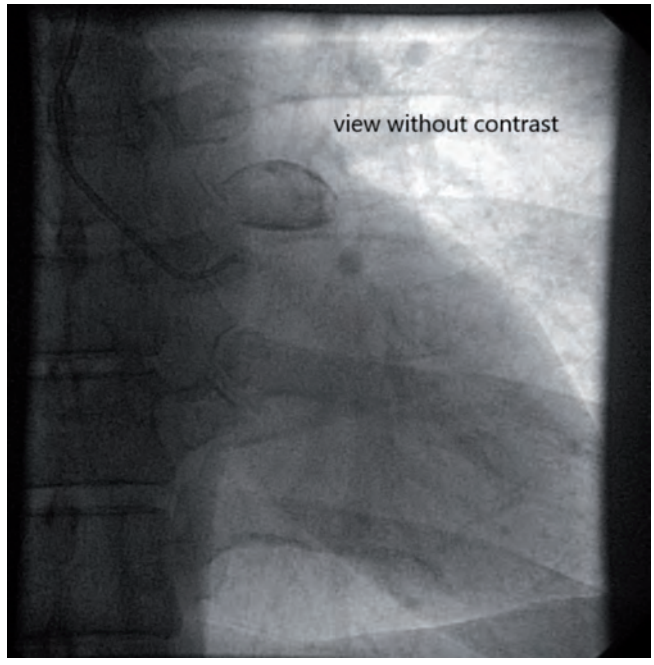
BACKGROUND: Left main coronary artery aneurysm is an uncommon coronary anomaly, with a frequency of 0,1% in large angiographic series. The majority of them are atherosclerotic. Other causes include connective tissue disorders, trauma, vasculitis, congenital, mycotic and idiopathic. The main complication is myocardial ischemia or infarc-



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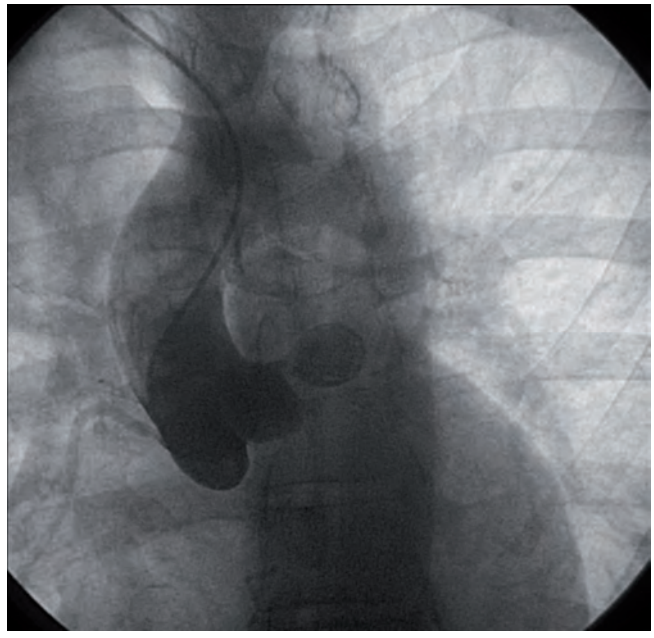

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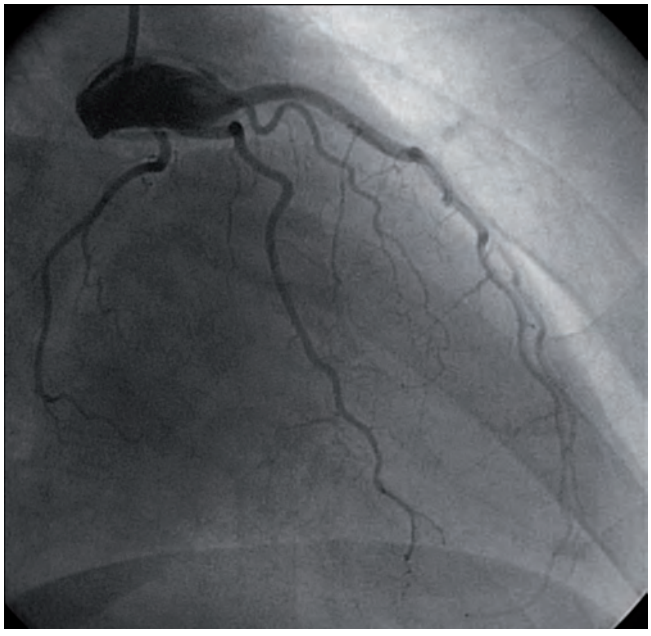

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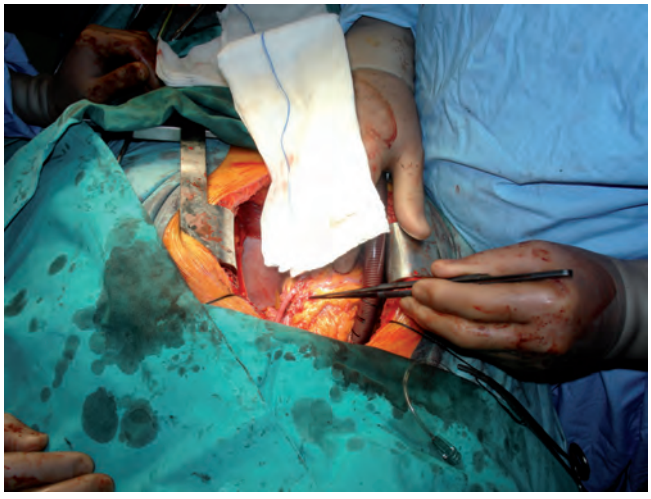

Figure 4.

tion, rupture is rare. Treatment options include anticoagulation, custom-made coated stents, reconstruction, resection and CABG exclusion.
CASE REPORT: In a 44-year-old woman without typical angina symptoms, complaints of mild fatigue with ordinary physical exertion and tachycardia attacks the coronary angiography performed revealed 3 x 2 cm saccular aneurysm originating from the distal part of the left main coronary artery. There is no evidence of hyperlipidemia from laboratory tests. The operation was performed with cardiopulmonary bypass, hyperkalemic arrest through retrograde and antegrade blood cardioplegia. The aneurysm is located in a typical place - in the groove between the left atrial appendage and pulmonary trunk, with calcified walls and severe adhesions with surrounding tissues. Three major vessels originating from the aneurysm were ligated, and through a small aortotomy the ostium of the LCA was obturated by running stich. A triple coronary artery bypass was performed through both internal thoracic arteries and a saphenous vein graft. The postoperative period was uneventful. The patient was discharged on the fifth postoperative day without complications.

00381

Surgical correction of a rare case of aortic arch dextraposition with aneurismatic dilatation causing dysphagia

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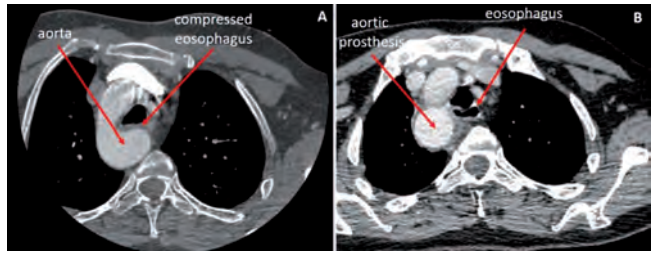
BACKGROUND: A Kommerell's diverticulum (KD) is an aneurysmatic remnant from the developmental stage of the aortic arch. Such a dextraposed aneurysmatically dilated aorta can be a cause of significant eosophageal compression and dysphagia. During childhood most common are airway compression symptoms whereas in adult age patients most often present with dysphagia and chest discomfort.
CASE REPORT: Here we present a case of a 37 year old male presenting with a worsening dysphagia and weight loss progressing in the last 6 months. After performing CT angiography, right sided aortic arch with a Kommerell's diverticulum without an abnormal left subclavian artery, causing compression of the eosophagus (see figure 1A.). Eosephageal compression with limited passage was confirmed by a barium swallow (figure 2.). After diagnosis a surgical repair was carried out via



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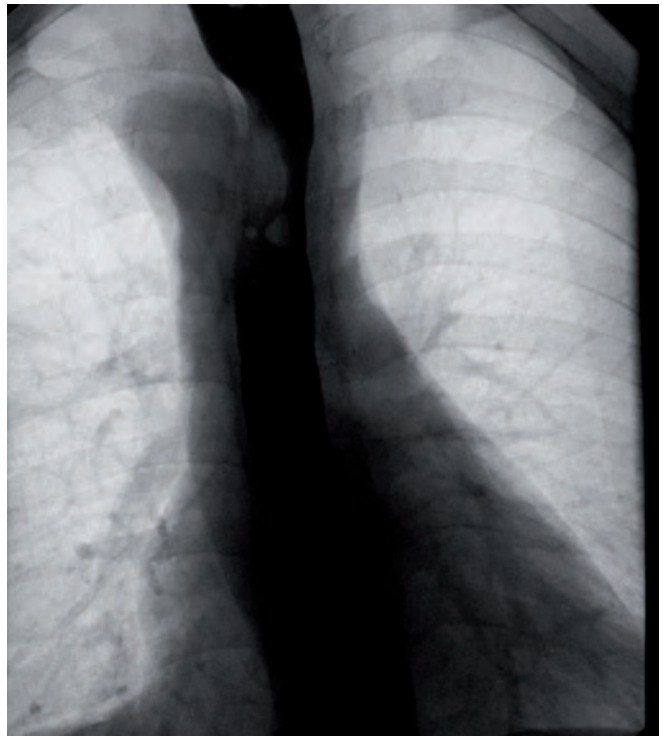

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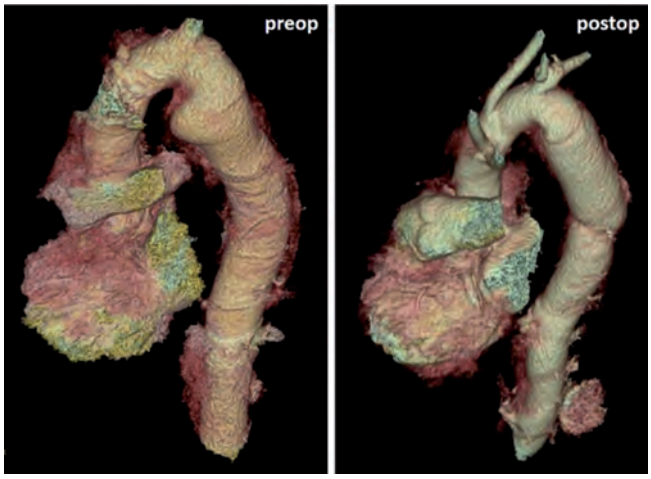

Figure 3.

right sided thoracotomy replacing the dilated segment of aorta with a 26 mm tubular graft. After surgery patient spent 2 days at the ICU and was discharged home without any complications and with immediate improvement to swallow function on postoperative day 12. Patient has had a 6 month follow up with a good result in a CT scan (see figures 1B and 3) and no signs of dysphagia.

00368

Replace or not-replace aortic sinus portion in ascending aorta aneurysm: comparison of Bentall operation *versus* ascending aorta and aortic valve replacement

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BACKGROUND: Ascending aorta aneurysm is a relatively common pathology in the field of cardiac surgery. Most of them associated with aortic valve pathology. Although there is more consensus about the indication of surgery in these cases but there is less agreement for type of surgery. Non-spareable severe aortic valve disease with enhancing ascending aorta diameter ultimate generally Bentall operation (BO) but in some circumstances we could do supra-coronary ascending aorta and aortic valve replacement (AA). Aim of this study was to evaluate and compare the results of these two procedures.
METHODS: From 2002 until 2017, from a total of 300 patients, 222 (86.5%male) patients underwent BO and 78(61.5% male) AA by a single surgeon in our center. Mean age were 45.1±0.9 and 52.7±1.9, aortic cross clamp times were 101.5±3.1 and 114.5±9.3 min and cardiopulmonary bypass time were 157.64±4.9 and 157.7±7.8 min in BO and AA groups respectively with significant differences just in age (P=0). Concomitant procedures were performed to a similar extent (BO, 38.5% [85/222] vs. AA,48.7% [38/78]; P=0.107).
RESULTS: In-hospital mortality rate was 5.4% in BO group vs. 6.4% in AA group without significant difference (p=0.74). ICU stay were significantly longer in AA group: 4.4±o.3 days in BO group *versus* 6±0.8 days in AA group (p=0.001). Although AA group received more blood transfusion, but it wasn't significantly important (p=0.27). Also blood drainage in ICU had not significant difference between two group (p=0.7).
CONCLUSIONS: In spite of older age, longer ICU stay and more concomitant procedures in patients that aortic valve and ascending aorta replaced seperately but in-hospital mortality and operation times were similar between two groupsto decrease. So it seems that we could replace ascending aorta and aortic valve seperately in high risk patients instead of Bentall procedure to have a better outcome.

00336

Mitral valve repair: three most chllenging cases. How I managed

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BACKGROUND: Mitral Valve Repair (MVR) should be individualized to patients considering the sonographic evaluation preoperatively as well as intra-operative findings. Attempts to preserve the morphology of the Mitral Valve Apparatus during the procedure is important to obtain good results post-operatively. MVR over replacement in difficult situations may prevent post-operative complications such as unwanted effects of prolong Warfarin usage, poor complaince to drugs, incidence of infective endorcarditis and complications associated wit LV remodeling. Also preservation of native valve is more physiological and cost effective to the patients. But close follow-up is mandatory during the first few years to prevent progression of the disease, ecspecially due to hemodynamic changes which occur on the rest of the native valve and proper island-wide post-operative follow-up protocol should be implemented to such patients. Our aim was to assess the post-operative success rate after MVR in 3 most challenging cases. Here we tried to preserve the anatomical intergrity as well as the function of the valvular apparatus to reduce the short and long term complications.
CASE REPORT:
Case 1- 20yr old lady who presented with acute infective endorcarditis and was found to have vegetations in P1,P2 and S1 segments of MV. Affected parts were completly excised.Instead of opting for a mechanical valve,MV repair was attempted by sliding the remaining parts of the P2 and P3 segments to fill the defect created by the removal of vegetations. Carpentier-Edward annuloplasty ring(28mm) placement and intra-operative valve checking by saline test revealed a small central regurgitant jet.Post-operative 2D-echo showed grade 1-2 MR. Post operative day 1 the patient was hemodynamically stable without ionotropes and was extubated.Sonographic findings after 5 yrs did not reveal any recurrence of disease and LV function was normal.
Case 2- 56yr old male with triple vessel disease associated with severe MR underwent CABG+MVR. Artificial neo-chords replacement to A2 and p3 segments, P2 resection and mobilizing it to cover the A1 segmental defect and 32 annuloplasty ring replacement were the main procedures during the surgery.Post-operative trans-oesophageal ECHO was satisfactory with grade 1 MR. Case 3- 43yr old male with severe MR was found to have prolapse of A2 and P2 segments and defect of A3 segment. MV repair was done by P2 segment resection and repair,artificial chords to A2 and repairing the defect in A3 segment. MVR was done by P2 segment resection and repair,artificial chords to A2 and repairing the defect in A3 by closing the defect in A3 with resected P2. Post-op TOE revealed a successful repair with grade 1 MR

00121

Pre-and postcondition of coronary artery and myocardium for isolated mitral valve replacement

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National Amosov Institute of Cardiovascular Surgery, Ukraine, Kiev

BACKGROUND: Aim of the study was to present analysis of pharmacological supporting of conditions of coronary artery and myocardium (pre and postcondition) during isolated mitral valve replacement (MVR) and to present analysis of pharmacological supporting of conditions of coronary artery and myocardium (pre and postcondition) during isolated mitral valve replacement (MVR).
METHODS: During 2015-2016 y 203 patients (pts) with isolated pathology of mitral valve disease were operated by mitral valve replacement MVR in department of surgery of acquired valve diseases. There were 91 (44,8%) males, 112 (55,2%) females. Average age was 64,4±8,7 yy. NYHA class in all group were followings: III class - 77 (37,9%), IV class - 126 (62,1%) pts. Concomitant proce-

dures: TV`s plasty (n=9), LA`s plasty (n=41), Maze (n=29). Pharmacological supporting of conditions of coronary artery and myocardium (PSCCAM) was performed by applying during 20 minutes of 100 ml solution with following drugs: papaverine 40mg + verapamil 5mg + ATP 50,0 mg. All pts were divided at 3 groups: group A - PSCCAM was applied before starting of CPB - 37 pts; group B - PSCCAM was applied before starting of CPB and the same dose was used after declamping of aorta - 39 pts; group C - only MVR 127 pts. Systemic hypothermia 32-34 C, cardiopulmonary bypass, retrograde cardioplegic solution (Custadiol) (in dose 20 ml/kg) were occured in all pts. Average time of improvement of cardioplegia solution was 21,2±3,9 minutes. Average cross-clamping time (min) were: 69,3±8,1 and reperfusion time - 29,1±4,5. Absence of using blood product in 48,5%.
RESULTS: There weren`t any pts of hospital mortality. Average doses of dobutamin (1,8±0,6 mcrg/min/kg) were marked (hours) for: group A - 24,8±7,2; group B - 19,1±5,7; group C - 39,5±5,4 (p <0,05). Average level of MB KFK (U/L) at 2-td postoperative day were occured for: group A - 56,3±7,2; group B - 53,4±6,8; group C - 61,1±9,3 (p<0,05). Duration of stay on artificial lung ventilation (hours) were: group A - 7,1±0,9; group B - 6,9±0,7; group C - 7,4±0,5 (p>0,05). Average time of staying in intensive care unit (hours) were: group A - 47,2±5,6, group B - 43,3±6,5, group C - 48,7±5,7 (p <0,05). Average time of improvement of cardioplegia solution was 21,2±3,9 minutes. Average cross-clamping time (min) were: 69,3±8,1 and reperfusion time - 29,1±4,5. Absence of using blood product in 48,5%.
CONCLUSIONS: Both variances of pharmacologic supporting of conditions of coronary artery and myocardium (group A,B) had improved myocardial protection compare with group C (p<0,05).

00120

Mitral valve replacement without usage of donor blood

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CASE REPORT: To study features of mitral valve replacement (MVR) without use of donor blood or its components.
METHODS: 489 patients (pts) with isolated mitral valve disease were operated Mitral Valve Replacement (MVR) in National Institute of Cardiovascular surgery (CVS) in period from 01.01.2000 till 01.01.2008. All operations were carried out without using of donor blood or its components during treatment, and while cardiopulmonary bypass (CPB) haemoconcentrated columns, or a sell-savers were not applied. There were 214 males and 275 females. Mean age was 51,8± 6,2 yy. To IV class by NYHA classification belonged 312 (63,8 %) pts, 178 (30,3 %) patients to III class and 29 (5,9 %) patients to II class. At 372 (76,1%) patients 400-450 ml of blood on citrate was taken before the cross-clamping. Diuresis was stimulated on the beginning of operation by 80 mg furosemide and 100 ml mannite. Patient was completed by 6 % refortane in a doze 250-300 ml before starting cardiopulmonary bypass (CPB), and the water balance on this stage was in the ranges +200,0 ml-0. All operations were carried out in conditions of moderated hypothermia and retrograde crystaloid cardioplegia in a combination to external heart cooling. By the time the end of perfusion the water balance did not exceed ranges of 700-900,0 ml. After a stop of cardiopulmonary bypass (CPB) its contents by maximum was returned to patient, including full evacuation of the cardiopulmonary bypass (CPB`s) reservoir. Average time of cross-clamping was 53,4±7,2 min, bloodless - 242,2±34,8 ml.
RESULTS: Hospital mortality (HM) among 489 pts was 0,6 % (3 pts died). Duration of stay on artificial lung ventilation was 5,5 ± 0,8 hours, in intensive care unit - 59,5 ± 7,5 hours, average time of the postoperative period was 11,1 ± 0,9 days. At discharge moderate anemia (reduction of hemoglobin from 145 ± 9,8 g/L to 105 ± 14,3 g/L from initial) was marked. By the time the end of perfusion the water balance did not exceed ranges of 700-900,0 ml. After a stop of cardiopulmonary bypass (CPB) its contents by maximum was returned to patient, including full evacuation of the cardiopulmonary bypass (CPB`s) reservoir. Average time of cross-clamping was 53,4±7,2 min, bloodless - 242,2±34,8 ml.
CONCLUSIONS: We recommend our method of Mitral Valve Replacement MVR without use of donor blood and its components. Exceptions for it are significant anemia (hemoglobin less than 120) and weight of patients less than 65 kg.

00229

A new training method to improve deep microsurgical skills in coronary surgery

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BACKGROUND: There have been many methods for common microsurgical techniques, including suturing of surgical gloves, silicone tubes and different animal models. However, there have been no reports of training methods to improve deep microsurgical skills under the various hand positions specific to deep wound access during the coronary revascularisation operations with non-direct view (operative microscope).
METHODS:
Initial training with the different microsurgical forceps, scissors and needle holders
Learn the difference in usage of magnification devices – loupes and microscope.
Working in static standing position
Working in limited access space - plastic transparent box with 15 to 5 cm depth aperture – imitating open chest access and MIDCAB
Polyethylene block with silicone glove with oblique placed training card.
Video-controlled training to record and analyze the student`s errors.
Work with microsurgical needles and suture on a low resistance material under A) binocular 2.5x or 3.5x and B) microscope magnification 4X to 16X
Performing knots using standard microsurgical technique
Second stage in microsurgical training for coronary surgery
Typical errors during training on animal model
RESULTS:
6 Students (residents with 1 year general surgery experience)
Each stage consists of 5 attempts.
First stage – DRY-LAB : Working on training cards
Second Stage – WET-LAB : Working on animal model (pig heart)
CONCLUSIONS: This alternative training method to improve microsurgical skills demonstrated effective model for training in field of coronary surgery for persons with basic surgical experience and can be recommended not only for training process, but also for assessment of education progress for every trained group and person.

"DRY-LAB"	Incision	Knot	Suture	Final knot	Group score
1 Attempt	1	0	1	1	3
2 Attempt	3	1	1	1	6
3 Attempt	4	3	3	2	12
4 Attempt	5	4	5	3	17
5 Attempt	6	6	6	5	23

Figure 1.

"WET-LAB"	Incision	Knot	Suture	Final knot	Group score
1 Attempt	2	3	2	2	9
2 Attempt	3	3	2	2	10
3 Attempt	4	4	3	3	14
4 Attempt	6	5	4	4	19
5 Attempt	6	6	6	5	23

Figure 2.

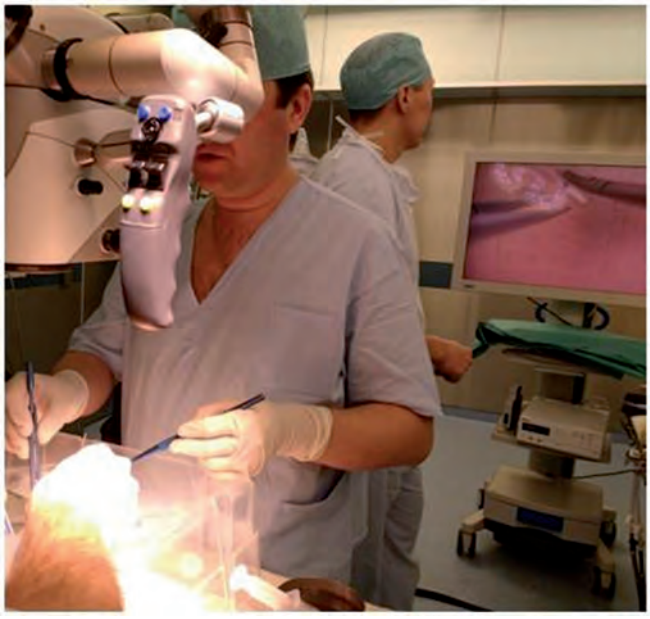

Figure 3.

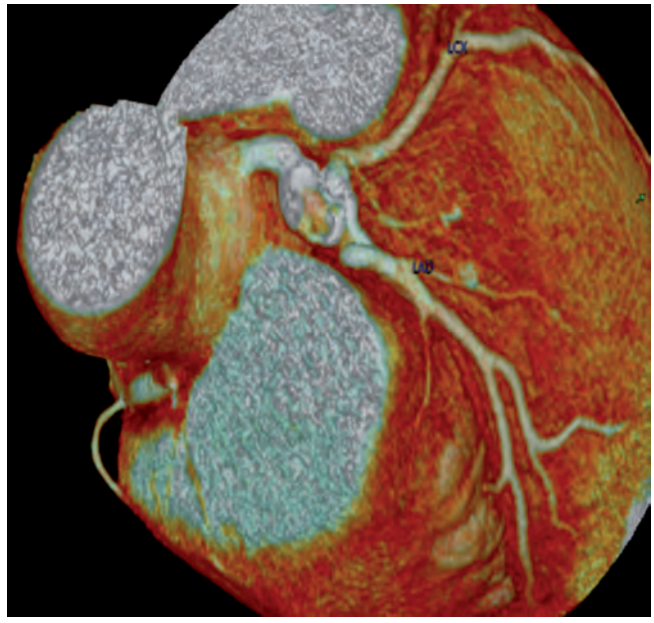

Figure 1.

00339

Ligature of left main after coronary surgery in Kawasaki's disease

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BACKGROUND: Kawasaki disease is a type of vasculitis that affects small and medium-sized arteries with predilection for the coronary arteries. It is more frequent in Asian countries, and the most important complication is the development of coronary artery aneurysms, that occur between 15-25% of the cases. Although the death rate associated with Kawasaki´s disease is very low, myocardial infarction due to stenotic lesions or thrombosis of the aneurysms continue to be a serious problem. Percutaneous coronary angioplasty is indicated in localized stenotic lesions not involving the coronary ostia, but coronary artery bypass grafting (CABG) should be recommended in cases with myocardial ischemia, ought to multi-vessel disease.
CASE REPORT: A 23 years-old man who was diagnosed of Kawasaki´s disease at the age of 13 months, and coronary artery aneurysms in right coronary artery (RCA) and (left main artery) LM were observed. He was treated with fibrinolysis and anticoagulant therapy during the acute syndrome. The complete regression of the RCA aneurism was observed 6 years after the diagnosis, however, persistence of the LM aneurysm was described with involvement of the ostium of the anterior descendent artery. One year before the current episode, the patient had an acute coronary syndrome due to a severe calcified lesion of the LM aneurysm (Figure 1). He underwent an emergent percutaneous coronary angioplasty, and a polyurethane-covered stent was deployed. The patient remained asymptomatic during the following year. In the current episode, he suffered from an acute coronary syndrome ought to a complete occlusion of the stent, despite correct anticoagulation and dual antiplatelet therapy. It was possible to percutaneously reopen the occluded LM, however, there was an evident severe stent malposition in the distal part of the LM and the patient was accepted for urgent cardiac surgery. He underwent off-pump CABG. Both internal mammary arteries (IMA) were dissected, the right IMA was grafted to the medial left anterior descendent artery, and the left IMA was grafted to the circumflex artery. Transit-time flow meter was employed to assess graft patency and although flow measures and pulsatility index were optimal, a high degree of competitive flow was observed through the recently reopened LM. A transitory tourniquet was applied to the LM

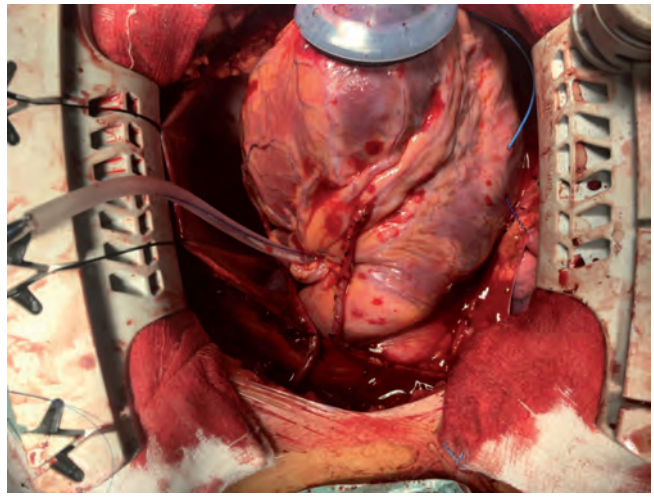

Figure 2.

(Figure 2) and there was a great improvement of the flow through the grafts, with a complete disappearance of the competitive flow. Therefore, the LM was ligated at the inflow of the aneurysm. The patient remains asymptomatic one year after the procedure.

00374

A systematic review: are outcomes of aortic valve repair a beneficial alternative for patients of aortic valve insufficiency?

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BACKGROUND: The young adult patients with aortic valve insufficiency as a myth undergo aortic valve replacement (AVR) and are forced to take anticoagulation medications for the rest of life due to prosthetic valve. This leads to many post-operative complications and drastic outcomes. Whereas, the in-vogue alternative of aortic valve re-

pair (AVr) is available and a lot more beneficial as well in longer time. The aim of this study was to learn if 'the outcomes of aortic valve repair are beneficial alternative for the patients suffering from aortic valve insufficiency in longer run.'
METHODS: Internet search using standard key words of 'Aortic Valve Repair and Outcomes' was used to find both white literature and grey literature with human, adult, English language and studies published after January 1st 2007 as limitations. Inclusion criteria was adult patients with aortic insufficiency with aortic valve repair as intervention with outcomes at least greater than five (5) years were considered. Exclusion criteria which was emphasized in order to complete this Systematic Review was as follows: all the case reports and series of studies from the same center were manually removed to avoid bias. At the same time, all the publications which did not mention aortic valve pathology clearly and did not outlined clear follow up information and/or surgical techniques intervened were not included in this study. In order to avoid publication bias internet search using many portals were carried out simultaneously and publications from the same center were also removed manually to avoid patient duplication bias. Studies which were recently published by the same authors were sorted out and were only considered to be included in this systemic review. Data Extraction and Analysis: All the data was extracted using Microsoft excel for windows and was analyzed using GraphPad Prisma.
RESULTS: 20 studies comprising of 5369 patients were included in this systemic review, which included 2 randomized control trails, 6 clinical prospective studies, 8 retrospective studies and 4 observational studies.
CONCLUSIONS: This study concludes that aortic valve repair is a beneficial alternative available for younger adults suffering from aortic valve insufficiency in longer time.

00135

Surgical treatment of the right ventricular outflow tract pseudoaneurysm after the cyanotic congenital heart defects complete repair

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BACKGROUND: Pseudoaneurysm of the right ventricle outflow tract is a rare complication in pediatric cardiac surgery. The aim of report is to present the cases of successful right ventricle pseudoaneurysm correction after cyanotic congenital heart defects complete repair with ight ventricle outflow tract reconstruction.
METHODS: From 1994 to 2017, in our institution 3 patients subjected at the age of 3, 7 and 9 years to the complete repair of tetralogy of Fallot in 2 patients and combined pulmonary stenosis in - 1. At follow up of 11, 2 and 1 years subsequently they underwent right ventricle outflow tract pseudoaneurysm correction. Reconstruction of the right ventricle outflow tract was made by a monocusp xenopericardial patch in 2, tri-leaflet xenopericardial conduit - 1. All patients underwent wide examinations before the redo operation.
RESULTS: There were no hospital deaths. In all cases, the communication between the right ventricle outflow tract and surrounding tissues was removed. In all cases, the aneurysmal inlet was localized in the area of the patch or conduit fixation to the right ventricle. In 1 case, residual right ventricle infundibular stenosis, in the second - recanalization of ventricular septal defect and subtotal thrombosis of the conduit with right ventricle-pulmonary artery systolic pressure gradients 50 and 125 mm Hg respectively were noted. In the third case monocusp xenopericardial patch endocarditis due to mediastinitis developed after combined pulmonary stenosis radical repair. In 2 cases, the operation was performed on a beating heart, in 1 case, canulation of femoral vessels was needed. Concomitant surgical procedures included subpulmonary stenosis resection (n = 2), reconstruction of anterior xenopericardial conduit wall and closure of recanalization ventricular septal defect (n = 1). The postoperative period proceeded without serious complications. All patients were discharged after 7-10 days in satisfactory condition. Systolic pressure right ventricle-pulmonary artery gradient was 7-25 mm Hg.
CONCLUSIONS: Possible causes of the right ventricle outflow tract pseudoaneurysm development may be residual right ventricular hypertension due to residual pulmonary stenosis and/or recanalization of ventricular septal defect and infection (xenopericardial patch endocarditis). Right ventricle outflow tract pseudoaneurysm correction immediate results are good.

00212

Massive spontaneous intracardial and intra-aortal thrombi during heart surgery combined with intrathoracic goiter resection: a rare case of disseminated intravascular coagulation

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BACKGROUND: Anticoagulation during open-heart surgery and associated complications, such as hemorrhage and thrombosis, are difficult to study due to the heterogeneity of patients and their pre-existing comorbidities. Disseminated intravascular coagulation (DIC) may complicate heart surgery and is characterized by pathological, excessive activation of blood coagulation resulting in the generation and deposition of thrombin and fibrin. This leads to formation of thrombi in various organs and can contribute to multiple organ dysfunction syndrome. Increased activation of the coagulation cascade depletes platelets and clotting factors required to achieve hemostasis, causing excessive bleeding.
CASE REPORT: We report a case of a 74 year-old woman who underwent coronary artery bypass grafting (CABG) and had a devastating clinical course, including the intraoperative formation of spontaneous, massive intracardial and intraaortal thrombi, disseminated intravascular coagulation (DIC), multiple organ failure (MOF) and stroke. The patient initially presented with severe dyspnea as well as chest pain. Her pre-existing conditions included retrosternal goiter, healed breast cancer, diabetes, obesity and arterial hypertension. The clinical examination was within normal limits except for an expiratory stridor and conspicuous palpable goiter. The CT scan showed a multinodular goiter reaching to the aortic arch with pronounced mediastinal shift. The patient consented to simultaneous goiter resection and subsequent perform CABG. The operation went regular until the intraoperative echocardiography suddenly revealed apparent thrombi in the left atrium (LA), for which open thrombus removal from the LA was performed. Furthermore, towards the end of the operation the patient was unable to be weaned from cardiopulmonary bypass, which necessitated the implantation of an extra corporeal life support system (ECLS). Shortly thereafter, clot formation was detected in the ECLS oxygenator, upon which the system was replaced. As a result, the patient underwent open-chest cardiopulmonary resuscitation. In the intensive care unit, the patient presented with coagulopathy and brisk bleeding from the chest tubes, requiring massive blood transfusion and the substitution of coagulation factors. Heparine-induced thrombocytopenia was excluded. A contrast-CT-scan unfortunately revealed total occlusion of the anterior cerebral artery, a long clot extending from the aortic arch into the abdominal aorta, as well as a collection of thrombotic material in the LA. In the face of a dismal prognosis and beginning multiple organ failure (MOF) despite maximal therapy, supportive care was initiated and the patient died. In conclusion, we report a case of CABG combined with goiter resection complicated by DIC and MOF, an extremely rare combination of pathophysiologic conditions. The peculiarity of the case consists of the variety and severity of complications.

00150

Bilateral IMA-CABG grafting through the left thoracotomy: the first year experience

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BACKGROUND: Median sternotomy is the most common access for cardiac surgery. It is well known that bilateral internal mammary artery-coronary artery bypass grafting (IMA CABG) yielded the best long-term results. However, instability of sternal bone and sufficient mediastinitis incidence are higher in the cases when both IMA were used.
AIM: We seeked to test an opportunity of using bilateral IMA CABG artery bypass grafting using left thoracotomy without sternotomy.
METHODS: We performed studies in sixty cadavers, carrying out right IMA (RIMA) harvesting through the 2nd intercostal space, without opening the right pleural cavity. We used radial artery or vein for anastomosis with RIMA and led the grafts through the retrosternal tunnel to the left pleural cavity, thus performing a distal anastomosis with coronary artery. Left IMA was harvested after left thoracotomy in the 4 or 5th intercostal space. As a rule, the left IMA was anastomosed to the left anterior descending artery.
RESULTS: Morphological studies in 60 cadavers showed a possibility to perform distal anastomosis between a conduit (right IMA-vein/artery) to any left coronary artery and right coronary artery branches. Eighteen surgical interventions were performed with good results, with a short follow–up period. Right IMA was extended with conduit to diagonal artery (4 cases), left circumflex artery (12 cases), or to posterior descending artery (2 cases). One-year follow up revealed good clinical results in sixteen patients. Additional angioplasty and stenting of coronary arteries were performed in two patients, i.e., due to severe stenosis of right coronary artery (previously it was 50%) in the 1st case, and sub-occlusion of venous conduit from right IMA to diagonal artery observed in the second patient. Coronary angioplasty and proximal stenting of left anterior descending artery and diagonal artery was performed. During the latest five interventions, we used a safer strategy, using retrosternal fat to prevent damage of conduit during future median sternotomy, if necessary. The best results were demonstrated with arterial conduits (compared to venous ones) from the right IMA to left coronary arteries.

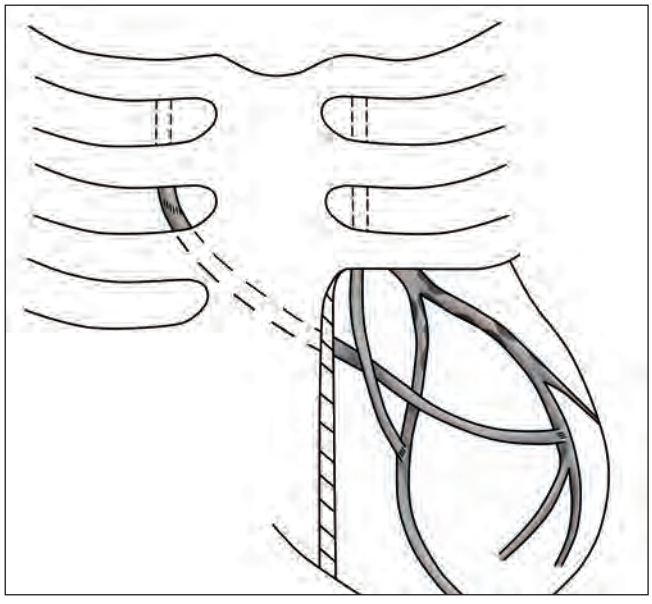

Figure 1.

CONCLUSIONS: Bilateral IMA-CABG grafting by means of left thoracotomy may be applied in patients with two-vessel disease with good results over a short follow–up period. The best results were demonstrated with arterial conduits (as compared with venous ones) from right IMA to coronary artery as shown during one year of follow-up. We need to evaluate the results at longer follow–up terms.

00373

Bare metal stent size: correlations with coronary stent restenosis

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BACKGROUND: The presence of metallic material in the coronary artery vessel wall triggers a cascade of physiological events, in response to the permanent presence of "foreign body", which led to the description of a new pathology called "restenosis in stent". Risk factors that may influence the development of restenosis after stent implantation are multiple and variable depending on the type of stent, morphology of coronary lesions, certain clinical or periprocedural parameters. Knowledge of clinical and angiographic variables, genetic factors or significant technical shortcomings that are correlated with risk of restenosis may help to guide selection of patients and to identify optimal type of stent to be implanted. The presented study aims to analyze the relationship between the size (stent diameter related to its lenght) of the "bare metal" stents (BMS) and the risk of restenosis in the first year after stent placement.
METHODS: The purpose of this study is to identify the technical characteristics of "bare metal" stents made of cobalt chrome alloy or stainless steel which are associated with a higher risk of restenosis during the first year after implantation. A total number of 808 coronary stent segments were angiographically analyzed, 472 (58.42%) of them presenting imaging criteria of restenosis. It was studied the relationship between the size of implanted stents (combination diameter / length) and the presence of restenosis at control angiography.
Inclusion criteria:
-patients with complete interventional revascularization with "bare metal" stent who underwent invasive angiographic evaluation within one year following the initial procedure
Exclusion criteria:
-patients who had at least one drug eluting stent (DES) simoultaneously implanted
-patients with stents in arterial or venous coronary grafts
-patients with initial suboptimal postprocedural results
-patients with major cardiac events in the first month after implantation
-patients with incomplete data aquisition of clinical and laboratory tests
Statistical analysis was performed with the following software: IBM Statistical Package for Social Sciences 22 (SPSS) and S-PLUS 8. We calculated OR and 95% CI to estimate relative risk assuming the fact that odds ratio over-estimate this risk.
RESULTS: A total number of 808 coronary stented segments were angiographically analyzed, 472 (58.42%) of them presenting imaging criteria for restenosis and 336 (41.58%) showing stents without restenosis. Most of them (351; 43.4%) had a diameter of 2.5 to 3.25 mm followed by those with a diameter ≤ 2.5 mm (248; 30.7%) and those with a diameter ≥ 3.25 mm (209; 25.9%). The stent length was another angiographic analyzed parameter. Thus, most frequently we found coronary segments with stented length of 15-28 mm (407; 50.4%), followed by those with length ≤ 15 mm (224; 27.7%) and length> 28 mm (177; 21.9%). We also analyzed distribution of implanted stent based on their size and location. The most frequent stents with average size (2.5 to 3.25 mm / 15-28 mm) were located at the level of left anterior descending coronary artery. The study results show that the use of stents with a diameter ≤2.5 mm and length 15-28 mm or those with small diameter (≤2.5 mm), average diameter (2.5 to 3.25 mm) and long length (>28 mm) are significantly associated with restenosis after stenting ($p < 0.001$).
CONCLUSIONS: Decreasing the diameter of the implanted stent or increasing the length of metallic material at the level of vascular wall is associated with a higher risk of clinical and imagistic recurrence. Clinical follow-up of these patients is required to be more frequent.

00024

Sternal wound infections after cardiac surgery: a single center experience

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BACKGROUND: Incidence of surgical site infections ranges between 0.3% and 8%. Deep sternal wound infection is a severe and life-threatening complication of median sternotomy after cardiac surgery, with an incidence ranging from 1% to 3% and a mortality rate ranging from 19% to 29%. This complication is associated with prolonged hospital stay, augmented surgical load due to repeated wound revision, chest wall instability and consequent respiratory impairment, and elevated financial impact on hospital stay. Therefore deep sternal wound infection is still challenge for the surgeons. In this retrospective study we analysed wound healing complications after median sternotomy at our centre.
METHODS: During the 2013 to 2017 years in 788 patients were underwent the cardiac surgery through the median sternotomy. We assessed outcome, prognostic factors and microbiological results of standardized wound swabs.
RESULTS: In total, 788 patients with an average age of 58.0 ± 4,3 years were analysed. In 711(90,2%) cases off-pump coronary artery bypass grafting (OPCAB), in 77 cases (9,8%) on-pump cabg (ONCAB) procedures were performed. The wound complication was diagnosed in 33 (4,2%) patients, and was observed more frequently after ONCAB (5/6,5% vs 28/3,9%, however the difference was not statistically significant). Superficial wound infections were diagnosed in 23 patients (2,9%), while 10 (1,3%) developed deep wound complications. Not any one case of in-hospital infection-related mortality was observed in this series. Insulin-dependent diabetes mellitus, COPD and BMI of >40 kg/m(2) were independent risk factors for both superficial and deep sternal wound infections. Microbial swabs of the sternal wound were taken in all 33 of the 788 patients (4,2%). In 7 patients (0,9%), no pathogen was identified and the wound appeared uninfected. These healing disorders were considered deep dehiscences. In this series 14 (1,7%) cases of superficial and 4 (0,5%) cases of deep wound complications were represented with the normal skin flora pathogens. Two patients with superficial complications suffered from Klebsiella pneumonia infection, and two from Pseudomonas aeruginosa infection. Two patients with deep sternal wound infection were represented with Pseudomonas aeruginosa infection, one with Klebsiella pneumonie and one with MR Staphylococcus epidermidis. All deep sternal wound infections were treated using active debridement and negative pressure drainage following with sternal reconstruction using local tissue. The overall postoperative in-hospital stay for patients with wound infection was 20,7±0,7 day.
CONCLUSIONS: The incidence of sternal wound infections after cardiac surgery according to our series during the period from 2013 to 2017 was 4,2%. Diabetes mellitus, obesity and COPD were the most important risk factors in this contemporary series. Prevention of infection and establishment of an effective appropriate treatment for sternal wound complications may improve the outcome of cardiac surgery.

00023

Intraoperative aortic dissection during off-pump coronary artery bypass surgery

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BACKGROUND: Intraoperative aortic dissection during cardiac surgery is infrequent, complicating surgical intervention in 0.04 - 1% of cases. Dissections can occur anywhere, most often as a result of direct mechanical damage at the location of the side clamp, site of cannulation of the aorta, or at the site of proximal anastomosis and may manifest as hematoma, bleeding at the cannulation site or bleeding from the proximal anastomoses or aortic suture lines. Delayed diagnosis and treatment can lead to extremely (23-41%) high mortality rate. To prevent this complication, a number of authors recommend strict control of systolic blood pressure during the performing of proximal anastomoses; avoidance of aortic clamping with the use of total arterial revascularisation or mechanical devices of a new generation to avoid any manipulations on aorta; and, in case of complications, aggressive replacement of the aorta with a prosthetic graft is positioned as a best approach. We conducted this study to identify current trends and risk factors for iatrogenic dissection.
METHODS: From December 2013 to November 2017 in Republican Research Center for Emergency Medicine 711 patients (mean age 54+/-2,3 years old) were operated electively. Off-pump coronary artery bypass grafting procedures was performed in all cases. Patients' preoperative risk factors, and operative and postoperative courses were analysed from the hospital records retrospectively.
RESULTS: Of the 711 patients who had off-pump coronary artery bypass, 2 (0.28%) developed iatrogenic intraoperative aortic dissection. Patients with the iatrogenic aortic dissection were in older age group (62 and 68 years old). Both patients had dissection extending beyond the arcus. IAAD was identified after removing the side clamp from the aorta in both patients, hovewer the intimal tear was located on the site of proximal anastomosis. Preoperatively, 2 (100%) patients had arterial hypertension and ascending aorta atherosclerosis. No other significant risk factors could be identified. One patient died due to intraoperative complete aortic rupture. In another case the hypothermic circulatory arrest was used and the dissected segment was replaced with a graft and proximal anastomoses were reimplanted in it. This patient required inotropic and respiratory support postoperatively. Mortality rate was 100%, second patient died due to respiratory distress on 10th postoperative day.
CONCLUSIONS: Intraoperative aortic dissection is an unpredictable and often fatal complication of cardiac surgery. Increased age, high blood pressure and atheromatous disease of the ascending aorta are significant risk factors for iatrogenic dissection. In this series, off-pump coronary artery bypass was not a risk factor for iatrogenic dissection of the aorta. Surgical interventions for iatrogenic aortic dissections require further improvement of surgical techniques and perioperative management.

00020

Acute type A aortic dissection during elective cardiac surgery: a case report

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BACKGROUND: Acute dissection of the aorta is a serious complication, accompanied with high mortality rate. Type A aortic dissection complicated an elective case, turns it into the complex intervention requiring maximum concentration of attention and strength. An increase in the incidence of intraoperative aortic dissection has been reported recently, attributed to the increasingly elderly patient population undergoing cardiac surgery and more off-pump coronary artery bypass. If not detected early, this complication can lead to rapid death from aortic rupture. Some autors recommend strictly control systolic blood pressure during the performance of proximal anastomoses; avoid aortic clamping through the use of sequential all-arterial grafts or new-generation mechanical connectors to prevent the dissection; and, in case of complication developed, aggressive replacement of the aorta with a prosthetic graft is seems to be the best approach. Here, we present the cases of 2 patients who sustained acute aortic dissection during OPCAB.
CASE REPORT: A 68-year-old man was schedulled for triple vessel off-pump bypass. After removal of the proximal partial clamp, the ascending aorta changed to a bluish color and bleedeing from the site of proximal anastomosis was observed. Despite of this, the surgery was continued in regular way and three venous grafts to the LAD, OM and RCA was performed. Surgical team made a mistake trying to resolve bleeding using wrapping the aorta. After the pa-

tient was transferred to ICU the bleeding in the drainage tubes was observed, patient was urgently transferred to the operating room. The chest was reopened, after the opening of the chest, the events developed dramatically. There was a complete rupture of the aorta with massive bleeding and cardiac arrest. Despite of resusitation procedures, patient died on the operating table. A 62-year-old woman with triple vessel disease was prepared for elective surgery, three coronary arteries LAD, OM and RCA were planned to bypass on the beating heart. After removal of the proximal partial clamp, the type A aortic dissection wa suspected, which was confirmed by epiaortic ultrasonography. Despite of this, the surgery was continued in regular way and three venous grafts to the LAD, OM and RCA was performed. Surgical team made a mistake trying to resolve bleeding using wrapping the aorta. In early postoperative period the malperfusion was observed and during Computed tomography scan type A dissection of the aorta was diagnosed. Patient was urgently transferred into operating room and dissection was treated surgically. Despite the inexperienced surgical team, the patient successfully underwent surgery and the simple tube graft ascending aorta replacement with the reimplantation of proximal anastomoses into the prosthesis under the hypothermic circulatory arrest was performed. The postoperative period was complicated with respiratory failure as a result of massive transfusion, as well as violations of cognitive functions, on 8-9 posoperative day patient was physically and mentally in good condition. However, the patient died on the 10th day after surgery as a result of respiratory distress syndrome.
CONCLUSIONS: Surgical interventions for iatrogenic aortic dissections require further improvement of surgical techniques and perioperative management.

00088

In-situ bilateral internal thoracic arteries length optimization during off pump coronary artery bypass grafting surgery

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BACKGROUND: *In situ* Bilateral Internal Thoracic arteries (BITAs) can be directed to revascularize the most important targets in ischemic patients scheduled for CABG. The length of the graft is the corner stone of this approach. Over the last five years, We shifted from the Y Graft where the LIMA In situ and the RIMA free graft anastomosed end to its side, to use both mammaries In Situ, In Situ BITAs, and gained surgical experience in optimization of the length to maximize the benefit of usage. We thought to evaluate and report our operative experience in maximizing the graft length through revision of our operative notes and data-base informations over the last five years.
METHODS: Retrospective analysis of Off-Pump CABG Patients done in our center, from Nov.2012 to Nov.2017. Inclusion criteria are elective, stable, isolated off-pump coronary patients where both BITAs were used in situ. Emergency, Urgent, unstable, on-pump, combind surgery and patients with one mammary are excluded. The number of additional surgical techniques rather than Full length Bilateral Skeletonization of the mammary arteries form the origin in the subclavian arteries to beyond the two terminal bifurcational arteries are revised, calculated and demonstrated. Pleural cavity preservation, Fixation of the apex of the upper lobe to the mammary bed, partial estimated obliteration of the oblique sinus cavity, Passing the RIMA through the transverse sinus and estimated plication of the enlarged free right atrial wall are all simple surgical techniques that maximized the In Situ usage of the mammary arteries. Intra-operative transit-time flows were obtained in all of the concerned patients. The early postoperative 30days cardiac free events was also reported.
RESULTS: Retrospective 380 patients could be reviewed and their data were collected during the period of study fulfilling the inclusion criteria.The two terminal bifurcational arteries of the IMA, Natural Y Graft, were used in 7 Cases (7/380) (1.84%) to revasularize the LAD and Diagonal (4 LIMA + 3 RIMA). Fixation of the apex of the upper lobe to the mammary bed in 25Cases (25/380) (6.57%) (18 left side and 7 right side). Partial estimated obliteration of the oblique sinus cavity in 6 Cases (6/380)(1.58%). Passing the RIMA through the transverse sinus to revascularize OM2 or PL of the left coronary artery in 12Cases (12/380)(3.16%). Lastly, estimated plication of the enlarged free right atrial wall to revascularize the PDA of the RCA in 4Cases (4/380) (1.1%). Intra-operative transit-time flows showed that the mean quantitative pulsatile flow, pulsatile index and also the DF (29.83 ± 21.62 ml/min, 2.95 ± 1.72 and 61.45 ± 14.23) at the end of the operation in the whole group in the normal accepted range. Postoperative CK-MB and cTnI was also satisfactory for 48h. The early postoperative 30days cardiac free outcome was uneventful.
CONCLUSIONS: Many simple surgical reproducible techniques or even stitches can add to the length of the In Situ usage of BIMAs and make it more feasible when done in a proper way in an indicated patient.

00211

Continuous renal replacement therapy with cytokine-adsorbing hemofilters for the treatment of autoimmune myocarditis

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BACKGROUND: Myocarditis is characterised by inflammation of the myocardium. Myocarditis has variable etiologies, and in adolescents, viral infections are the primary culprits. In the absence of infectious agents, auto-immunopathology can be suspected. A sub-group of patients require emergency assistance as they present with fulminant myocarditis: fever, severe heart failure and cardiogenic shock. The endomyocardial biopsy, followed by rapid pathology and immunohistochemistry analysis, is the gold standard in diagnostics, but it is infrequently used due to the risks and variable sensitivity. Treatment of myocarditis is mainly supportive, and in the initial stages, it requires an intensive level of hemodynamic support, including positive inotropic agents, diuretics, angiotensin-converting enzyme (ACE) inhibitors and digitalis. Upon stabilisation of the patient, one should consider β-blockers, vasodilators, and aldosterone antagonists. Regardless of the interventional course undertaken, a question remains if patients with an inflammatory signature could benefit from adjuvant therapy that reduces systemic inflammation. Immunosuppressive medications have been studied previously resulting in inconsistent clinical outcomes. The use of Continuous Venovenous Hemofiltration with Cytokine Adsorbing Filters successfully applied in the treatment of bacterial sepsis, represents an attractive approach to eliminate inflammatory mediators that promote Myocarditis progression.
CASE REPORT: We hospitalised an 18-year-old female with chest pain, tachycardia and nausea. The symptoms originated one week before and were initially accompanied by fever. Her condition rapidly deteriorated in the last 48 hours, which prompted her admission to our hospital. At this point she was afebrile. However, echocardiography showed a globally reduced contractility with a Left Ventricular Ejection Fraction (LVEF) of 41% and an intraventricular septum (diastolic) (IVSd) of 11 mm. No significant cardiac dilatation was observed, with left Ventricular Mass index of 71.2 g/m2. White Blood Counts (WBC), Troponin T, Brain natriuretic peptide (BNP), and C-Reactive Protein (CRP) levels were 11,27 x 103/μL, 2.6 ng/mL, 349.9 ng/mL, and 6.0 mg/L, respectively. Negative hemocultures, nasopharyngeal swabs and Procalcitonin (PCT) levels of < 0.5 ng/mL excluded the likelihood of a bacterial infection. Multi-Plex RT-PCR on a panel of common viral causative agents: Enteroviruses, (Para-)Influenza,

Rhinovirus, Coronavirus, RSV, HIV, Echoviruses, Hepatitis, Rubella, Parvoviruses, Parechovirus, Bocaviruses and Cytomegaloviruses, failed to identify a causative agent. No other diagnostic procedures were attempted, and a course of management suggested an acute case of heart failure, possibly autoimmune Myocarditis. The initial course of action consisted of Dobutamine (4.76 µg/Kg/min), Heparin (500U/mL) 2 mL/h and empiric Imipenem/cilastatin 500mg i.v. q.6h. The patient was placed on continuous venovenous hemofiltration using cytokine-adsorbing filters (CVVHF-CAH) (Prismaflex oXiris system) with a flow rate of 35 mL/kg/h. The patients experienced mild seizures, < 5 secs, 10 h into the CVVHF-CAH, and she later admitted that she had suffered from occasional seizures and febrile convulsions since early childhood; our examinations uncovered no neurological abnormalities. The initiated course of action led to improvement in the patient's overall clinical condition; Troponin T (0.05 ng/mL) and CRP levels (1.9 mg/L) were markedly reduced compared to baseline values. We terminated the CVVHF-CAH, antibiotic therapy and the inotropic support at this stage. In the subsequent days her physical condition further improved, but none the less the Left Ventricular EF of 45%, septal hypokinesis and elevated BNP levels (459 ng/mL) pointed to persistent cardiac damage. The patient was discharged after ten days of hospitalisation, but we expect long-term follow up to determine the extent of the damage to the heart.

00324

Comparative characteristics of the incidence of pericardial effusion in Ukraine over the past 30 years

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BACKGROUND: Analyze the incidence of pericardial effusion (PE) in the National Institute of Cardiovascular Surgery named after NM Amosov for the last 30 years.
METHODS: From January 01, 1987 to December 31, 2016, 850 (100%) patients with PE were examined at the National Institute of Cardiovascular Surgery named after Mykola Michailovich name of Amosov. For comparative characteristics, they are divided into two groups: group A-397 (46.7%) patients in the period from 1987 to 2007. and Group B 453 (53.3%) from 2008 to 2016 when they started using virus identification. In 1 g (100%) pericardiocentesis (PC) was performed to all patients (129 times (34.6%) times, pericardectomy (PE) was performed in 153 (41%) patients. , of which 36 (8%) are PE after the 1st ericardiocentesis (PC).

TABLE I.

Etiology	Group A		Group B		Total (n)	Total%
	n	% in this group	n	% in this group		
PE associated with the infectious process	50	12,6	179↑	39,5↑	229	27↑
PE associated with the oncological process	105	26,4	169↑	37,3↑	274	32,2↑
Autoimmune PE	21	5,3	41↑	9↑	62	7,3↑
Other (including in / n effusion)	40	10,1	64↑	14,2↑	104	12,2↑
Idiopathic PE	181	45,6	0↓	0↓	181	21,3↓
Total	397	100	453	100	850	100
Mortality	18	4,5	0↓	0↓	18	2,1↓

RESULTS: Because of the morbidity, patients were divided into generalized etiologic factors and are presented in Table 1. (PE associated with the infectious process, PE associated with the oncological process, Autoimmune PE, Other (including in / n effusion), Idiopathic PE, Total, Mortality)
CONCLUSIONS: Given these results, it can be concluded that pericardial effusion (PE) in Ukraine is progressing and has a polymorphic structure, where in the overwhelming majority of cases the incidence has a viral and oncological etiology, the latter prevailing. Analyze the incidence of pericardial effusion (PE) in the National Institute of Cardiovascular Surgery named after NM Amosov for the last 30 years. For comparative characteristics, they are divided into two groups: group A-397 (46.7%) patients in the period from 1987 to 2007. and Group B 453 (53.3%) from 2008 to 2016 when they started using virus identification. In 1 g (100%) pericardiocentesis (PC) was performed to all patients (129 times (34.6%) times, pericardectomy (PE) was performed in 153 (41%) patients. , of which 36 (8%) are PE after the 1st pericardiocentesis (PC). All patients from the 2nd group were diagnosed and given adequate treatment, as indicated by a reduction in mortality (0%), recurrent PCs (0%), and PE (8%), which were performed after a diagnostic PC or in the presence of fibrin in the pericardial cavity excluding patients with oncological process, who underwent two-stage intrapericardial chemotherapy with cytostatics).

00156

Early outcome of intensive continuous hemofiltration for severe renal failure after cardiac surgery

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BACKGROUND: Continuous veno-venous hemofiltration remains the best treatment for the treatment of severe acute renal failure in patients undergoing cardiac surgery. The aim of this study was to test whether early and intensive use of continuous veno-venous hemofiltration achieved a better than predicted outcome in patients with severe acute renal failure undergoing cardiac operations.
METHODS: Between January 2007 and September 2017, 80 patients underwent postoperative continuous veno-venous hemofiltration. Mean age was 64.3+/-10. Thirty seven patients underwent isolated coronary artery bypass grafting. 13 other patients had post infarctual mechanical complications. 12 patients had ascending aortic dissection type A, one patient had spontaneous coronary artery dissection and another patient post traumatic ventricular septal defect. 3 patients had mitral valve endocardits, 3 redo surgery, and 7 bivalvular surgery, and 3 patients underwent aortic valve surgery associated with coronary artery bypass grafting. The mean preoperative creatinine was 2.6+/-2.2(g/dl).18patients were operated on emergency basis. 8 patients required preoperative intraortic balloon pump implantation.
RESULTS: There were 16 deaths (20%). 32 patients required postoperative intraaortic balloon pump. 11 patients underwent surgical reopening due to severe bleeding. The other postoperative complications included pulmonary edema in 7 patients, perioperative acute myocardial infarction in 4, multi organ failure in 5, sepsis in 4. Continuous veno venous hemofiltration was initiated at mean 48+/-36.5 hours after surgery and continued for 82+/-64 hours following the procedure. 42 survivors had a full recuperation of the renal function, 17 patients developped chronic renail failure and 5 of them remained anuric. The mean creatinine level after the intensive care unit stay was 2.5+/-1.8 (g/dl). Using multivariate logistic regression analysis, the intraortic balloon pump (p=0.006), low left ventricular ejection fraction (p=0.017), longer interval from surgery (p=0.012), duration of continuous veno venous hemofiltration (p=0.0063), cardiopulmonary bypass time (p=0.015 and preoperative hematocrite level (p=0.039) were strong predictors for early mortality. The Cox model revealed the intraaortic balloon pump (p=0.002), low left ventricular ejection fraction (p=0.02), long interval from surgery (p=0.009), older age (p=0.045) and non CABG surgery (p=0.0065) were strong predictors for overall mortality and not full renal function recuperation. The actuarial survival at five years was 72%.

CONCLUSIONS: Early and aggressive continuous veno venous hemofiltration is associated with better survival in severe acute renal failure after cardiac operations. The employment of continuous veno-venous hemofiltration offers acceptable outcome in this high risk group of patients

00220

Mitral valve replacement with small cavity of left ventricle: is missmatch reality?

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BACKGROUND: To determine significance of patient-prosthesis mismatch (PPM) (indexed effective orifice area < 1,2 cm²/m²) after isolated mitral valve replacement(MVR) in pts with small cavity of left ventricle (SCLV) (end-diastolic volume (EDV) ≤ 75 ml) during hospital period.
METHODS: 1811 adult patients (pts) with isolated mitral valve disease MVR were operated in Institute from 01.01.2000 till 01.01.2007. There were 127 (7,0%) pts with SCLV. There were 48(37,8%) males and 79(62,2%) females. Average age was 53,2+ 7,1. 110 (86,6%) pts belonged to IV NYHA class of heart failure, 17 (13,4%) - to III class. Previous closed mitral comissurotomy was performed in 31 (24,4%) pts, to 7 pts - twice (closed recomissirotomy by closed method). Valve calcinosis 3+ was marked in 33 (25,9 %) cases. Thromboses of left atrium was marked at 13 (10,2 %) pts, including massive in 3 pts. Systolic pressure in pulmonary artery was 99,1 ± 7,1 mm Hg. All operations were performed with cardiopulmonary bypass and moderate hypothermia with crystalloid cardioplegia. Average BSA was 1,87±0,32 m². Following prostheses were implanted: bileaflet (Saint Jude, Carbomedics, On-X, Edwards-Mira) (n=88) and monodisc as Alcarbon`s type (MIKS, LIKS) (n=40). Following prosthesis sizes were used: 23 mm (n=1), 25 mm (n=74), 26 mm (n=3), 27 mm (n=49). Average time of cross-clamping was 62,2+7,1 min.
RESULTS: Hospital mortality (HM) was 5,5% (n=7). It was higher in cases with 27 mm size of implanted prosthesis - 8,2% (n=4/49), than other group - 3,8% (n=3/78) (p <0,01). PPM (indexed effective orifice area = 1,03+ 0,03 cm²/m²) were marked in 21 (16,5%) pts with BSA >1,75 m² and size of prothesis 25 mm but theren`t influence on HM. But heart failure and PPM were marked in 5 (3,9%) pts with BSA>1,75 m², size of prothesis 25 mm and cavity of LV (EDV≤50 ml). In these cases implantation of 25 mm prosthesis is expedient, but for pts with EDV ≤50 ml and BSA>1,75 m² it may lead for significant PPM (indexed effective orifice area = 0,93+ 0,02 cm²/m²) and heart failure. During 5 postoperative days volume of left ventricle increasing on 15%. During this period inotropic support (dobutamin 4,0-5,0 mcrg/min/kg) is necessary. 23 mm prosthesis may be used in pts with body mass ≤ 45 kg (BSA<1,5 m²). Risk-factors for PPM SCLV`s group of pts on hospital stage were: very small cavity of LV (EDV≤50 ml) especially in pts with BSA>1,75 m². previous operation, pulmonary hypertension, mitral valve calcification 3+, duration of rheumatic disease ≥ 25 years.
CONCLUSIONS: Pts with SCLV are in group of higher risk for operation and increasing risk of PPM.

00196

Polyglycolic acid sheet with attached fibrin glue application for right atrial rupture after blunt chest injury

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BACKGROUND: Traumatic cardiac rupture is a very uncommon entity and has a very high mortality rate of 80%. Prompt diagnosis and emergency surgery play a crucial role to save these critically ill patients. Several biological or synthetic glues have been used in these emergent cases. We report that temporary control of right atrial rupture bleeding after blunt chest trauma using polyglycolic acid sheet with fibrin glue (TachoComb).

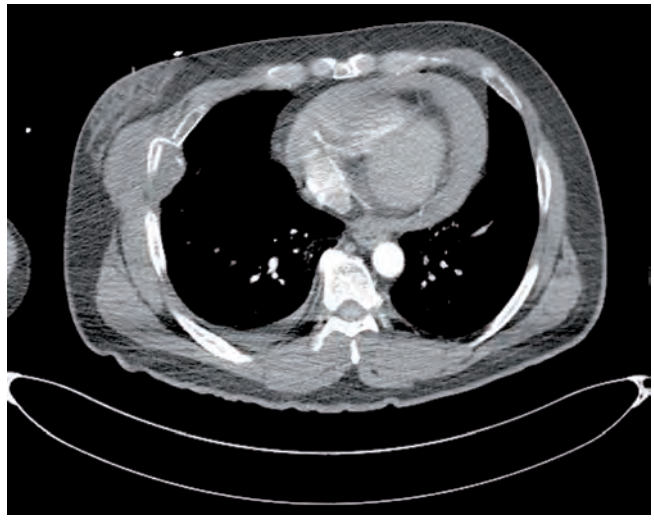

Figure 1.

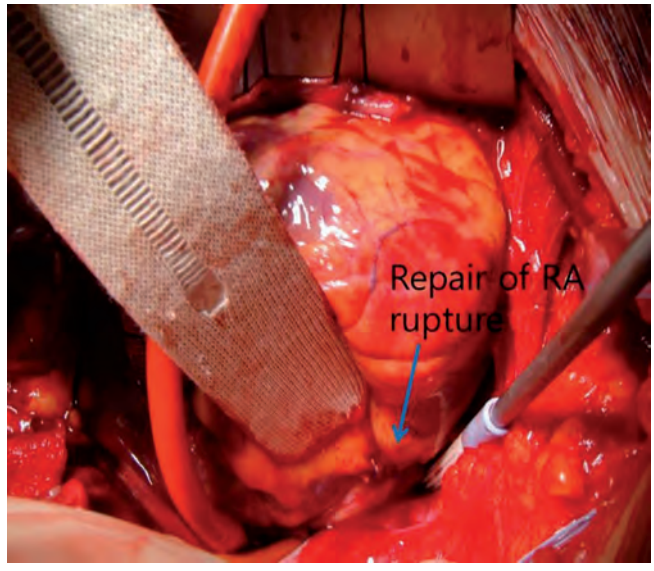

Figure 2.

CASE REPORT: A 46-year old male patient was transferred to our hospital because of car accident. Chest CT showed multiple ribs and sternal fracture, lung contusion, hemothorax, hemopericardium, and pneumomediastinum (Figure 1). His hemodynamic condition was worsening rapidly, with a systolic blood pressure of 60 mmHg. A Transthoracic echocardiography revealed cardiac tamponade. The patient was immediately taken to the operating room for exploration of cardiac injury. Median sternotomy was performed with pump standby. A sudden catastrophic hemorrhage occurred from the right atrial rupture site immediately after the pericardium was opened. One assistant performed direct open cardiac massage for about 3 minutes. We found that Right atrium – IVC junction site rupture, which was 5cm length and ran parallel to the right coronary artery. Direct manual compression for bleeding control of rupture site was not effective due to right atrial decompression associated with manual pressure resulted in aggravation of hemodynamic instability. We decided to use of polyglycolic acid sheet with fibrin glue: TachoComb (Torii Pharmaceutical, Tokyo, Japan) which was positioned on the RA rupture area. Active bleeding was stopped and then cardiopulmonary bypass was established. Under direct visualization, we removed Tachocomb patch and rupture site was repaired with 4-0 polypropylene sutures (Figure 2).

The postoperative course was uneventful. This experience suggests that the TachoComb patch is effective for temporary right atrial rupture control, especially which is located on inferior or posterior site of heart.

00130

The course of the early postoperational period in cardiosurgical patients with decreased ejection fraction of the left ventricle

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BACKGROUND: The aim of research is to analyze the course of the early postoperational period in cardiosurgical patients with decreased ejection fraction (EF) of the left ventricle.
METHODS: Results of the surgical treatment of 97 (72,9%) patients with congenital heart malformations underwent a retrospective analysis, 23 (17,3%) patients with acquired heart diseases and 13 (9,8%) patients with ischemic heart disease that received inpatient treatment in the department of the cardiac surgery. The female patients were 51,1%, males – 48,9%. Average bypass time in patients with congenital heart malformations was 79,0±8,1 min, in patients with acquired heart diseases – 106,4±64,0 min, in patients with ischemic heart disease – 146,0±71,1 min, but the aortic cross-clamping time respectively: 57,5±32,5; 83,0±43,0 and 99,5±52,5 min. According to Kraskell-Wallace's criteria, the difference between groups of patients with congenital heart malformations, acquired and ischemic heart diseases are statistically significant on indicators of age, EF of the left ventricle, end-systolic size, end-systolic volume, end-diastolic size, end-diastolic volume, minute volume, myocardial ischemia time, but there was a significant difference in on-pump time. To stratification of surgical risk we used such scales as EuroSCORE for patients with acquired heart diseases and ischemic heart disease, and Aristotle basic complexity score – for patients with diverse forms of congenital heart malformations.
RESULTS: The average values of EF of the left ventricle in both group of patients with congenital heart malformations is basically similar, in patients with acquired heart diseases it is differed in such a way that in smooth course of the postoperational period average indicators of EF of the left ventricle is comparatively little higher, but in patients with ischemic heart disease it is significantly higher. According to U-criteria of Mann-Whitney, the EF is significantly differed in the group of patients with ischemic heart disease, in smooth course (67,0±4,8) the value of the EF is higher than that of complicated course: 45,3±4,5 (p=0,014). In groups of patients with congenital heart malformations and acquired heart diseases there were not detected significant differences in EF of the left ventricle in patients with smooth and complicated courses: 68,8±0,8 and 68,4±1,6 in p=0,945; 63,7±2,0 and 59,5±3,6 in p=0,605 respectively.
CONCLUSIONS: EF of the left ventricle is an objective indicator of early postoperational course in patients with chronic forms of the ischemic heart disease. Decreased EF of the left ventricle in this group of patients can be an evident predictor of the development of postoperational complications in the early period, including lethality.

00396

Stenosis of all pulmonary veins. What are the reasons and what should be done?

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BACKGROUND: Atrial fibrillation (AF) is one of the most prevalent and clinically significant types of arrhythmias. Despite comparative safety of the procedure, such complication as pulmonary vein stenosis may develop in 36.4% cases and is usually of an asymptomatic character. However, according to different sources, frequency of symptomatic PV stenosis is revealed in 0,1-3% cases.
CASE REPORT: Tactics for patients with PV stenosis is not fully clear. In this case we tried to identify the reasons and ways of treatment of this complication.
METHODS: Patient M, 61 y. o. In 2008 coronary angiography was held, where critical multivessel coronary artery disease with LAD artery occlusion was revealed. CABG was performed. In November 2015 AF paroxysms appeared. In December 2015 radiofrequency ablation (RA) for PV isolation was performed. In December 2016 due to recurrence of AF paroxysm RA was re-performed. With the use of Ensite Velocity navigation extended antral PV isolation was performed with Blazer Open Irrigated electrode at 25-30 W. Additional line on the roof, LA posterior wall and origin of mitral isthmus was ablated because of different types of left atrial flutter with changing activation front. Activation front changed into right one, so right atrial activation map was built; the earliest activation was registered on anterior wall, next to superior vena cava: the origin was ablated with restoration of sinus rhythm during ablation. In 4 months, lung edema was diagnosed and according to MDCT data stenosis of all pulmonary veins was revealed.
RESULTS: Stenting of LSPV and balloon angioplasty of all other PVs were performed with use of Steerable introducer Agilis (Abbott). In one month as the second stage, stenting of RSPV and angioplasty of inferior pulmonary veins were performed. After 3 months of follow-up according to MDCT data stents were passable and inferior veins had no negative dynamics.
CONCLUSIONS: The reason of stenosis in this case was probably the complex of factors, including unstable navigation map, aggressive ablation or patient's reaction of tissues. Ensite Velocity navigation should be accompanied with additional visualization and immobilization of patient.

00375

Main pulmonary artery aneurysm secondary to pulmonary valve stenosis and jet lesion: a case report

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BACKGROUND: Pulmonary artery aneurysms associated with pulmonary valve stenosis are a rare clinical finding. There is no clear consensus regarding clinical management and potential surgical strategies. Overall, surgery remains the foundation of therapy for lesions involving the main pulmonary trunk and associated valvular pathology.
CASE REPORT: We present the case of a 61-year-old patient, known to our service since 2008 with a giant pulmonary aneurysm (64 mm at the time of the initial diagnosis) probably secondary to a pulmonary valve stenosis (mean gradient 15mmHg). The diagnosis was made after an incidental radiological finding for an unrelated pathology. Our initial approach was a conservative one, noting the absence of clinical relevant symptomatology. After regular clinical follow up we found an increase of size in the diameter of the aneurism to 79 mm. The patient presented an atypical thoracic symptomatology with intermittent chest pain, cough and exertional dyspnea. Due to a hypothetical risk of rupture and the associated pulmonary stenosis, we opted for an elective surgical approach. We performed a complex surgical repair with a complete aneurysm excision (involving the entire main trunk of the artery), excision of the pulmonary valve and replacement by a bioprothesis (Perimount 29 mm). The right pulmonary artery presented an internal diaphragm prompting an extended excision at this level. The right outflow tract was then reconstructed using a prothetic conduit followed by a reimplantation of the pulmonary branches. The postoperative course was uneventful, followed by rapid discharge.

00056

Case report of anticoagulation in a bioprosthetic valve with signs of early failure

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BACKGROUND: Advancements in imaging and prosthetic valves has physicians rethinking the role of anticoagulation in tissue heart valves.

Thrombus and leaflet motion restriction have been reported on surgical and transcatheter aortic (TAVR) bioprosthetic valves. The following case report illustrates the use of anticoagulation to treat a patient with signs of early bioprosthetic valve failure.
CASE REPORT: LB is a 25-year-old female with a history of an unicuspid congenital aortic heart valve. At 8 years of age she had an aortic balloon valvuloplasty. At the age of 23 she was recommended to seek a surgical opinion. Her echocardiogram demonstrated critical aortic stenosis (AS) with aortic valve area of 0.59cm², with a low normal EF 55%, peak gradient (Pg) 58mmHg, mean gradient (Mg) 35mmHg with left ventricular wall thickening (anterior 1.1cm and posteriorly 1.4cm). Her treadmill stress echocardiogram was positive for ST depression in aVF, lll and ll leads. She complained of chest pain at rest. Her CTA showed that her aorta was normal in size. On 6/29/2015 LB was taken to the operating room where 21mm bioprosthetic aortic valve was placed. Her hospital course was uneventful. She remained stable with normal valve function until approximately 1-year post-op. Her 6-month echo gradients were 26/16mmHg and at 1-year her gradients raised to 47/24mmHg. LB remained asymptomatic. She was brought back at 18 months and gradients continued to be elevated. She was sent for a 4D CTA and she returned in 3 months with a repeat echo. Her gradients remained elevated and the echo revealed that the leaflet closest to right coronary was not moving. However, the scan showed satisfactory leaflet motion without thrombosis or calcification of the valve. LB was empirically started on Coumadin. She continued to be closely monitored in the Research Nurse Practitioner's clinic. Within 6-months of starting Coumadin her gradients had returned to baseline 26/15mmHg and the leaflet restriction was gone. The patient was then switched to dual antiplatelet therapy, Clopidogrel 75mg and Aspirin 81mg daily. The patient will return in 6-months and if her echo remains stable the plan is to discontinue the Clopidogrel and increase the Aspirin to 325mg daily.
The American College of Cardiology and American Heart Association recommends dual antiplatelet therapy using a P2Y12 inhibitor and aspirin for coronary heart disease patients receiving a prosthetic heart valve. Dual therapy and sometimes triple therapy has been recommended for TAVR patients. Short-term anticoagulation may be beneficial in some patients who receive a tissue valve. More research is needed to better understand the risks and benefits.

00129

Clinical surgical experiences of cardiac operation concomitant with extra-anatomic bypass for complex aorta coarctation

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BACKGROUND: Complex aorta coarctation concomitant with cardiac lesions or multiple stenosis involving the aorta is rare and complex. Staged operations are acceptable and feasible. We report our experiences of cardiac operation concomitant with extra-anatomic bypass as one stage.
CASE REPORT: Coarctation of the aorta is a common congenital heart disease, it can be associated with other cardiovascular pathology, and its association with bicuspid aortic valve is well known and occurs in 50% of patients. Mild and unserious cases can be corrected by two stages, first stage with intra-cardiac operation with cardiopulmonary bypass and second stage with thoracotomy or catheter-based-intervention for coarctation. Several reports insisted one staged method with extra-anatomic bypass from ascending aorta to the descending aorta. But it continues to be controversial in regards to the safer and better approach. Two-staged approach may obtain better perioperative results with less invasive surgery. But the pressure difference of the distal part of aorta will induce lower flow during cardiopulmonary bypass and increase the injury due to ischemia and hypoxemia. One stage approach with a long graft connected with ascending aorta and descending aorta should open pericardial between inferior vena cava and right lower pulmonary vein, and exposure the descending aorta behind the esophageal, which will take more injury and prolong the bypass time, especially in complex cases. Otherwise, the graft-related complications are also cannot avoided, even oral taken with aspirin post operation.From December 2015 to December 2017, 5 patients (2 male, 3 female) with complex aorta coarctation have been treated in our institute. Among them, one patient underwent aortic valve replacement, tricuspid valve annuloplasty, radiofrequency ablation and ascending aorta to bilateral femoral artery bypass. One patient underwent mitral valve replacement, tricuspid valve annuloplasty, radiofrequency ablation and ascending aorta to thoracic descending aorta bypass. One patient underwent aortic valve reimplantation repair, PDA closure and ascending aorta to thoracic descending aorta bypass. One patient underwent coronary artery bypass and ascending aorta to thoracic descending aorta bypass. One patient underwent aortic arch resection and ascending aorta to thoracic descending aorta bypass. The perioperative data were collected. During follow up period, enhanced CT scan were regularly checked.No perioperative death existed. During follow-up period, all patients survived and revealed unobstructed prosthetic vessel and relieved symptoms. Intra-cardiac operation concomitant with extra-anatomic bypass can achieve acceptable results for patients with complex aortic coarctation and cardiac lesions. Coarctation of the aorta is a common congenital heart disease, it can be associated with other cardiovascular pathology, and its association with bicuspid aortic valve is well known and occurs in 50% of patients []. Mild and unserious cases can be corrected by two stages, first stage with intra-cardiac operation with cardiopulmonary bypass and second stage with thoracotomy or catheter-based-intervention for coarctation. Several reports insisted one staged method with extra-anatomic bypass from ascending aorta to the descending aorta. But it continues to be controversial in regards to the safer and better approach. Two-staged approach may obtain better perioperative results with less invasive surgery. But the pressure difference of the distal part of aorta will induce lower flow during cardiopulmonary bypass and increase the injury due to ischemia and hypoxemia. One stage approach with a long graft connected with ascending aorta and descending aorta should open pericardial between inferior vena cava and right lower pulmonary vein, and exposure the descending aorta behind the esophageal, which will take more injury and prolong the bypass time, especially in complex cases. Otherwise, the graft-related complications are also cannot avoided, even oral taken with aspirin post operation.

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Local preparation of skeletonized internal mammary artery in coronary artery bypass grafting surgery made easy

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BACKGROUND: Skeletonized internal mammary artery (IMA) is becoming our routine daily graft in our center and many other centers in the field of coronary artery bypass grafting (CABG) Surgery. However, still there is no consensus about the need for the local vasodilator drugs to optimize the graft condition and flow for the grafting. The topical application of papaverine is commonly used to almost all of the IMAs. During the last year of our practice, we hypothesized that the well skeletonized IMA(s) do not deserve the local pharmacological vasodilator effect of papaverine and actually was replaced with warm normal saline. We thought to demonstrate and evaluate our surgical technique in skeletonization of the IMA(s) and our local preparation pre-grafting and comparing two propensity matched groups of patients treated with local Papaverine *versus* with local warm saline.
METHODS: Retrospective analysis of two propenisity matched Groups of patients undergoing CABG Surgery. (GroupI, NS) (50 patients) where the IMA was treated with only warm Normal Saline soaked gauze and (GroupII, PV)(50 patients) where the IMA was treated with local papaverine soaked gauze. Inclusion criteria are elective, stable, isolated, totally

Off-pump coronary patients. Emergency, Urgent, unstable,On-pump and combined surgery patients are excluded for the purpose of the study. The primary end point of the study was the IMA flow measurements and was measured in both groups at three stations:1-The time of separation from its terminal branches (free flow) 2- Immediately before doing the anastomoses (free flow) and 3- After completion of the anastomoses (transit-time flowmeter Measurements, TTFM). The free flow was calculated directly in a graded bowel and the TTFM of the IMA graft at the end of operation in both groups. The postoperative ICU Course and cardiac free events F/U (3m.) are Secondary end points.
RESULTS: The directly calculated free flow in StationI: showed insignificant difference in the amount (71.15 ± 47.31 *versus* 74.41 ± 38.65 ml/min)(p=0.43). Although, the calculated free flow in Station II: showed higher flow in GroupII (78.25 ± 34.41 *versus* 93.71 ± 39.85 ml/min) but it was statistically insignificant (p=0.06). In Station III: No significant statistical difference was observed comparing quantitative pulsatile flow, pulsatile index and the diastolic flow fraction at the end of the operation in the two groups (31.57 ± 14.22 *versus* 36.42 ± 26.54 ml/min)(p=0.57) , (2.75 ± 0.92 *versus* 3.12 ± 0.69) (p=0.42) and (57.34 ± 16.12 *versus* 61.7 ± 13.51%)(p=0.47). The postoperative ICU Course and cardiac free events F/U (3m.) were comparable in both groups.
CONCLUSIONS: Careful skeletonization of the IMA and meticulous clipping of the branches minimizes the incidence of its vasospasm. The apparently seen higher flow in the IMA, immediately before grafting, is temporal and has no impact on the end result flow after completion of the anastomosis. The hydrostatic pressure of the blood flow against the clipped distal end of the IMA may be enough to create good flow of the graft.

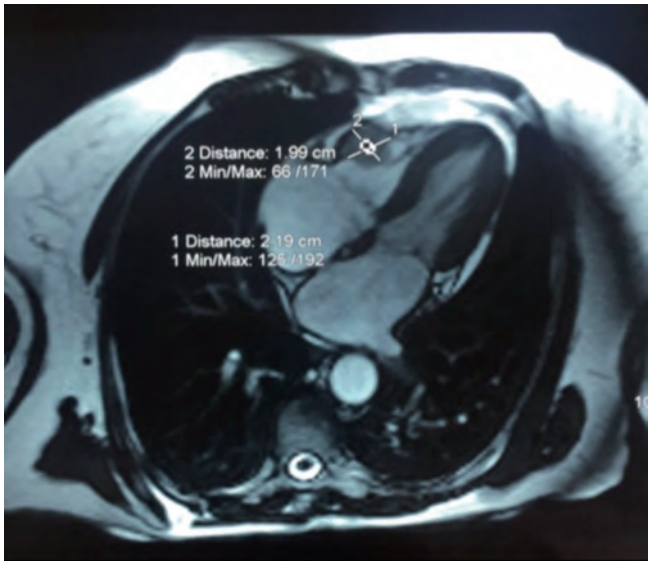
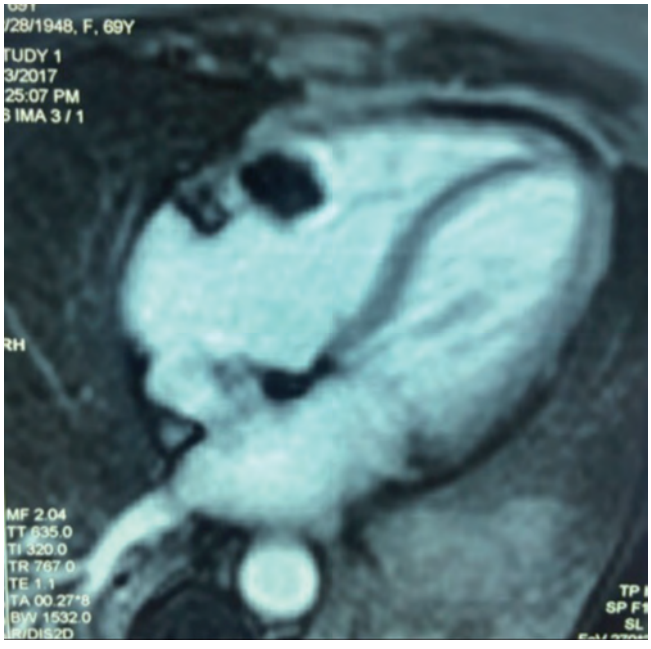


Figure 1.



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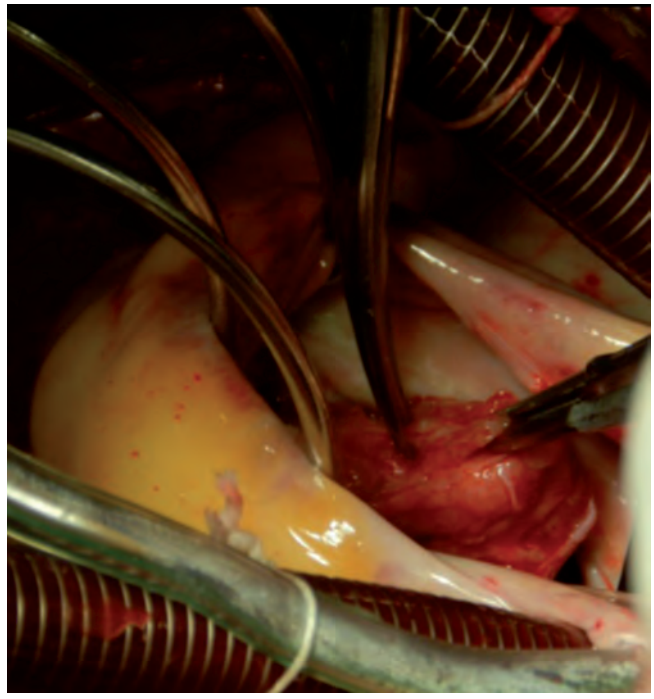
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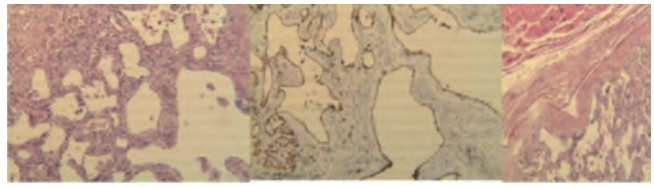
Figure 4.

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The arteriovenous hemangioma of the right ventricle

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BACKGROUND: Hemangiomas of the heart are exceptionally rare benign tumors constituting 1- 2% of all cardiac tumors, which may occur in all cardiac layers: pericardium, myocardium or endocardium. Their location in the right ventricle is highly uncommon and usually without any symptoms. Cardiac hemangiomas are clinically classified into three subcategories: capillary, cavernous and arteriovenous type. (1) This report accounts for a case of arteriovenous cardiac hemangioma, an extremely rare subtype of this tumor.

CASE REPORT: We report a 69-year old woman without any reported symptoms who was accidentally diagnosed with the tumor of the right ventricle during a routine echocardiography. She is a nonsmoker with previous history of hypertension, under control by means of therapy. Transthoracic echocardiography showed a mass in the right ventricle with no tricuspid regurgitation, normal right ventricle diameter and normal left ventricular function. Cardiac MRI showed a low-density mass 20x25 cm fixed with a small pedicle to the anterior wall of the right ventricle. The coronary angiography did not show signs of coronary disease. (Fig.1a,b) Laboratory test results were all within normal ranges, as well as serum tumor markers. Under general anesthesia, the median sternotomy was performed. After the institution of bicaval cardiopulmonary bypass, the heart was arrested with warm blood cardioplegia in normothermic conditions. The tumor was resected completely with a clear margin through right atriotomy, there was no involvement of the tricuspid valve. (Fig.1c) There was no need for ventricle wall reconstruction. The histopathology exam revealed the mixture of arterial and venous vessels confirming the diagnosis of arteriovenous hemangioma. (Fig2.a,c) Endothelial markers CD 31 were positive on immunohistochemical staining. (Fig2b) The patient was discharged on postoperative day 6 with the uneventful postoperative course. On six months follow-up, the patient is alive and well with no relapse of the hemangioma showing at control echocardiography.

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Management of Behçet's aortitis: a Tunisian single-center experience

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BACKGROUND: Aortic involvement during Behçet's disease is uncommon and linked to a poor prognosis. We report our experience in the management of such disease.
METHODS: Our series includes six patients, 5 men and a woman. The mean age was 44.16 years (range, 27 to 54 years). Diagnosis of Behçet's disease was confirmed accorded to criteria of « The International Study Group for Behçet Disease ». Aortic involvement was confirmed in all cases by computed tomography scan with 3D reconstruction.
RESULTS: Pseudo aneurysm was the most common lesion. Three patients underwent surgical treatment. Resection of aortic aneurysm and prosthetic interposition was achieved in 2 patients. Aneurysm flattening with closure patch was performed in one case. Three patients had an endovascular treatment with encouraging results in the medium term. A complementary therapy with immunosuppressive and / or corticosteroids was introduced before intervention and continued postoperatively in order to prevent recurrences.
CONCLUSIONS: Behçet disease is uncommon and prognosis is related to the presence of aortic involvement. Patient underwenting surgical procedures or endovascular approach must be in a complete remission. Endovascular treatment is more and more recommended for the management of inflammatory aortitis in Behçet's disease and saves patients from complications related to the surgical approach.

00404

Surgery for an isolated huge coronary artery aneurysm in a patient with Behcet's disease: case report and review of the literature

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BACKGROUND: Coronary artery aneurysms in patients with Behcet's disease are rare. Giant aneurysms defined as greater than 2 cm are exceptional. Surgical treatment is attitude of choice.
CASE REPORT: We are reporting a rare case of a 33-year-old man with Behcet's disease, admitted for chest pain, whose coronary angiogram revealed a huge aneurysm involving the proximal segment of proximal left anterior descending artery followed by a severe stenosis. The aneurysm was successfully resected and an arterial coronary bypass was performed. The patient was asymptomatic in the postoperative period. There is no consensus upon the management of coronary aneurysms in patients with Behçet's disease because of the rarity and unpredictable natural history of this condition. The closure of the coronary aneurysm should be considered case to case in view of the related risk of thrombosis or rupture. Surgery has been recommended for high-risk giant aneurysms. Percutaneous approaches with covered stents and coil embolization have been reported for the management of these patients with adequate use of immunosuppressant and anticoagulant therapy, however surgical approach is still considered the treatment of choice.

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Surgical treatment of concomitant carotid and coronary artery stenosis

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BACKGROUND: According to ESVS recommendations, the incidence of significant carotid stenosis (CS) in patients undergoing CABG ranges from 2.8 to 22%. On the other hand, 28-40% of patients receiving carotid endarterectomy (CEA) have significant concomitant ischemic heart disease. Despite of this, there is still a dilemma regarding the best treatment option for patients with severe carotid and ischemic heart disease. We presented a retrospective analysis of our initial experience with the simultaneous carotid and coronary arteries revascularization.
METHODS: Between 2013 and 2017, a total of 711 patients underwent coronary artery bypass grafting. All patients underwent carotid artery ultrasonography, coronary angiography, and neurological examination prior to surgery. In 45 of cases (6,3%) the concomitant carotid artery stenosis was diagnosed. Simultaneous intervention on the carotid and coronary arterial systems was performed in 18 patients (2,5%). The main indications for simultaneous surgery were the need for myocardial revascularization with concomitant 1. More than 70% symptomatic stenosis of the carotid artery (with or without contralateral disease) or asymptomatic more than 70% bilateral carotid artery stenosis. The mean age was 64,8 ± 1,9 years; 13 patients (72,2%) were men, 5 patients (27,8%) were women. Regarding to coronary artery disease 15 patients (83,3%) had triple-vessel disease, 1 patient (5,6%) had 2 vessel coronary artery disease, 2 patients (11,1%) had left main stem stenosis, and 9 patients (50%) had a reduced ejection fraction (lower than 40%). A total of 13 patients (72,2%) had a previous myocardial infarction, 10 patients (55,6%) had unstable angina. Five patients (27,8%) had internal carotid artery stenosis on the right side, 6 patients (33,3%) on the left side and 7 patients (38,9%) had bilateral carotid stenosis. In this series, 13 patients (72,2%) had a previous stroke, and 5 patients (27,8%) were asymptomatic. During the surgical treatment, carotid endarterectomy (on the side of a major stenotic lesion) was first performed, followed by the median sternotomy, systemic heparinization and a off-pump coronary artery bypass grafting (17/94,4%), in one case (5,6%) due to unstable hemodynamics, the coronary artery bypass was performed on-pump.
RESULTS: Carotid surgery was performed using open technique with an autovenous patch in all patients. The mean number of coronary grafts was 2,8 ± 0,4. In the postoperative period, 1 patient (5,6%) suffered from the ischemic stroke. One patient died on the 15th postoperative day due to respiratory distress. The average number of days in the hospital postoperatively was 13,5 ± 0,8 days. During the follow-up period of 12 months, one patient died of cardiovascular causes (stroke).
CONCLUSIONS: The incidence of concomitant carotid and coronary artery disease in this series was 6,3%. Simultaneous carotid and off-pump coronary artery bypass surgery is safe and effective method of treating patients with severe concomitant carotid artery stenosis and ischemic heart disease.

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