68th International Congress of the European Society of Cardiovascular and Endovascular Surgery

May 22-25, 2019
Groningen, The Netherlands

ABSTRACT BOOK

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ABSTRACT BOOK

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WELCOME ADDRESS

From May 22-25, 2019 the 68th edition of the European Society of CardioVascular and Endovascular Surgery (ESCVS) will take place in Groningen, the Netherlands. The event is organised, under the auspicien of the ESCVS, by the Departments of Vascular and Cardiothoracic Surgery in cooperation with the Wenckebach Institute of the University Medical Center Groningen (UMCG).

The ESCVS is the oldest society in Europe in the cardiac and vascular surgical field and was founded by René Leriche and R. Dos Santos in 1950. It has a strong tradition of merging specialties to provide better care for patients. The Society is actively engaged in projects involving its young members, to train them and give them the experience and knowledge of new techniques and materials.

During the event high-standard thematic keynotes and free presentations are combined with posters and a commercial exhibition in a concise area and sociable atmosphere in Groningen, the City of Talent! The Congress is intended for (members and non-members of the ESCVS) surgeons, interventional radiologists, cardiologists, perfusionists, medical technicians, trainees, nurses and all other physicians and researchers interested in the field of Cardiothoracic and Vascular Surgery. Well-known experts, from all over the world, will present their latest developments in this field.

ESCVS 2019 expects to host up to 1000 participants and we look forward to meeting you in the city of Groningen in May 2019.

On behalf of the Local Organising Committee,

Professor Clark ZEEBREGTS,
ESCVS 2019 Congress President
Professor Massimo MARIANI,
ESCVS 2019 Cardio-thoracic chair

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of the

European Society of Cardiovascular and Endovascular Surgery

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08:00 – 09:30

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Impact of off-pump to on-pump conversion on the results of coronary artery bypass grafting

Abdusalom Abdurakhmanov, M. Obeid

Republican Research Center of Emergency Medicine, Tashkent, Uzbekistan

BACKGROUND: Off-pump coronary artery bypass grafting (OPCAB) has been shown to be an effective strategy for surgical revascularization. conversion to on-pump during off-pump coronary artery bypass surgery (CABG) increases morbidity and mortality. The impact of conversion on the early outcome after CABG was analyzed.
METHODS: All patients undergoing isolated CABG between 2013 and 2018 were included. Patients were grouped according to their intraoperative conversion to cardiopulmonary bypass: (1) conversion for visualization or for hemodynamic instability, and (2) no conversion (OPCAB). Postoperative mortality and the postoperative complications (death, myocardial infarction, heart failure, rhythm disturbances, wound infections and cerebrovascular accident) were compared between patients with and without conversion.
RESULTS: A total of 1007 patients were operated off pump and 44 (4,4%) patients required a conversion. Postoperative death was more frequent among patients who were converted urgently (11.6% *vs.* 2.3%, P<0.001, respectively). Incidence of such postoperative complications as: heart failure and rhythm disturbances were higher among urgently converted patients (18,2% *vs.* 3,8%, P<0.001, and 15,9% *vs.* 5,8%, P<0.001, respectively). Conversion was an independent predictor of these events (OR = 4,97, 95% CI: 1.79 to 13,3; OR = 9.73, 95% CI: 4,52 to 20,92; and OR 2,74, 95% CI: 1.17 to 6,41, respectively).
CONCLUSIONS: Emergency conversion from off- to on-pump CABG dramatically worsens early outcome after off-pump CABG.

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Which are the best scores for prediction of severe bleeding after coronary artery bypass surgery?

Antonio Salsano[1], Antonio Nenna[2], Raffaele Barbato[2], Carmelo Dominici[2], Guido M. Olivieri[1], Elena Sportelli[1], Roberto Natali[1], Ambra Miette[1], Federico Soma[1], Giovanni Mariscalco[1], Massimo Chello[2], Francesco Santini[1]

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[2]Division of cardiovascular surgery, Università Campus Bio-Medico di Roma, Roma, Italy

BACKGROUND: Major bleeding after coronary artery bypass surgery(CABG) is an harmful event. Recently new scores for prediction of severe bleeding have been developed.
METHODS: A multicenter observational study included 1391 consecutive patients who underwent isolated CABG from July 2015 to January 2018. In the present study we tested the hypothesis that the WILL-BLEED score, specifically designed for CABG, would perform at least as well as the CRUSADE, PAPWORTH, TRUST, TRACK and ACTION scores in predicting postoperative major bleeding. The primary endpoint was major bleeding after CABG procedure. The main secondary endopoint was in-hospital mortality.
RESULTS: Mean blood losses in the first 12 post-operative hours was 339.75±189.97 mL. 73 (5.2%) subjects underwent administration of blood products and 1.3±1.5 units of red blood cells per patient were transfused. 1.6% of patients required at least one unit of fresh frozen plasma. The rate of severe-massive bleeding according to Universal Definition of Perioperative Bleeding (UDPB grades 3-4) classification was 1.5%. WILL-BLEED (OR 1.212, 95% CI 1.127-1.302, P value<0.001), TRUST (OR 1.481, 95% CI 1.252-1.754, P value<0.001) , TRACK (OR 1.079, 95% CI 1.036-1.122, P value<0.001) and ACTION (OR 1.045, 95% CI 1.007-1.083, P value = 0.018) scores were significantly associated with severe postoperative bleeding. C-index of these four bleeding schemes were 0.658, 0.648, 0.605 and 0.565 respectively. Reclassification analysis showed a worsening in sensitivity and significant negative reclassification of CRUSADE, PAPWORTH and TRACK and ACTION scores when compared with the WILL-BEED, based on Hosmer-Lemeshow test, IDI and NRI values. Overall in-hospital mortality was 1.65%. In-hospital mortality in patients with severe *vs.* no-severe bleeding was found to be 11.8% *vs.* 1.0% (P <0.0001). Severe bleeding (OR: 13.26; P<0.001) was found to be significantly associated with early mortality.
CONCLUSIONS: In our cohort of CABG patients WILL-BLEED and TRUST scores resulted to be superior than the other scores for severe bleeding prediction. Furthermore severe bleeding correlated with early mortality.

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Thoracoscopic left atrial posterior box isolation in patients with long standing persistent atrial fibrillation

Daniil Borisov, Sergei Vachev, Aleksandr Troitskiy, Robert Khabazov

Federal Research Clinical Center, Moscow, Russian Federation

BACKGROUND: This study aimed to evaluate immediate and medium-time efficacy of thoracoscopic left atrial (LA) posterior box isolation and appendage resection in patients with long standing persistent atrial fibrillation (LSP-AF).
METHODS: 62 patients with LSP-AF underwent thoracoscopic LA posterior box isolation and appendage resection (April 2017 – December 2018). Median duration of AF was 25 months (min 18; max 60). We used thoracoscopic ablation device with irrigated electrodes. At our institution we initially perform 10 lesions from each side with 3-5 mm adjustment between ablations. The device is then removed, cleaned and the same side repeated with a downward angulation of the device for 10 more lesions for a total of 20 lesions on each side. LA appendage was resected with a linear cutting stapler.

RESULTS: The procedure was successfully completed in all patients. The mean number of autonomic ganglia ablated was 6.4 (range, 2-9). There was no operative mortality, no myocardial infarction, and no stroke or transient ischemic attack. Two patients required sternotomy and another one survived left anterolateral thoracotomy due to bleeding. One patient required prolonged non-invasive ventilation for transient bilateral phrenic nerve palsy. Right phrenic nerve injury was documented in two patients. Mean follow-up was 10 months (range, 2-18 months). At last follow-up, 61 patients (98.4%) were in sinus rhythm, as documented by 24-hour Holter monitoring. Anticoagulation therapy, beta-blockers and amiodarone were discontinued in 61 patients after routine examination (24-hour Holter monitoring) 3 months after the surgery. 7 days later routine examination was repeated in order to exclude cardiac rhythm disorders. One patient reverted to AF. Sotalol administration and electrical cardioversion were unsuccessful.
CONCLUSIONS: Frequent ablation device positioning change and increased number of applications help to achieve complete LA posterior box isolation, especially in patients with LSP-AF.

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Development of a visualization module for image-based preoperative mitral valve assessment

Alexander Woltersom[1], Joseph Gorman[2], Robert Gorman[2], Alison Pouch[3]

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[2]Gorman Cardiovascular Research Group, University of Pennsylvania, Philadelphia, USA
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BACKGROUND: The role of preoperative heart valve assessment prior to endovascular and surgical treatment has become more profound and accessible throughout the past few years, owing to advancements in 3D transesophageal echocardiographic (TEE) imaging, automated image analytics, as well as the availability of greater computational power at lower costs.This work presents a novel tool for preoperative visualization of image-derived heart valve models that has broad application to personalized surgical planning, especially for heart valve repair.
METHODS: We implemented a visualisation module that generates a video of the structure of interest, such as an image-derived model of a mitral valve, rotating in a standardised manner.The visualization is designed to depict fundamental aspects of the valve, such as 3D annular geometry and detailed leaflet morphology.The module was built using the Blender open source computer graphics toolset. A video functionality offers a comprehensive overview of the valve at the cost of increased computational time, while an image series function allows for a quick preview when quick evaluation is prioritised.
RESULTS: Preoperative heart valve models generated from intraoperative 3D TEE are presented side-by-side with photographs taken intraoperatively before surgical valve repair.Image-derived views of the heart valve complement the intraoperative exam of the arrested heart by providing a qualitative evaluation of the valve in its physiological state immediately before cardiopulmonary bypass.
CONCLUSIONS: The standardised orientation and rotation of the structure of interest in our visualization module allows for easy comparison between the same valves in different studies.The tool can be demonstrated with a range of valve pathologies including mitral valves with functional regurgitation and degenerative disease.It produces visual perspectives of cardiac structures that are not possible to obtain on direct examination or by 3D TEE volume rendering and thereby provides an advanced utility for personalized surgical planning.

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Ten years UK experience in survival for surgical TAVI approaches

Francesca D'Auria[1], Vincenzo Consalvo[1], Matteo Bottigliero[1], Francesco Itri[1], Aung Myat[2], Enrico Coscioni[1], David Hildick-Smith[2]

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[2]Cardiac Center, Brighton, UK

BACKGROUND: Aim of this study is to compare morbidity and mortality (M&M) associated with different surgical TAVI access alternative to the surgical femoral (SF).
METHODS: 2,863 pts underwent surgical TAVI from Jan 2007 to Jan 2017 in the 33 UK TAVI Centers. Primary outcome is long-term survival up to Jul 2017. Secondary outcomes are procedural/in-hospital (in-H) complications (stroke, major vascular complications, bleeding, tamponade, permanent PMK, and renal replacement therapy), in-H, 30-day, and 1-year mortality. Statistical analysis by SPSS 20.0 (IBM Corporation, NY). P value <0.001 is significant.
RESULTS: In-H mortality lowest in SF. Among the no-SF, only SC not significantly different from SF, whereas TA and DA associated with higher mortality. Unadjusted Kaplan-Meier showed long-term survival greater in SC than DA and TA. No difference in survival between TA and DA, both of which with lower long-term survival than SF. Unadjusted survival rate of the surgical SC cohort not different from SF. Hemofiltration most common in AD and TA compared to SC and SF. Permanent PMK greater in SC and SF than in TA and DA. Average hospitalization reduced in SF and SC compared to TA and DA. A comparison of M&M in the two quarters 2007-2011 *vs.* 2012-2017 carried out. For each secondary outcome variable, marked improvement over the second 5-years compared to the first one.
CONCLUSIONS: This is the largest study to compare survival in surgical TAVI access routes using a large dataset retrieved from the UK TAVI registry. TA and DA were associated with almost similar survival, both lower than after SC and SF. SC is the only non-SF approach for which survival was not different from SF. It may represent the safest non-femoral access route for TAVI and it is the safest surgical route until now experienced.

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Long-term follow-up of 111 minimally-invasive left ventricular assist device implantations: a single centre experience

Silvia Mariani, Jasmin S. Hanke, Günes Dogan, Anamika Chatterjee, Regina M. Wendl, Christina Feldmann, Axel Haverich, Jan D. Schmitto

Medical School Hannover, Hannover, Germany

BACKGROUND: Heart failure is one of the rising problems in the contemporary society with an estimated growing rate of 46% from 2012 to 2030. Left Ventricular Assist Devices (LVAD) and minimally invasive techniques are becoming key therapies, beside heart transplants, to guarantee equal access to optimal treatments for every HF patient. So far, clinical experience with minimally-invasive LVAD surgery showed promising short-term results. The aim of this study is to evaluate the long-term results of the first series of patients who received minimally-invasive LVAD surgery at a single institution.
METHODS: We reviewed the survival-outcome of 111 end-stage heart failure patients who underwent LVAD implantation (HVAD, HeartWare) in our institution between 2011 and 2014. All Patients were operated using an upper hemisternotomy and left-sided anterolateral thoracotomy with cardiopulmonary bypass.
RESULTS: Between 2011 and 2014, 111 minimally-invasive LVAD implantations were performed at our institution (78% male, 22% female;

mean age 52 ± 4; dilated cardiomyopathy 42.6%; ischaemic cardiomyopathy 44.4%, other aetiologies 13%). Postoperative bleeding incidence was 9.6% leading to a low amount of applied packed red blood cells (mean: 4.9 rbc), short ICU stay (mean 9.3 days), and a low incidence of right heart failure (4.6%). Thirty-day mortality was 5.2%, 90-day mortality 9.0% and 1-year survival 88%. Long-term follow-up (median 6.4 years) demonstrated a mortality of 51,4%, a transplant rate of 16.4%, and an explant rate of 1,7%. 15.8% of patients underwent pump exchange and 30,3% of patients had still an ongoing LVAD therapy at the time of follow-up.
CONCLUSIONS: Minimally-invasive LVAD implantations are proven to be safe and associated with a lower perioperative complication and mortality rate. By using this technique (upper hemisternotomy plus anterolateral thoracotomy) the intra-hospital outcome was significantly improved impacting also the long-term follow-up which showed an excellent percentage of ongoing LVAD therapies.

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Minimally invasive surgery for adult patients with congenital heart disease: the dutch experience

Maurits Zegel[1], Robin E.P. Theunissen[1], Pieter C. van de Woestijne[2], Sara C. Arrigoni[1]

[1]University Medical Center of Groningen, Groningen, The Netherlands
[2] Erasmus Medical Center, Rotterdam, The Netherlands

BACKGROUND: Since 2010 minimally invasive surgery for congenital heart defects have been used in the Netherlands. With a limited thoracotomy, this technique offers an alternative to conventional sternotomy. However, results of the Netherlands have not yet been described. In this study we describe the results of this technique.
METHODS: All adult patients who underwent minimally invasive surgical correction of congenital heart defects in the University Medical Center of Groningen and in the Erasmus Medical Center of Rotterdam from August 2010 until August 2018 have been included. Patient characteristics, operation, hospital-stay and follow-up were retrospectively collected.
RESULTS: Seventy-eight patients were included, mean age was 37,4 years (range 18,0 – 73,0) with mean weight of 71,6 kg (range 53 – 117). Fifty-eight (73%) patients underwent ASD closure, other patients underwent correction of more complex congenital defects. Four patients required conversion to sternotomy. Conversion was needed due to lung adhesions, complexity of operation or because of small femoral artery. Thirty (38%) patients were extubated at the OR. Seventy-six (95%) patients were discharged from the ICU ≤24 hours. There was no in-hospital and follow-up mortality. Five patients needed re-operation; two times because of recurrent ASD, once because of bleeding, once due to cardiac tamponade and once due to lung herniation. Six patients developed a complication related to groin perfusion. There was no mortality during follow-up.
CONCLUSIONS: Minimally invasive surgery offers a safe alternative for correction of congenital heart defects in adult patients. Compared to conventional sternotomy this technique provides earlier extubation and improved cosmetic outcomes.

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Midterm valve stability after valve sparing aortic root replacement: bicuspid aortic and tricuspid valve comparison

Lionel Camilleri, Adama Sawadogo, Céline Lambert, Etienne Geoffroy, Nicolas Dauphin, Vedat Eljezi, Guillaume Clerfond, Nicolas D'Ostrevy

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BACKGROUND: Bicuspid aortic root pathology is typically accompanied by valve abnormalities that requires repair during valve sparing root replacement (VSRR). Valve stability following VSRR, were comparatively analyzed in between tricuspid aortic (T) and bicuspid (B) aortic valves using clinical and echocardiographic examination.
METHODS: From 2003 to 2018, 140 consecutive patients (37 B and 103 T) underwent VSRR surgery. Mean age was 56.3 ± 3 years (b:48.5 ± 11.6; T: 59.1 ± 11.8). Mean NYHA Class was 1.6 ± 0.6 (B: 1.4 ± 0.5; T: 1.7 ±0.7). B had presented grade III or IV aortic regurgitation (AR) in 38 % versus 58 % of T. Mean left ventricular ejection fraction (LVEF) was 61.6 % ± 7.8 for B versus 61.0 % ± 9.0 for T. Leaflet repair was performed in all B versus 73 % of T. Patients were yearly followed by referent cardiologists. Follow-up was 96 % complete with an average mean duration of 5.02 years (range: 6 months – 14.3 years).
RESULTS: In-hospital mortality was nil in B and 2% in T. On midterm, there were no clinical and echocardiographic differences in the two groups: all B and T presented NYHA class I or II, mean LVEF was 65 % in B and 60.3 % in T; no patient in both groups presented AR > grade 2 and mean gradient was 9 and 4 mm Hg respectively for B and T. There were 14 late deaths (10%) including 2 B and 12 T. Four T patients were re-operated: Bentall 2, TAVI 1 and mitral valve repair 1. Late major complications were reported in 4 patients (B 1; T: 3).
CONCLUSIONS: VSRR ensures long-term stability of aortic valve function independently to its morphology. In BAV associated with aortic root aneurysm, leaflet repair does not increase the valve-related events.

Thursday May 23, 2019
08:00 – 09:30

Cardiac Abstract Session I: Coronary Revascularization

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Coronary artery bypass grafting in patients with cardiogenic shock

Oliver J. Liakopoulos[1], Georg Schlachtenberger[1], Daniel Wendt[2], Henryk Welp[3], Sven Martens[3], Wolfgang Schiller[4], Armin Welz[4], Heinz Jakob[5], Thrösten Wahlers[1], Matthias Thielmann[2]

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BACKGROUND: Coronary artery bypass grafting (CABG) in patients with foracute coronary syndrome (ACS) and cardiogenic shock is associated to a high mortality. We analyzed operative surgical outcomes of CS patients based on the data of a multicenter prospective surgical registry.
METHODS: A total of 1836 patients with ACS (NSTEMI N.=1218; STEMI N.=618) referred for surgical revascularization were into a prospective multicenter registry. Cardiogenic shock was present in 19% of patients with NSTEMI and 39% of STEMI patients. Clinical endpoints were hospital mortality (HM) and major adverse events (MACE) and predictor were analyzed with logistic regression analysis.

RESULTS: STEMI patients withcardiogenic shock were younger (66±11 *vs.* 68±10years), had less diabetes (21% *vs.* 38%) and multivessel disease (73% *vs.* 86%), higher myocardial injury (troponin I 9±17vs 3±6 ng/mL) and moreemergency surgery (58% *vs.* 40%, P<0.05 for all compared to NSTEMI). Hospital mortality was higher in STEMI patients with CS when compared to NSTEMI (24% *vs.* 15%; P<0.001). Similarly MACE rates were increased in STEMI patients (49% *vs.* 34%; P<0.001 *vs.* NSTEMI). Predictors for HM and MACCE in patients with cardiogenic shock were a reduced EF, a higher EuroSCORE and the number of grafts.
CONCLUSIONS: Surgical revascularization in ACS patients with CS is associated to high HM and MACE with poorer outcomes in STEMI patients.

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Long-term outcomes of syntax score impact on coronary artery bypass grafting for coronary artery disease

Mehmet Aksut

Kartal Kosuyolu Yuksek Ihtisas Research and Training Hospital, Istanbul, Turkey

BACKGROUND: We retrospectively assessed long-term outcomes of standard coronary artery bypass grafting (CABG), routinely applied for complex coronary artery disease among the patients with low (0-22), intermediate (23-32), and high (≥33) SYNTAX scores.
METHODS: 3564 consecutive patients with stable left main and/or three-vessel disease who routinely underwent CABG from 2010 through 2013 recruited to our study. Comparison within the three groups (low score, N.=1449; intermediate score, N.=1341; high score, N.=774) was operated, searched for the major adverse cardiac and cerebrovascular events (MACCE) as a primary endpoint, including all-cause mortality, stroke, myocardial infarction (MI), and re-revascularization. We also assessed the impacts of variables on MACCE at 5 years after the surgery.
RESULTS: The overall 5-year MACCE rates in patients with low, intermediate, and high SYNTAX scores were 23.4%, 34.1%, and 49.0%, respectively (P=0.004). This was largely because of an increased rate of the need of re-revascularization at 5 years (4.2% in low, 16.9% in intermediate, and 18.7% in a high score, P=0.001). The cumulative rates of the combined outcomes of death/stroke/MI in patients with low, intermediate, and high SYNTAX scores were 23.1%, 24.9%, and 35.8%, respectively (P=0.17). In the multivariate analysis, the SYNTAX score was showed to be the significant predictor of MACCE at 5 years and repeat revascularization at 5 years (P=0.007).
CONCLUSIONS: The SYNTAX score is a predictor of long-term outcome after standard CABG for complex coronary disease. Our results recommend that patients with lower SYNTAX scores, who are a candidate for percutaneous coronary intervention (PCI), should refer to CABG for better MACCE and repeat revascularization.

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Improvement of myocardial activity after off pump coronary artery bypass grafting assessed by speckle tracking

Francesca D'Auria, Vincenzo Consalvo, Matteo Bottigliero, Francesco Itri, Enrico Coscioni

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BACKGROUND: Longitudinal strain (LS) is an echocardiographic method for measuring regional and global deformation of the myocardium. LS displays and measures the simultaneous function of the different myocardial segments, describing changes in shape and dimensions of the left ventricle (LV). LS was chosen to investigate changes in myocardial function after off-pump coronary artery bypass grafting (OPCABG) in order to verify the accuracy of this technique compared to the ejection fraction (EF) and to the segmental kinetics (SK) of the LV.
METHODS: From January 2018 to December 2018, [160 patients (48 f - 112 m), mean age 66.2 +/- 4.7, (major cardiovascular risk factors: 39% diabetes type II, 100% hypertension, 49% smoke, 44% COPD, 64% obesity, 10% previously PCI), (LVEF 50% or greater, mean NYHA II, mean CCS 3, mean Euroscore II 2.38+/-1.28, mean Syntax score 29 +/-3.2)] were enrolled and underwent complete OPCABG. 2D TTE and LS were performed: the day before, 3 months, and 6 months after OPCABG. The time for LS was also compared to EF and SK.
RESULTS: Follow-up (FU) is 100% completed. LS, LVEF, left ventricular end-diastolic dimension (LVEDD), and stroke volume (SV) were significantly improved 6 months after OPCABG (P<0.05). Significant correlation was found between coronary lesions, which were detected by the angiogram, and the corresponding heart zone impairments, which were shown by reduction in global and segmental LS (P<0.05). Not significant correlation between angiographic lesion and EF, LVD, and LVV (P>0.05). LS marginally longer to perform compared to EF and SK.
CONCLUSIONS: LS is more effective than LVEF, LVD, and LVV for monitoring improvement in myocardial function after OPCABG. LS could also guide the revascularization strategy because it significantly correlates with the coronary lesions.

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Vein-grafts selective cardioplegia and reperfusion enhance early recovery in patients with LV depression undergoing CABG

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BACKGROUND: On-pump aortic cross-clamp and antegrade root cardioplegia (ARC) remains the most popular strategy for myocardial protection during coronary artery bypass graft (CABG). In patients with left ventricle depression, especially when a severe left main and/or multiple coronary stenosis are showed, however, alternative strategies could enhance early post cardiopulmonary bypass recovery. Here we analyzed the results of our strategy of adding selective antegrade cardioplegia (SAC) and total antegrade warm reperfusion (TAWR) to standard ARC in enhancing post-operative recovery in patients with LV depression undergoing CABG.
METHODS: Out of 88 patients underwent CABG using SAC and TAWR strategy (including antegrade selective cardioplegia through each vein graft and, once the distal anastomosis were completed, warm total reperfusion through the mammary artery and all vein grafts until all top end anastomosis were completed), 28 patients presented with depressed LV function (EF<40%) and multi vessel coronary diseases requiring >2 vein grafts. Spontaneous rhythm recovery, inotropic support, cardiac enzyme peak and postoperative LV recovery were analyzed and compared (by mean of propensity score analysis) to 28 patients operated on using standard ARC.
RESULTS: No patient died. 26 patients (92%) of SAC-TAWR group presented spontaneous recovery of idiophatic rhythm compared to 18 (64%) of ARC group (P=0.009). Only 2 patients of SAC-TAWR group (7%) needed DC cardioversion compared to 10 (35%) of ARC group (P=0.009). Prolonged (>72 hours) inotropic support was needed in 6

patients (21%) of SAC-TAWR group compared to 13 (46%) of ARC group (P=0.048). Peak postoperative TNI was not significantly different between two groups but first postoperative TNI value was slightly higher in ARC group (P=0.048).
CONCLUSIONS: Selective graft cardioplegia and antegrade total reperfusion seems to significantly enhance early postoperative cardiac recovery in patients with left ventricle depression undergoing multi vessels CABG when compared to standard root alone antegrade cardioplegia.

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Intraoperative transit-time flow measurement in CABG: Insights from the REgistry for QUality assESsmenT (REQUEST) study

Daniel Wendt, Daniel Thuijs, Teresa Kieser, Gabriele Di Giammarco, Gregory Trachiotis, John Puskas, Pieter Kappetein, Stuart Head, David Taggart
Westgerman Heart and Vascular Center, ESSEN, Germany

BACKGROUND: ESC/EACTS guidelines on myocardial revascularization recommend that 'Routine intraoperative graft flow measurement should be considered' and 'Minimization of aortic manipulation is recommended'. We undertook a large prospective registry (REQUEST) to determine how frequently routine high frequency ultrasound (HFUS) assessment of the ascending aorta, native coronary artery and conduits and transit time flowmetry (TTFM) of graft flow led to changes in surgical strategy.
METHODS: Between 04/2015 and 12/2017, 1016 patients undergoing CABG in 4 European and 3 North American centres were prospectively enrolled into the REQUEST registry. The primary endpoint was any change in the planned surgical procedure. Major secondary endpoints consisted of the rate and reason for any surgical change related to the aorta, conduits, coronary targets, completed grafts and anastomotic revisions, and the rates of in-hospital mortality and major morbidity.
RESULTS: The mean patient age was 65.9 years, 14.0% were female and diabetes was present in 39.6%. Off-pump procedures were performed in 40.1% and bilateral internal thoracic arteries were used in 30.5%. The primary endpoint occurred in 25.3% (257/1016) of patients. Changes in surgical strategy were related to the aorta in 10.0%, conduits in 2.7%, and coronary targets in 22.4%. Graft revision occurred in 8.3% of patients, including anastomotic revisions in 7.8%. In-hospital adverse event rates were 0.6% for mortality, 1.0% for stroke or transient ischemic attack, 0.3% for myocardial infarction and 0.1% for repeat revascularization.
CONCLUSIONS: In the prospective, multicenter REQUEST study, surgical changes related to the aorta, conduits or coronary targets, and graft revisions were made in a quarter of all patients. This was associated with low operative mortality and major morbidity. By objectively guiding changes in the proposed CABG procedure, intraoperative combined assessment with TTFM and HFUS can improve the quality, safety and efficacy of CABG and should be considered as a routine procedural aspect.

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Long-term results of bilateral internal thoracic artery garfting versus standard approach in coronary surgery

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BACKGROUND: One of the big questions of cardiac surgery is which method of myocardial revascularization is the best. In spite of the last data yet some centers represent that bilateral internal thoracic artery (BITA) grafting has advantage, others prove that there are no significant differences. We aimed in our region also to evaluate the long-term results of BITA grafting.
METHODS: We performed analysis of 571 patients who underwent on/off-pump CABG. According to the usage of one (SITA-V) or two (BITA-V) internal thoracic artery plus venous conduits all patients were divided into two groups. The first one included 270 (47.2%) patients, the second – 301 (52.8%). The average observation period was 6.5±3.1 years. All patients were comparable in most preoperative parameters and half of them (49.9%) underwent postoperative angiography. Long-term results were assessed, including MACCE, class of angina and ejection fraction of the left ventricle (EFLV).
RESULTS: There were no significant differences in MACCE. The class of angina in long-term postoperative period was 2,6±0,5 in SITA-V and 2,4±0,6 in BITA-V (P=0.000), EFLV was 53,2±10,4% and 55±8,4% (P=0.035). Postoperative angiography had no differences for LAD, DB, OM, but for Cx stenosis was 87,9±13,8% and 82±15,6% (P=0.009), RCA was 95,7±6,9% and 87,6±16,3% (P=0.000). Case of LITA occlusion was 19 (7%) in SITA-V and 7 (2,3%) in BITA-V (P=0.001), respectively.
CONCLUSIONS: It was proved that the usage of BITA grafting is comparable with the standard CABG in the MACCE, especially in according to the last trials. However, Group-BITA-V demonstrates better characteristics both native coronary artery and conduits patency, improves EFLV and decreases functional class of angina. These data could indicate that the more arterial conduits are used, the more preventive effect of atherosclerotic progression in the native coronary arteries is. Further investigations are needed.

Thursday May 23, 2019
08:00 – 09:30

Vascular Abstract Session I: Veins

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Distribution patterns of primary superficial venous insufficiency: latent class analysis application in a cross-sectional study

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BACKGROUND: Doppler ultrasonography enables mapping of primary venous insufficiency in patients presenting with venous reflux symptoms. Latent class analysis identifies unseen, or latent, subgroups within a population using responses from a set of variables, such as whether a given venous segment is refluxing in a particular patient. Aim of this study is to determine specific anatomic distribution patterns of primary venous insufficiency using this novel statistical tool for analysis of venous studies.
METHODS: A total of 1218 patients with symptoms of superficial venous insufficiency referred for Doppler examination within a period from 2009 to 2018 were included. Refluxing superficial venous segments of a total of 1871 lower extremities were sonographically mapped and recorded in database as 10 distinct anatomic locations: Saphenofemoral junction, mid and distal thigh greater saphenous vein (GSV),

anterior and posterior accessory saphenous veins (AASV and PASV), proximal and distal calf GSV, saphenopopliteal junction, mid-calf lesser saphenous vein (LSV) and intersaphenous veins including Giacomini's. All patients were treatment-naive and any repeat examinations were excluded. Patient age (range 21 to 87) and gender (56% female) were the only concomitant variables. Latent class analysis was applied to reveal any possible anatomic distribution patterns of venous insufficiency.
RESULTS: Bayesian information criteria revealed a three latent class model fit for refluxing segment distribution: 58.2% (N.=1089) were above-the-knee GSV segments including saphenofemoral junction (pattern 1); 29.3% (N.=548) were below-the-knee GSV segments (pattern 2); and 12.5% (N.=234) were LSV segments and intersaphenous veins including Giacomini's (pattern 3). There was no gender or age-specific differences in venous reflux distribution patterns.
CONCLUSIONS: Identification of three distinct classes of anatomic distribution of refluxing veins improves understanding the course of superficial venous insufficiency. Recognizing such latent patterns may provide a useful basis for understanding differing pathophysiological etiology of venous reflux and planning interventions accordingly.

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Prevalence and risk factors of chronic venous disease of lower limbs in Thai female workers

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BACKGROUND: The aim of this study is to evaluate the etiology and prevalence of venous disease of the lower limb in workers, and to identify some risk factors using a detailed questionnaire and interview.
METHODS: This cross-sectional survey study was carried out in 2 groups of female workers from factories and nurses, aged 18-60 years, an interviewer administered a questionnaire and examination assessed risk factor for venous disease.
RESULTS: The overall prevalence of chronic venous disease was 38%; 25.5% in factory workers group and 85.7% in nurses group. Most clinical manifestation was venous symptom and appearance of varicose vein. Comparing between 2 group, working hours and standing hours were longer in nurses. The most associated risk factor was prolonged standing that following with BMI and family history of venous disease.
CONCLUSIONS: Chronic venous disease of lower limbs occurs very commonly in female working-aged population. This study shows that occupational factors such as prolonged standing play an important role in the symptomatic disease. Attention should be provided to female workers for risk-factor modification to prevention, to use early therapeutic measures in view of morbidity as a consequence of venous disease, of the high social costs and disturbance of quality of life.

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A new perspective of oral anticoagulation; new generation anticoagulation therapy

Bortecin Eygi

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BACKGROUND: Oral anticoagulant treatment with warfarin has been the main therapy for acute and recurrent deep venous thrombosis. Low molecular weight heparin has been the other option for patients who have malignancy or warfarin discordance. Now, we have another option for oral anticoagulant treatment. With rivaroxaban (factor Xa inhibitor) and dabigatran (direct thrombin inhibitor) patients do not need any monitorization to determine blood anticoagulation level and these properties facilitated their use in daily practice. In this study we present our new generation anticoagulation therapy experiences in our outpatient clinic.
METHODS: Between January 2018 and January 2019, patients who needed to oral anticoagulant therapy due to deep venous thrombosis were retrospectively reviewed. Age, gender, prescribed anticoagulant therapy and patients with thrombotic diseases or patients with recurrent deep venous thrombosis were investigated.
RESULTS: In one year period, 110 patients needed oral anticoagulant therapy. There were 62 female (56%) and 48 male (44%) patients. Mean age was 52,6 (min:25, max:75). Rivaroxaban, dabigatran and warfarin were used in 34 (31%), 12 (11%) and 64 (58%) patients, respectively. 24 (22%) patients did not have thrombotic disease or recurrent deep venous thrombosis and they had dabigatran or rivaroxaban treatment as a first line treatment. 22 (20%) patients with thrombotic disease and recurrent deep venous thrombosis had dabigatran or rivaroxaban treatment.
CONCLUSIONS: Warfarin was the only option for oral anticoagulation in past. The necessity of hospital admissions for warfarin dose adjustment and patient-related factors complicating dose adjustment made it use difficult on the long term. Now, we have dabigatran and rivaroxaban treatment which tremendously improved patient compliance and admission costs.

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Possibilities of duplex ultrasound scanning in diagnostics of microcirculatory disorders in patients with varicose disease

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BACKGROUND: To assess the possibilities of routine duplex ultrasound scanning (DUS) in evaluation of microcirculation in subjects with varicose disease.
METHODS: The study included 195 subjects with varicose disease. Distribution of the patients according to the CEAP clinical classification of chronic venous disorders was as follows: 78 subjects – clinical class C2, 39 subjects - C3, 52 subjects - C4, 26 subjects – C5/C6. The study was performed using a Medison SonoaceX8 scanner. Anatomy and function of the superficial, deep, and perforator veins were determined. Blood flow velocity and resistive indexes were assessed in the perforator bundle arteries.
RESULTS: The most frequently encountered perforator veins were those localized on the medial surface in the distal part of the lower leg. Assessment of blood flow parameters in perforator bundle arteries revealed low resistive indexes, which were accompanied by normal systolic peak and high diastolic velocities. In addition, pseudopulsating flow was detected in 50% of perforator veins. According to the DUS criteria, these were direct signs of arteriolovenular shunting. Statistical analysis revealed significant differences in this parameter between the patients with CEAP classes C2 and C3, C3 and C4 ($P < 0.05$). Analysis of the parameters of the blood flow through the perforator vessels has revealed that there were ultrasound signs of the presence of arteriolovenular shunting in areas of trophic changes, which may require appropriate therapies. Moreover, initial signs of arteriolovenular shunting were detected in patients with edema, *i.e.* no trophic changes.
CONCLUSIONS: changes in the microcirculation in subjects with vari-

cose disease begin at clinical class C3 according to CEAP classification. Routine duplex ultrasound scanners may be useful in assessing microcirculation in patients with trophic changes due to varicose disease.

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Different modalities for management of primary varicose veins in females: is long term followup important

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BACKGROUND: A-three year prospective study analyzed presentation, etiology, management and long-term outcome of primary non-complicated great saphenous vein varicosities in females. The objective of this the current study was to assess the results of long-term follow-up of different modalities for the management of primary uncomplicated lower limb female varicosities.
METHODS: A prospective study took place in 80 females within a three-year period from June 2010 until May 2012. The suitable candidates were classified into three main groups; group I incorporated those who underwent open surgical treatment. Group II included those who subjected to ultrasound-guided foam sclerotherapy (USGFS). While group III included those patients who were treated with endovenous laser therapy (EVLT).
RESULTS: The success rate for great saphenous vein ablation was greater in the surgically treated patients compared to those treated with USGFS (P=0.003). There is a significant success rate for those group treated with EVLT over those group treated with USGFS (P=0.023). On the other hand, there was an equal result for EVLT treated group and those group who were treated surgically (P=0.85). Early postoperative complications were recorded in 15% of patients ranged from a subcutaneous hematoma in 5%, mild wound infection in 3.75%, allergic reaction in 3.75%, and deep vein thrombosis in one patient (1.25%). Recurrent varicosities were observed in long-term follow-up in 8.5% in group I, 36% in group II, and 10% in group III.
CONCLUSIONS: Long-term follow-up of different modalities for treatment of primary great saphenous vein varicosities revealed that both the standard surgery and EVLT were more efficient than UGFS in ablating the GSV within 6 years of follow-up. UGFS has been associated with a significant rate of GSV reflux. In addition, it is important to elucidate the post-treatment complications, especially those who underwent ultrasound-guided foam sclerotherapy.

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An exceptional complication after radiofrequency varicose vein surgery: guide wire migration

Didier Adodo, Thierry Folliguet

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BACKGROUND: Persistence or even migration of foreign objects after varicose vein surgery is an exceptional and un-feared complication. Here we present a patient in whom metallic foreign materials were detected more than two years after radiofrequency varicose vein surgery.
METHODS: A 39-year-old woman was admitted to the emergency department for left buttock pain since December 2018, associated with thoracoabdominal tingling and palpitations. She had a history of radiofrequency treatment for varicose veins in the lower limbs two and a half years ago which was followed by sclerotherapy for the same varicose veins in December 2018.
RESULTS: On clinical examination, there was a painful, irregular induration of the left buttock in a well-conscious, eupneic and tachycardic patient. The CT Angiography showed a linear metallic foreign object, approximately 45cm long extending from the inferior vena cava (IVC) to the left internal iliac vein with extravascular extension to the gluteal muscles and left subcutaneous gluteal region. Multiple metal fragments were also noted in the right heart chambers and in the segmental branches of the pulmonary arteries; associated with pericardial effusion. She was initially supported in interventional radiology. The IVC guide was removed by endovascular Lasso technique. Then, by median sternotomy and extracorporeal circulation, the fragments of the right heart chambers were extirpated. The postoperative course was simple.
CONCLUSIONS: Endovenous and ambulatory treatments have upset the surgical management of varicose veins in the lower limbs. Early and continuous post-procedural follow-up is essential to detect and treat complications.

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Endoscopic versus open saphenous vein graft harvest for lower extremity femoro-popliteal bypass

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OBJECTIVE: Endoscopic vein harvest (EVH) for infrainguinal bypass lowers the incidence of surgical site infections (SSIs), but generates conflicting patency results. The purpose of this study was to compare outcomes between EVH and open vein harvest (OVH) in femoral to popliteal artery bypasses (FPB).
METHODS: This prospective case-control study compared two groups of patients (EVH = 25, OVH = 25) undergoing FPB with single-segment great saphenous vein between April 2012 and April 2017. Patency and postoperative complications were compared.
RESULTS: There was no significant difference between the groups in terms of demographics, comorbidities, and preoperative Rutherford classification. There were 12 above- and 13 below-knee FPBs in both groups. Mean follow-up was 31.6 months for EVH and 24.7 months for OVH group [P=.123]. SSI rates were higher in the OVH group (EVH 16.0%; OVH 40%; P=.114), with no SSIs occurring at the distal anastomotic site in the EVH group (EVH 0%; OVH 8.0%) and just one SSI at the harvest incision site in the EVH group (EVH 4.0%; OVH 16.0%). There were 4 reinterventions in 4 patients in both groups. 3 of them were endovascular in each group. They were aimed at the body of the graft and its anastomoses in EVH group versus inflow and outflow arteries in OVH group. 36-month patency rates (EVH *vs.* OVH; primary patency 80.5% *vs.* 81.2% [P=.892]; assisted primary patency 96.0% *vs.* 93.3% [P=.919]; secondary patency 94.7% *vs.* 93.3% [P=.799] and limb salvage rates (100.0% *vs.* 100.0%[P=1.00]) were similar in both groups.
CONCLUSIONS: Patency rates of FPBs done using EVH technique are comparable to those achieved using OVH technique. EVH decreases the rate of SSIs, especially those encountered at the vein harvest and distal anastomotic incision sites. Reintervention rate of EVH FPBs is in line with OVH FPBs, but reinterventions are more commonly done on the body of the graft and its anastomoses.

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New technique for the treatment of chronic venous occlusions

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BACKGROUND: Central venous stenosis is one of the key problems causing dysfunction of arteriovenous fistula. Angioplasty and stenting cause secondary stenosis in 55-70% cases, which requires reinterventions. In some cases second no further endovascular intervention is possible inducing search for noval solutions. The aim is to present the first experience of using the Surfacer device in order to overcome multiple central vein occlusions with subsequently implant of dialysis catheter or HeRO Graft.
METHODS: In the vascular surgery department of Cologne (Germany), 9 interventions were performed using the Surfacer device (Merit Medical Systems) during November 2016 to August 2018.
The Surfacer System is inserted through the femoral vein and navigated by X-ray to an exit point in the right supraclavical region. Of the 9 patients, only 4 patients were analyzed, because 5 other patients data are used in the register of the international prospective multi-center study. Of the 4 patients three were women. The average age was 54 y. (29-81 years). All patients preliminarily received multiple interventions to treat central venous stenosis.
RESULTS: Occlusion of the superior vena cava was observed in all 4 patients. Interventions were successful in all 4 patients (100%). There were no intraoperative complications. The mean duration of the procedure was 102 (41-202) minutes (with catheter or HeRO graft implantation). After overcoming chronic occlusion of the superior vena cava three dialysis catheters and one HeRO graft were successfully implanted in all patients. There were no postoperative morbidity and mortality.
CONCLUSIONS: Using the Surfacer device is an advanced and highly effective method to treat multiple chronic central venous occlusions providing patients with permanent vascular access.

Thursday May 23, 2019
08:00 – 09:30

Vascular Abstracts Session 2: Thoracic Aorta & Dissection

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Total arch debranching and endovascular repair in treatment of challenging thoracic aortic aneurysm

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BACKGROUND: Because of significant risk of perioperative morbidity and mortality, open repair of aortic arch aneurysm and descending thoracic aortic aneurysm that extend proximally involving aortic arch is reserved only for selected cases. A hybrid approach with total aortic arch debranching followed by thoracic endovascular aortic repair (TEVAR) has been used to treat high-risk patients and therefore allow repair in this patient cohort more patients. The aim of this work was to present our single center experience with zone 0 hybrid procedure.
METHODS: Seven consecutive patients, with an age range of 60–75 years, who underwent hybrid procedure with total aortic arch debranching between January 2012 and December 2018 were retrospectively reviewed. Debranching of the all three supraaortic vessels with bypass grafting from the ascending aorta was performed through median sternotomy. In one case dilated ascending aorta was previosly wrapped with a polypropylene mesh. TEVAR with endograft landing in zone 0 was preformed as a second procedure. Demographic characteristic (sex and age), baseline comorbidities, procedure details and postoperative complications were recorded.
RESULTS: Technical success of the endografting was achieved in all cases. The median length of hospital stay was 21 days (range 15-32 days). In-hospital mortality was 14% (one patient) due to deep sternal wound infection. There were no cases with a postoperative stroke, retrograde aortic dissection or spinal cord ischemia. The most common early complications included pneumonia (two cases), sternal wound infection (three cases), pleural effusion (one case).
CONCLUSIONS: According to our results total arch debranching and subsequent TEVAR in patients at high risk for open repair has acceptable results in terms of technical success, morbidity and mortality rates.

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Endovascular repair of aortic arch branch pathologies

Petroula Nana[1], Georgios Kouvelos[1], Georgios Psarras[1], Konstantinos Spanos[1], Nikolaos Rousas[1], Eleni Arnaoutoglou[2], Athanasios Giannoukas[1], Miltiadis Matsagkas[1]

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BACKGROUND: Endovascular repair for several pathologies of the aortic arch branches seems to provide a sufficient minimally invasive approach with low morbidity and mortality. The aim of this study was to analyze our results using the endovascular approach as the first line option.
METHODS: During a two-year period, nine patients (mean age 75, range 43-91 years, 2 females), with acute or chronic pathologies of the supra-aortic vessels were treated by endovascular means. Six patients were symptomatic. Three of them suffered from subclavian (2) or innominate stenosis (1). A female patient presented with common carotid artery ulcer, while two patients presented with upper limb hematoma due to iatrogenic trauma of the left subclavian artery. In all three asymptomatic patients, a common carotid artery severe stenosis was found incidentally during the workflow for internal carotid artery disease. In all cases, computed tomography angiography set the diagnosis.
RESULTS: All patients were treated with 9 covered stent-grafts and one uncovered stent. The technical success was 100%. No stroke or transient ischemic attack was recorded intra-operatively. The early (30-days) morbidity and mortality rate was null. The median postoperative hospital stay was 2 days (range 1-4). During a follow-up period of 13 months (range 3-24 months), patency rate was 100%, with no re-intervention needed. No other complication or death was recorded during that period.
CONCLUSIONS: Endovascular treatment of supra-aortic vessels pathologies seems to be safe with good mid-term results in terms of morbidity and mortality. A larger number of patients with longer follow-up could verify those outcomes and the absence of any re-intervention need.

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Axillary-carotid bypass with TEVAR for complex arch disease - Traditional method to solve difficult problem

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BACKGROUND: Thoracic endovascular aortic replacement (TEVAR) has become a routine treatment for aortic disease, and TEVAR surgery involving the arch needs to consider the treatment of the supra-arch vessels. This article will retrospectively analyze the technique of a single center using axillary-carotid bypass method to preserve the landing zone for preserving the supra-arch vessels.
METHODS: From January 2015 to December 2018, 285 patients with aortic disease (dissection, aneurysm) were treated using TEVAR in our center. 65 patients (22.8%) were involving the aortic arch. Among them, 42 cases (64.6%) with axillary-carotid bypass, 3 cases (4.6%) with debranch, 2 cases (3.1%) with chimney method, and 14 cases (21.5%) with physician-modified fenestrated stent technique. Retrospective statistical analysis of the clinical features, technical methods and follow-up results of patients with axillary-carotid bypass method.
RESULTS: The patient's lesion type included 28 cases of aortic dissection, 9 cases of penetrating ulcer, and 5 cases of aortic aneurysm. There were 11 cases involving Zone-2 and 31 cases involving Zone-3. No deaths, the technical success rate is 100%. There was no perioperative stroke or paraplegia. The average follow-up was 14 months, and the CT bypass artificial blood vessels were followed up for follow-up.
CONCLUSIONS: The n axillary-carotid bypass method is simple and the technical success rate is high. Although the trauma is increased, there is no additional increase in mortality and complication rates. It can be used as a technical method to preserve the supra-arch vessels in TEVAR surgery.

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Outcomes of left subclavian artery coverage by STENTGRAFT with and without revascularization single centre experience

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BACKGROUND: Endovascular aortic repair has a significant role in the treatment of aortic descending pathology. The left subclavian artery (LSA) forms the first and most often encountered supra-aortic vessel when treating descending aortic pathology. The LSA provides blood flow to the (posterior) brain, the spinal cord and the left arm, therefore acute covering of the origin of the LSA by a stentgraft might cause malperfusion of the aforementioned regions. Revascularization can be achieved by a surgical bypass or transposition of the LSA, or by preservation of antegrade LSA flow by endovascular options, for example scalloped stentgrafts. In patients with an anticipated risk of malperfusion of the brain, spinal cord or left arm, based on the left vertebral artery dominance and/or previous of aortic surgery, we prefer to revascularize the LSA. This study was conducted to evaluate the neurological and left arm (mal)perfusion outcome differences between patients with and without LSA revascularization in case of zone 2 thoracic endovascular aortic repair (TEVAR).
METHODS: We identified 94 consecutive patients with concomitant selective LSA revascularization, and 104 patients with simple coverage by the stentgraft. Data was analysed retrospectively.
RESULTS: No significant differences were found in the baseline characteristics. Revascularized patients were mostly treated by TEVAR electively. A significantly higher overall stroke rate (15.4% versus 1.1% P<0.0001), spinal cord ischemia rate (11.5% versus 2.1%, P=0.026) and 30-day mortality rate (11.5% versus 1.1%, P=0.003) was found in the unrevascularized cohort. Posterior stroke rate (6.7% versus 1.1%, P=0.068) and left arm claudication (11.6% versus 3.2%, P=0.090) was more commonly observed in unrevascularized patients.
CONCLUSIONS: This study demonstrates that a strategy of selective revascularisation of the LSA, based on anatomical dominance of the vertebral artery and medical history, in case of coverage of the LSA by a thoracic stentgraft is associated with less neurological complications.

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Late open repair of aneurysmal evolution of complicated acute TYPE-B dissection treated with TEVAR

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OBJECTIVE: Thoracic endovascular aortic repair (TEVAR) is considered the gold standard treatment for acute type-B dissections (ABD); however late aortic aneurysmal evolution is still a concerning complication, that may need open surgical repair (OSR) in selected cases.
METHODS: This is a single-center case series from 2016 to 2018, including all cases of late OSR for aortic aneurysmal evolution after TEVAR for complicated ABD. Indication to primary treatment was a complicated ABD. Indication to secondary OSR was increasing of abdominal aortic diameter >60 mm.
RESULTS: Primary intervention consisted in standard TEVAR in one case and in the Petticoat technique in 2 cases. Proximal landing zone was 2 in 2 cases, 1 in one case. Secondary OSR was performed after 26±12,6 months. Mean aneurysm diameter at the aortic visceral level was 72±7,5mm. All 3 cases underwent thoraco-phreno-laparotomy; proximal cross-clamping was performed at the level of the stented proximal descending aorta and a sequential clamping-and-repair technique was used under right femoro-femoral extracorporeal support. Removal of the uncovered stent was necessary in the 2 cases of Petticoat technique; a "triple layer" proximal anastomosis was performed including aortic wall, endograft and Dacron surgical graft. Visceral artery reconstruction consisted first in a left renal bypass to maintain renal antegrade perfusion, then a Carrel's patch for right renal, celiac and superior mesenterial artery. There were no perioperative deaths; wound dehiscence occurred in 3 cases, paraplegia in 1 case, deep venous thrombosis in 1 and empyema in 1. No aneurysm-related reinterventions and deaths were reported after a mean 12,3±8,2 months of follow-up.
CONCLUSIONS: TEVAR allows a successful treatment for the acute phase of complicated ABD, but late aortic aneurysmal evolution represents a challenging complication, that may require OSR in selected cases. Secondary OSR is complex and high-risk, but seems a good long-term option when carefully planned and performed.

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Manipulating stent-graft configuration to diminish gutter area following chimney technique: an *in vitro* biomechanical study

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BACKGROUND: Endoleak is a major complication of chimney technique in treating aortic pathologies. This study was designed to obtain

an optimized stent-graft configuration minimizing the gutter spaces between the stent-grafts as well as between the stent-graft and the aortic wall.
METHODS: Five models of stent-graft suitable for chimney technique were constructed. There are one control group (amplitude 10 mm, 8 crowns) and altogether four groups of modified stent-grafts (There are two different crown numbers: four crowns on seclusion side + eight crowns on covering side, four crowns on seclusion side + twelve crowns on covering side, each of those two are subdivided into 2 different wave amplitudes: 10 mm and 15 mm.). The chimney stent was Viabhan (diameter 8 mm, length 240 mm, 10 crowns in a single ring). Gutter areas and stress analysis on aortic wall in different stent-graft configurations were measured using finite element analysis. After single ring of each model were fabricated, *in vitro* release, computed tomography scan and were conducted to further verify the result of the finite element analysis.
RESULTS: The finite element calculations of the gutter areas were: 45.58 mm^2 (S), 16.46 mm^2 (S1), 38.24 mm^2 (S2), 23.96 mm^2 (S3), 42.08 mm^2 (S4), respectively. The CT scanning were: 47.49 ± 1.44 mm^2 (S), 19.55 ± 0.98 mm^2 (S1), 40.05 ± 1.05 mm^2 (S2), 27.77 ± 0.90 mm^2 (S3), 50.99 ± 1.47 mm^2 (S4). The stress analysis of stent-graft revealed that S1 and S2 were well attached without increasing stress on the aortic wall.
CONCLUSIONS: S1 (amplitude 10 mm, 4 crowns on seclusion side + 8 crowns on covering side) may have lowest gutter area. Manipulating the configuration of the stent-graft still requires further material and structural optimization in greater details. In vitro simulations and animal experiments are needed to verify its safety and viability.

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Wall shear stress assessment of the false lumen in abad visualized by 4D flow MRI

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BACKGROUND: 4D flow MRI can be used to obtain more insight in the hemodynamic changes during cardiac cycle in the true and false lumen of uncomplicated Acute type B Aortic Dissection (uABAD). Gaining more insight of these forces in the false lumen in uABAD during optimal medical treatment, might result in prediction of adverse outcomes. The objective of this study was to examine the influence of heart rate (HR) on the volume, mean and peak WSS by 4D flow MRI in the false lumen in a validated aorta dissection model.
METHODS: A porcine aorta dissection model with an artificial dissection was positioned in an ex-vivo circulatory system with physiological pulsatile flow. 4D flow MR images with three set heartrates (HR; 60, 80 and 100 bpm) were acquired. False lumen volume per cycle (FLV), mean and peak systolic WSS were determined from 4D flow MRI data. For validation, the experiment was repeated with a second porcine aorta dissection model.
RESULTS: During both experiments an increase in FLV (ΔFLV = 2.05 ml, P<0.001, repeated experiment: ΔFLV = 1.08 ml, P=0.005) and peak WSS (ΔWSS = 1.2 Pa, P=0.004, repeated experiment: ΔWSS = 1.79 Pa, P=0.016) was observed when HR increased from 60 to 80 bpm. Raising the HR from 80 to 100 bpm, no significant increase in FLV (P=0.073, P=0.139) was seen during both experiments. The false lumen mean peak WSS increased significant during initial (2.71 to 3.85 Pa; P=0.013) and non-significant during repeated experiment (3.22 to 4.00 Pa; P=0.320).
CONCLUSIONS: The experiments showed that an increase in HR from 60 to 80 bpm resulted in a significant increase of FLV and WSS of the false lumen. This support that strict heart rate control is of major importance to reduce the mean and peak WSS in uABAD.

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Increased oxidative stress in patients suffering of aortic dissection

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BACKGROUND: Aortic dissection is caused by a tear in the intimal layer of the aorta or bleeding within the aortic wall, resulting in the separation of the layer of the aortic wall. For type A dissection, prompt surgical repair is recommended while for acute type B dissection, medical management is advised in the attempt to transform the acute event into a chronic scenario. Here, we investigated the oxidative stress profile in patients presenting aortic dissection.
METHODS: Eighteen patients (mean age: 62 ± 13 years, 10 men, 8 women) diagnosed for aortic type A (N.=9) or type B (N.=9) dissections were invited to participate in a large study on dissected aorta. Oxidative stress status was evaluated by measurement in blood antioxidants (vitamin C and E, beta – carotene, thiol proteins, glutathione peroxidase, paraoxonase), trace elements (selenium, copper, zinc, copper/zinc ratio) and markers of oxidative damage to lipids (lipid peroxides and oxidized LDL).
RESULTS: When compared to normal reference values, Important deficits in vitamin C, beta – carotene, gamma-tocopherol, thiol proteins, zinc and selenium were respectively observed in 67 %, 17%, 89%, 72%, 39% and 67 % of patients. By contrast, plasma concentrations higher than the upper reference value were detected in 78% of patients for copper, 89% for copper/zinc ratio, 68% for glutathione peroxidase and 94% for lipid peroxides. Except for vitamin C, copper and copper/zinc ratio, oxidative stress status was similar in both type A and type B patients.
CONCLUSIONS:The present study revealed that a heightened oxidative stress characterized patients suffering of aortic dissection. If age, dyslipidemia, hypertension or smoking are common risk factors of the disease, particular attention should, therefore, be also paid to optimize altered antioxidant status in order to prevent this pathology.

Thursday May 23, 2019
08:00 – 09:30

Vascular Abstracts Session 3: Vascular Biology

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Time-dependent changes in atherosclerotic lesions after a neurological index event

Jessica Pauli, Pavlos Tsantilas, Michael Kallmayer, Lars Maegdefessel, Hans-Henning Eckstein, Jaroslav Pelisek

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BACKGROUND: Stroke is the second most common cause of death worldwide. Thus, treatment of cerebrovascular events is increasingly

important as current strategies cannot completely prevent ischemic incidents. Current guidelines recommend surgical intervention in patients with >50% carotid artery stenosis within 14 days after the neurological index event (IE). Though, there is still uncertainty about the ideal time point within those 14 days. Therefore, the aim of the current work was to determine disease-relevant and time-dependent pathological factors following IE. Particular attention has been paid to macrophage subtypes and fate decision in smooth muscle cells (SMCs).
METHODS: Sixty human carotid atherosclerotic tissue samples of the "Munich Vascular Biobank" were included. The plaques were divided according to the surgical time point in early CEA (1-2 days after IE, N.=34) or late CEA (30-60 days after IE, N.=26). Moreover, the plaques were morphologically separated into stable and unstable lesions. Four healthy carotid arteries served as controls. Plaques were analyzed by immunohistochemistry using antibodies for inflammatory cells (CD68, CD45, CD3, MARCO, CD163) and SMCs (SMA, SMMHCl&ll), mRNA Expression was analyzed with RT-qPCR for CD68, MYH11 (contractile SMCs) and MYH10 (synthetic SMCs).
RESULTS: The immunohistochemical analysis showed no differences between any of the study subgroups. In the expression analysis, statistically significant differences were associated with SMC phenotypes. At late CEA, stable plaques showed a significant increase in synthetic SMCs (P<0.001) and a significant decrease in contractile SMCs (P=0.009). Unstable plaques were linked to reduced synthetic SMCs at late CEA and a decrease in inflammation (CD68 positive cells).
CONCLUSIONS: The current results indicate that less vulnerable plaques further stabilize over time after a neurological index event, whereas unstable plaques continuously destabilize. Assuming that unstable plaques are very likely responsible for an ischemic stroke, patients with these plaque features should be surgically treated earlier after an IE.

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Thrombin-antithrombin complex in patients with abdominal aortic aneurysm and peripheral arterial disease undergoing endovascular interventions

Michal Juszynski, Grzegorz Madycki

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BACKGROUND: The level of activation of fibrynolitic system among patients with vascular disorders influences the course of their diseases as well as the results of operations and postoperative follow-up. While the activation ot thrombin cannot be measured directly, because it connects with antithrombin forming the complex, Therefore, the assesment of thrombin – antithrombin (TAT) complex levels in the blood serum of that patients seems to be the reasonable method to estimate their susceptibility to postoperative complications.
METHODS: 60 patients were included in the study: 20 with AAA and 40 with PAD. Among patients with PAD: 20 were treated with PTA for the first time and 20 were treated with PTA due to the restenosis after PTA pefrformed beforehand. 20 healthy volunteers were the control group. All the patients (and volunteers) had the sample of the blood collected in admission to the hospital and the level of the TAT coplex were measured.
RESULTS: The mean levels of the TAT complexes in the blood serum among patients with AAA were 10,6g/l. Therefore they were elevated more than twice above the norm (4,1g/l). Patients with PAD admitted for the first-time PTA had the mean level of TAT complexes sligtly elevated (mean 4,8g/l), but patients with PAD admitted to treat the postoperative complications (restenosis after PTA) had the levels of TAT complexes even higher than patients with AAA (mean 11,8g/l). The levels of the TAT complexes among healthy volunteers didn't exceed the norm (max. 4g/l).
CONCLUSIONS: The measurment of the levels of the TAT complexes in the blood serum among the patients with vascular disorders seem to be the good method of assessment of the severity of their disease as well as their susceptibility to complications.

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Specific HDL function modifications in patients with abdominal aortic aneurysm

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BACKGROUND: Abdominal aortic aneurysm (AAA) is a common pathology with multifactorial ethiopathogenesis. The relationship between AAA pathogenesis and serum lipid levels or function is not well understood. We analysed serum lipoproteins functions, as cell cholesterol efflux capacity (CEC) and cholesterol loading capacity (CLC), in patients with AAA to evaluate not their atherogenic potential but a possible relationship with AAA development.
METHODS: AAA (N.=30) and control patients (N.=21), age- and sex- matched with no aneurysm but with the same pro-atherogenic comorbidities, were enrolled. HDL CEC was assessed by radioisotopic technique specific for aqueous diffusion (AD) and ABCG1 or ABCA1 transporters. Serum CLC was measured by a fluorimetric assay.
RESULTS: We did not find any significant difference comparing serum lipid profile in patients with AAA and control patients. ABCG1-CEC was significantly reduced while ABCA1-CEC was higher in AAA patients, suggesting a block in HDL maturation. This is supported also by the finding that ABCG1-CEC inversely correlates to ABCA1-CEC and directly correlates to AD-CEC only in AAA patients. Again only within the AAA group, smokers had significantly lower ABCG1-CEC and higher ABCA1-CEC compared to non-smokers, indicating a role for smoke in altered HDL maturation in AAA patients. CLC did not differ between AAA patients and controls, but only in the AAA group CLC values correlated directly to HDL levels, ABCG1-CEC and AD-CEC, suggesting a role for HDL in serum-induced cell cholesterol accumulation only in AAA patients.
CONCLUSIONS: Our data indicate that lipoprotein function modifications specific for AAA patients occur, likely due to a block in HDL maturation and possibly favoured by smoking. Such lipoprotein function abnormalities are not necessarily involved in the atherosclerotic process, but could contribute to local aortic wall pathologic processes involved in AAA development.

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Inguinal microbiome in patients undergoing an EVAR: Application of next-generation sequencing and immunofluorescence

Bastiaan Vierhout[1], Alewijn Ott[2], Inge Kruithof[3], Elisa Raineri[4], Genevieve Bravo Ruiseco[4], Guido Wisselink[2], Evert van Zanten[2], Guido Raangs[4], Mirjam Kooistra-Smid[2], Clark Zeebregts[4], Robert Pol[4]

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BACKGROUND: Surgical site infections (SSI) remain a hazardous complication after vascular surgery. For one, it is time-consuming to

identify the microbes causing these infections using standard techniques. In this pilot study we investigated the relation between SSI and preoperative nose and groin cultures and inguinal skin biopsies using histology, immunofluorescence and Next Generation Sequencing.
METHODS: Data on surgical site infections and skin samples from the Percutaneous in Endovascular Repair versus Open (PiERO) trail were evaluated. Two patients with SSI were matched to eight patients for age and comorbidity. All patients were treated for an abdominal aortic aneurysm with endovascular repair. Nasal and perineal cultures were taken preoperatively to detect Staphylococcus aureus carriage. After disinfection with chlorhexidine, groin biopsies were taken to identify bacteria in deeper skin layers. All groin biopsies were analyzed microscopically with immunofluoroscopy using fluorescent in situ hybridization. All samples were subjected to culture-free 16S-23S rDNA next-generation sequencing.
RESULTS: Staphylococcal aureus species were cultured in 5 out of 20 preoperative nasal and perineal swaps. Next-generation sequencing of the 16S-23S rRNA region identified DNA of bacterial species in all biopsies (20/20). Most identified genera and species were known skin flora bacteria. Fluorescent in situ hybridization confirmed presence and localization of these bacteria after disinfection. No relation was found between identified species causing surgical site infections and the preoperative microbiome.
CONCLUSIONS: In this small number of patients, a detailed and innovative analysis of the preoperative microbiome did not show a relation with the occurrence of a surgical site infection. No pathogenic bacterial species were present in the inguinal skin after disinfection with chlorhexidine. Further research in a large cohort of patients seems warranted.

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Mitochondrial transplantation ameliorates acute limb ischemia

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BACKGROUND: Mitochondrial injury has been shown to play a key role in skeletal muscle ischemia-reperfusion injury, leading to decreased muscle viability and limb function. Acute limb ischemia (ALI) is the most challenging form of ischemia-reperfusion injury. In previous studies, we have shown that mitochondrial transplantation (MT) is an efficacious therapeutic strategy to replace or augment mitochondria damaged by ischemia-reperfusion injury allowing for enhanced muscle viability and function in cardiac tissue. In this study, we investigate the efficacy of MT in a murine ALI model.
METHODS: C57BL/6J mice, (male, 10-12 weeks) were used for ALI. Sham mice received no ischemia. Ischemia was induced by applying a tourniquet on the left hindlimb. Following 2 hours ischemia, the tourniquet was released and either vehicle alone (N.=15) or vehicle containing mitochondria (N.=33) was injected directly into all the muscles of the hindlimb. Mitochondria were delivered by direct injection at $1x10^6$, $1x10^7$, $1x10^8$, or $1x10^9$ per gram wet weight. Following 24 hours reperfusion, limb function was assessed by DigiGait analysis and then animals were euthanized, and tissue collected for muscle damage analysis. Specific analysis in the gastrocnemius, soleus and vastus medialis was performed.
RESULTS: Infarct size and apoptosis were significantly decreased ($P<0.001$, $P<0.05$, respectively) in all muscles studied (gastrocnemius, soleus and vastus medialis) in MT mice as compared to Vehicle mice for all mitochondrial concentrations. DigiGait analysis at 24 hours reperfusion showed % shared stance time was significantly increased ($P=0.02$) and stance factor was significantly decreased ($P<0.001$) in Vehicle as compared to MT mice and Sham. No significant differences in % shared stance time ($P=0.112$) or stance factor ($P=0.252$) were observed between MT and Sham mice.
CONCLUSIONS: Mitochondrial transplantation is an efficacious therapeutic protocol to ameliorate skeletal muscle injury and enhance hind limb function following ALI.

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Adipose-derived stem cell application in the patients with critical limb ischemia

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BACKROUND: Critical limb ischemia (CLI) is a serious condition with limited treatment options and may result amputation of affected limb. Autologous adipose-derived stem cells (ADSCs) can be prepared in a same-day procedure. ADSCs are highly angiogenic. ADSCs are a novel therapy for patients with CLI. Here, we describe successful, effective and safely clinical implementation of autologous ADSCs for the treatment of no-option CLI patients.
METHODS: Between 2012 and 2018, 67 male and 33 female patients with CLI were treated with ADSCs. Causes of CLI were Buerger's disease, diabetic angiopathy and atherosclerotic disease. The patients have for treatment of no-option.The primary objectives of treatment were the preservation and rescue of the affected limb and increase in total walking distance. The secondary endpoint was improvement in rest pain, increase in pain-free walking distance (PFWD) and ankle brachial pressure index (ABPI). The ADSCs were isolated from abdominal adipose tissue of 120 mL per each limb. Enzymatic digestion was carried out using collagenase, centrifugation for separation of stromal vascular fraction, and filtration and washing of the sample. The ADSCs were suspended in 15 cc of PRP and injected intramuscularly along the impaired vessels at intervals 1 cm apart. If the patient has a wound the ADSCs were implanted directly throughout the ulcers.
RESULTS: The mean follow-up period was 46 months. No adverse events related to stem cell treatment occurred during the follow-up. ADSCs demonstrated significant functional improvement results including increased PFWD, and rest pain reduction. No amputations were reported during the follow-up.
CONCLUSIONS: Intramuscular injection of ADSCs is very safe and is shown to prompt functional improvement in patients with CLI.

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Study of engineered vascular bioprostheses in bioreactor

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BACKGROUND: The possibility to have biodegradable small-diameter vascular prostheses represents an ambitious goal in vascular tis-

sue engineering. Different approaches have been proposed to fabricate vascular constructs aiming to have good physico-chemical, mechanical and biological properties. Studies in bioreactors are necessary to obtain information about the behaviour of the prostheses under dynamic conditions predicting many parameters (degradation, release of bioactive compounds etc.) that the vascular grafts will show *in vivo*.
METHODS: To synthesize vascular bioprostheses, electrospinning technique has been used: poly (caprolactone) and poly (glycerol sebacate), both 20 % (w/v), at a ratio of 1:1 (v/v) and in the presence of quercetin (0.05 %, w/v) were electrospun on a collector of 2 mm in diameter. The electrospun constructs were coated with a layer of gelatin at 37°C for one hour reducing their permeability. Scaffolds were tested in dynamic conditions using an *ad hoc* bioreactor consisting of a peristaltic pump, a manometer, a flow chamber for the scaffold, and a reservoir. Phosphate buffered saline (PBS) solution flowed in the bioreactor under physiological conditions for 1, 2 and 3 months. Daily, a part of PBS was collected to analyse the release of gelatin and quercetin. At the end of the experiment, morphological and mechanical properties of the grafts were studied.
RESULTS: Scanning electron microscopy showed that the randomized fibrous structure was altered in function of the permanence time in the bioreactor. The release of gelatin and quercetin was significantly different in comparison with those studies performed in static conditions (data previously presented). Mechanical properties were studied in terms of Young's modulus, tensile strength and elongation percentage highlighting that the proposed engineered bioprostheses represent a promising tool for vascular tissue engineering.
CONCLUSIONS: The obtained results proved the importance of studying engineered grafts in dynamic conditions with the aim of simulating an *in vivo* implant.

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Benefits of porcine xenodressings in a surgical reparative approach of chronic skin ulcers

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BACKGROUND: Chronic skin ulcers complicating arterial or venous diseases and systemic pathologies with microcirculatory involvement have an impact on quality of patients' life in terms of frequent hospitalizations and pain management that is a challenging issue. The key point is to make stalled skin lesions healable and vital by reactivating blocked repair process.
METHODS: In last six months under regional anesthesia we performed artificial skin grafting on thirteen chronic and unhealable ulcers, some very extensive, after having achieved microbiological infection absence and an adequate surgical debridement. We used an aldehyde cross-linked with porcine dermis that was applied invaginating artificial skin in wound edges through ethilon 4-0 sutures according to whipstitch technique; in order to keep tightly attached the meshed graft to wound bed, a NPWT up to -90 mmHg or elastocompressive bandages were placed by using, nevertheless, an antiseptic soft paraffin gauze or silver nanocrystals dressing as interface. After few days all patients were discharged.
RESULTS: In all cases we observed early pain reduction, especially due to coverage of nervous endings, improving patients' compliance both baseline and at dressing changes; moreover exudate loss was clearly diminished because exposed wound surfaces were thus covered and local phlogosis was reduced. Biological dressings ensured a good antibacterial mechanical protection and prevented further tissutal necrosis progression also in patients affected from PAOD Fontaine stage IV recently revascularizated. In the weeks after artificial graft implant, proliferation and differentiation of epithelial and endothelial cells led to wound bed colour improvement and granulation tissue appearance getting a significant reduction of wound size until a complete skin re-epithelization in cases of smaller defects. No complications were found.
CONCLUSIONS: Xenodressings as porcin skin can modify natural trend of a chronic unhealable ulcer, resulting an optimal temporary 'coverage' and a bridge to a spontaneous healing or to autologous skin grafting.

Thursday May 23, 2019
14:00 – 16:00

Cardiac Abstracts Session 2:
Rhythm Surgery & Miscellaneous76

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Objective model for competency-based residency training in cardiac surgery

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[2]*Klinikum Kassel, Kassel, Germany*

BACKGROUND: Cardiac surgery training has become more challenging as available cases are becoming more complex. Accordingly, we aimed to develop a multi-categorical assessment model for evaluating cardiac surgical residents. This model is intended to ensure a goal-directed progress in their training and to recognize and support their surgical talents.
METHODS: 64 competencies out of the four dimensions (personality, communication, behaviour and intellectual skills) were prioritized. Out of them, the 20 most relevant competencies for cardiac surgical training were adjusted to the requirements of our institution and approved by consent. For each competency, a target range was defined. In order to evaluate this range, four behavioural marker questions were drafted. In addition to the non-technical characteristics mentioned above, four technical categories (clinical, interventional, surgical skills and professional expertise) were identified by the same procedure and included in our evaluation system. Both categories (non-technical and technical) were adapted for each level of the training programme.
RESULTS: The resulting competence model achieved two main goals: 1st: Adjustment of the established competence model to the requirements of cardiac surgical training; 2nd: Suitability to different levels of the six-year training curriculum in cardiac surgery. Residents were anonymously assessed by all hierarchical levels in order to achieve a high level of objectivity.
CONCLUSIONS: This evaluation model is highly objective, as residents are evaluated from multiple hierarchical levels. It allows an individual support and enables a better transparency in residency training. Talent and skill are constantly evaluated, recognized and adopted as a base for individual feedbacks and personalized training programs.

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Medium-term results after cardiac surgery in the frail population. Can frailty improve mortality prediction?

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BACKGROUND: The age of the population is increasing along with the frailty of the patients. Risk prediction scores, such as EuroSCORE I (ESI) and II (ESII), underestimate mortality in frail patients. We investigate whether adding frailty scores can improve the predictive capacity of these scales.
METHODS: Prospective cohort study of patients ≥70 years undergoing elective cardiac surgery. Before surgery, a comprehensive geriatric evaluation and a frailty assessment were conducted. Frailty was evaluated using the FRAIL questionnaire and the Fried criteria. From October 2017 to December 2018, 134 patients have been included, operated and evaluated after discharge. Their outcomes are analysed using univariable and multivariable methods; scales discrimination power was further analysed using ROC curves.
RESULTS: Mean age 76.2±3.8 years; 29.9% were octogenarians; 61.2% male; mean ESI 8.9±5.9%; mean ESII 4,7±4,9%; 39.5% were ≥ NYHA class III. 48.5% of patients were considered frail when using FRAIL and 35.1% according to Fried criteria. Operative mortality was 5.2 %. Severe pulmonary hypertension (P=.023), ESI (P=.013), ESII (P=.018), KATZ independency index (P=.032), slow gait speed (P=.038), decreased hand-grip strength (P=.036), FRAIL questionnaire (P=.005), and Fried criteria (P=.008) showed a significant association with mortality. The area under the curve (AUC) of ESII was not statistically significant for predicting mortality (P=.10). ESI had an AUC of .81 (P=.005). Predictive capacity could be improved upon by the addition of both, the FRAIL (P=.003) and Fried (P=.002) scales. Mean follow-up was 8.6±4 months. Mortality occurred in 1.6% and did not show any significant association with frailty.
CONCLUSIONS: Frailty increases operative mortality in cardiac surgery. Risk prediction could be improved by adding frailty scales to standard scales. Frailty was not significantly associated with late mortality or during follow-up.

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The clover technique for the treatment of complex severe tricuspid valve insufficiency

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BACKGROUND: Regurgitation is a common echocardiographic finding resulting from tricuspid valve abnormalities. "Clover technique", as a method of choice, should be assessed in terms of immediate and later results after the treatment of severe tricuspid regurgitation (TR).
METHODS: From 1754 patients operated last 15 years for tricuspid valve pathology, 52 of them with severe prolapse (29) or tethering (23) underwent "clover repair". Operatory technique consistedin stitching together the central part of the free edges of the tricuspid leaflets. Repair was associated with annuloplastyin all cases. Mid-term and long-term follow-ups were available.
RESULTS: The in-hospital mortality was 5,8% (3 deaths). After the surgery the grade of regurgitation decreased from 3-4 (+) to 0-1 (+) in 35 cases and to 2 (+) - in 14 of them. Main tricuspid valve area and mean pressure gradient were 4,4 ± 0,8 cm^2 and 3,2 ± 0,6 mmHg. During the follow-up period (mean length 7,2 ± 1,3 years, range 18 months – 10,5 years) the relapse of severe TR was mentioned in 3 cases (6,1%), 2 of them needed reoperation.
CONCLUSIONS: Complex forms of TR due to severe prolapse or tethering of the leaflets can be effectively treated with clover technique with good mid-term and long-term results.

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Hedinger syndrome – First experience and 2-year follow-up in patients with carcinoid heart disease

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BACKGROUND: Carcinoid heart disease (CHD, Hedinger syndrome), a rare and unique manifestation, has been described in up to 60% of patients with both neuroendocrine tumors (NETs) and carcinoid syndrome (CS), typically inducing right heart-sided abnormalities. We describe the initial experience and two-year-results in patients presenting with CHD.
METHODS: Between 07/15 and 10/18, 6 patients (mean age 62±1 years; 3 females) with symptomatic different valvular lesions (NYHA III-IV) caused by Hedinger Syndrome, were operated at our center. Clinical data, adverse events and patient outcomes were recorded. To avoid carcinoid crisis, all subjects were started on an Octreotide infusion of 100 mcg/h 12h prior to surgery and for 48h post-surgery.
RESULTS: The tricuspid valve was involved in all patients. Tricuspid valve repair was possible in 4 patients, whereas 2 needed replacement due to severe fibrosis. In two patients, operation was performed on the beating heart without cross-clamping. The pulmonary valve was concomitantly replaced in 2 patients. In 2 patients, the aortic valve was replaced. ECC time was 131±66min. and aortic cross-clamping was 61±50min. One patient with severely impaired right ventricular function needed ECMO support on the first postoperative day, and died 3 days later due to neuroendocrinal enzyme storm. At 13 months, one patient showed severe tricuspid stenosis and underwent re-operation with replacement of the valve. One patient died 18 months postoperatively related to the underlying tumor disease. At 30 months follow-up, 4 patients were alive and asymptotic (NYHA I).
CONCLUSIONS: Hedinger Syndrome is a challenging entity in cardiac surgery characterised by aggressive valve lesions combined with metastatic neuroendocrinal neoplasia with systemic secretion of vasoactive substances affecting the endocard and the systemic circulation. We advise a multidisciplinary collaboration to early diagnose potential cardiac involvement to offer potential early treatment and a specific anesthetic regime.

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Results of minimally invasive hybrid procedure for lone atrial fibrillation

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BACKGROUND: Atrial fibrillation(AF) is a global pandemic affecting over 50 million people worldwide with additional 5million new cases

yearly. It is a significant source of morbidity and healthcare expenditure. The search for the optimal treatment of AF is still on going. Existing therapies have short comings of efficacy, adverse side effects and invasiveness. The hybrid AF ablation programme is a novel technique aimed at addressing these shortcomings. We present results of 3year experience with the technique in our unit, in terms of its efficacy, adverse effects, and relative invasiveness and cost effectiveness.
METHODS: The hybrid AF ablation programme is a 2stage technique; 1st stage 3ports laparoscopy with sub-xyphoid port access pericardiotomy with radiofrequency epicardial lesion to left atrium and pulmonary veins using the N-contact device and catheters. The 2nd stage is percutaneous endocardial lesions after taco mapping to supplement the initial epicardial lesions. Prospective data on 30 consecutive patients with lone AF enrolled for the hybrid Ablation during the period. Demographic data, left atrial (LA) dimensions, duration of AF, medication. Length of hospital stay (LOS) and rhythm assessment with 12 lead ECG/reveal device at and 6, 12, 18 and 30months follow-up. Any complications were noted.
RESULTS: N.=51patients, Age: mediaN.=64yrs(50-80yrs), 60% male, 28% had paroxysmal and 72% persistent AF. Duration of AF: mediaN.=3(1- 16yrs), LA size(mm): MediaN.=48(20-65), the 2nd stage was completed in 46/51(90%) cases. Follow-up: with 12 lead ECG/reveal, Conversion rate at 6month 9/11(91%), at 1yr 19/24(79%), at 18months 24/32(76%), at 30months 35/46(76%). LOS, Median 1(1-4) days. Most patients had LOS of 1day-32/46(70%), 2days- 13/46(28%), and only one stayed 4days- 1/46 (2%) due to AKI. complications: wound infectioN.=2, Sternotomy = 1, severe chest pain(Dressler = 3),Stroke = 1, no mortality.
CONCLUSIONS: conversion rate of 76% at 30months with predominantly one day LOS. It has minimal complications with no mortality, the initial results are promising.

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Does the surgical technique for LAA-CLOSURE affect clinical outcome in patients with preoperative atrial fibrillation?

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BACKGROUND: Left atrial appendix (LAA), as an essential source of systemic embolism and stroke in patients with atrial fibrillation can be excluded during cardiac surgery, however the role of LAA-closure techniques and it's influence on clinical outcome is as yet uncertain.
METHODS: A total of 192 from 3741 consecutive patients with preoperative atrial fibrillation and presenting a high risk for stroke (CHA2DS2-VASc-Score≥2) who underwent surgical LAA-closure between 01/2012 and 12/2015 were analysed for mortality and stroke rate at 30 days, 12 and 24 months. Patients with endocardial LAA-closure (group 1, N.=118) were compared to patients with epicardial LAA-closure (group 2, N.=67). To further adjust for pre- and intraoperative risk factors, a propensity score stratification analysis based on patients age, gender, EuroSCORE-2, CHA2DS2-VASc-Score and type of procedure was performed.
RESULTS: Patients age was 70.7±8 years (mean±SD) and 60% were male. EuroSCORE-2 was 8.3±7.4% and 5.3±4% and CHA2DS2-VASc-Score was 4.1±1.5 and 4±1.4 on average for the respective groups. The incidence of stroke was 1,7% at 30 day and 4,4% at 12 and 6.25 % at 24 months in group 1 and there was no stroke at 12 months and 1.5% at 24 months in group 2. In group 1, 36.4% of the patients underwent surgical ablation and 58.2% in group 2. After propensity score stratification, the overall mortality and stroke rate did not differ between the groups at 12 and 24 months follow-up.
CONCLUSIONS: Although there were fewer strokes in patients undergoing epicardial LAA-closure at 1-year follow-up (P=0.08), the propensity score stratification analysis showed no clinical benefit in freedom from stroke or survival until 12 and 24 months in both groups.

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Do patients with atrial fibrillation benefit from concomitant left atrial appendix closure during cardiac surgery?

Tomas Kozmik[1], Julia Pisarenko[2], Daniel Wendt[1], Nico Meinhard[1], Wilko Weissenberger[1], Fanar Mourad[1], Sharaf Shehada[1], Ilir Balaj[1], Omar A. Issa[1], Konstantinos Tsagakis[1], Mohammed El-Gabry[1], Heinz Jakob[1], Markus Neuhäuser[2], Matthias Thielmann[1]

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BACKGROUND: LAA, can be excluded during cardiac surgery (CS), however the clinical benefit is as yet uncertain.
METHODS: A total of 376 out of 3741 consecutive patients with AF presenting a high risk for stroke who underwent CS between 01/2012 and 12/2015 were analysed for mortality and stroke rate at 30 days, 12 and 24 months. Patients with concomitant LAA-closure (group1;N.=107) were compared to patients with concomitant surgical ablation (SA) and LAA-closure alone (group2;N.=85), and patients without SA and no LAA-closure (group3;N.=184) as controls. A propensity score stratification analysis based on patients basic characteristics was performed.
RESULTS: Patients age was 72±8 years (mean±SD) and 33% were female. EuroSCORE-2 was 8.7±7.7%, 5.7±3.9%, and 5.4±8.4% and CHA2DS2-VASc-Score was 4.2±1.5, 3.9±1.4, and 4.1±1.4 on average for the respective groups. Mortality did not differ between groups at 30 days, 12 and 24 months. The incidence of stroke was 1.9% at 30 days, 4.8% at 12 and 6.7 % at 24 months in group1. There was no stroke at 30 days and 12 months but 1.3% at 24 months in group2, and 1.8% at 30days, 3.0% at 12 and 24 months in control group3. The overall mortality at 24 months was 27.1%, 20% and 24.6% respectively. After propensity score adjustment, stroke rate showed significant benefit in group2 (P=0.005) at 12 months and a hazard ratio of 0.17, 95% confidents limits 0.02-1.50, (P=0.08) at 24 months, whereas overall mortality did not significantly differ between the groups at 12 and 24 months follow-up.
CONCLUSIONS: In this propensity score risk-adjusted analysis, patients undergoing CS with SA and concomitant LAA-closure had significant fewer strokes at 12 months follow-up compared to patients undergoing CS with LAA-closure alone. Therefore, a concomitant LAA-closure during CS without additional surgical ablation does not show any clinical benefit in terms of reduced stroke rate until 12 and 24 months follow-up.

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Pulmonary vein ablation for prevention of atrial fibrillation after CABG (PULVAB): Early outcomes in RCT

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BACKGROUND: To evaluate in-hospital results in prospective RCT PULVAB (Prophylactic Pulmonary Veins Ablation).

METHODS: The RCT PULVAB included 96 CAD patients, that were randomized in 3 groups.In 1st group (N.=34), only conventional CABG was performed. In 2nd group (N.=29),CABG was combined with prophylactic pulmonary vein(PV) bipolar ablation. In 3rd group, CABG was combined with PV ablation and amiodarone was administered just after the procedure.
RESULTS: Prophylactic pulmonary bipolar RF ablation did not lead to the increase of the operation main stages length. The mean time of operation is 251 ± 37.7 min in group 1; 250.4 ± 42.5 min in 2nd group and 244.2 ± 29 min in 3rd group (P=0.114). CPB time and didn't differ too: 88.6 ± 19.2 min; 92 ± 18.4 and 84.8 ± 17.3 min (P=0.08) respectively.
None of the patients from all groups died. Significant complications (bleeding, wound complications, stroke and perioperative myocardial infarction) didn't occur.
Postoperative atrial fibrillation (POAF) identified in 11 (32.4%) cases in the group 1;in 6 (20.7%) cases in the 2nd group and in 2 (6.1%) cases in the 3rd group. There was no significant difference between 1st and 2nd groups (P=0.298) and between 2nd and 3rd groups (0.086) also. Statistically significant difference was registered between 1st and 3rd groups (P=0.0065),which indicates the effectiveness of POAF prevention with PV ablation and amiodarone administration.Atrial fibrillation in 91% of patients had been occurred at 2-3 days of the postoperative period.Sinus rhythm at discharge from hospital recorded in 97.1% cases in 1st group;in 96.7% cases in 2nd group and in 97% cases in 3rd group (P=0.293).
CONCLUSIONS: POAF incidence was significantly lower after preventive bipolar radiofrequency ablation of the pulmonary veins. Combination of bipolar RFA and amiodarone revealed significant positive results in the prevention of POAF.

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Infection risk index in cardiac surgery score, an improvement in estimating surgical site infection risk

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BACKGROUND: Various scoring systems have been designed with the aim of predicting the risk of surgical site infection (SSI), their discriminatory abilities are limited. Our objectives were to assess the predictive power of the National Nosocomial Infections Surveillance, Australian Clinical Risk Index, and EuroSCORE and to design a new scoring system (using only preoperative variables) and compare its usefulness against the conventional systems.
METHODS: A prospective sample (n: 2,020) was divided into two periods. The first (2010–2014; n: 1,298) was used to design the scale, which was then validated against the other (2015–2017; n: 722).
RESULTS: In the logistic regression analysis diabetes mellitus (odds ratio [OR] = 3.3; 95% confidence level [CI]: 2–5.7), obesity (OR, 4.5; 95% CI: 2.2–9.3), and surgical duration (OR = 1; 95% CI: 1–1.01) were associated with SSI risk. The new score was constructed using only preoperative variables a summation system for punctuation by assigning one point to the presence of each variables. The incidence of SSI according to the IRIC categories were: IRIC-0, 2.5%; IRIC-1, 8.4%; and IRIC-2, 28.6 (c^2 test for trend = 40.44; P<0.05). The area under the receiver-operating curve (aROC) of the IRIC index was 0.70 (95% CI: 0.63–0.78). This was compared with the aROC values for the other indexes, presenting a better power of discrimination.
CONCLUSIONS: The SSI risk discriminatory abilities of the conventional scoring systems are limited. By contrast, our proposed scoring system is more precise and simple and includes only a few preoperative variables.

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Results of concomitant atrial fibrillation surgery: Outcome of the surgical maze procedure

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BACKGROUND: Atrial fibrillation(AF) is a global menace with significant morbidity and mortality. The global incidence is >50million.However this can be differentiated into standalone AF and concomitant AF. The AATS/STS and ESC/EACTS have both issued guidelines recommending concomitant AF surgery in all patients under cardiac surgery with no additional risk. This has both prognostic and symptomatic value. We present results of a 3-year experience of this practice.
METHODS: Retrospective data analysis of patients who underwent concomitant surgical MAZE procedure by a single surgeon in a single centre over a 3-year period(2014–2017). The conversion rates, impact on LV and LA size and any associated morbidity or mortality are presented. Follow-up with echocardiogram and 24 hour holter. Data presented as median interquartile range.
RESULTS: 40 patients had concomitant AF surgery during the period. 13(32.5%) female, age 73yr(45-82), duration of AF 3yr (1-10), preoperative LA size 48mm(35-61), preoperative LVEF 60%(25-70). Preoperative morbidity: TIA 2(5%), previous catheter ablation 1(2.5%). Concomitant Procedures: isolated CABG 7(17.5%), Isolated AVR 6(15%), Isolated MVR 11(27.5%), MVR+TVR 7(17.5%), AVR+aorta 2 (5%), AVR+TVR 3(7.5%), AVR+ MVR 1(2.5%), CABG + aorta 2(5%), AVR+CABG+ aorta 1(2.5%) Postoperative, conversion rate to sinus rhythm: at discharge 30 (75%), At 3month follow-up 33 (82.5%), at 6 months follow-up 34 (85%), at 1yr follow-up 36 (90%) and at 2yr follow-up 36 (90%). Postoperative LVEF: at 6months 55% (30-65), at 1 yr 60% (45-60), at 2 yr 60% (45- 60). Postoperative LA size: at 6months 45.5mm(35-57), at 1 yr 42mm (41-51), at 2yr 42mm(37-50). Pacemaker implantation rate 1 (2.5%) ICD implanted for VT. All-cause mortality during study period 1 (2.5%) due to brain tumour.
CONCLUSIONS: Concomitant surgical MAZE is safe and has high efficacy. It stabilises LA size and improves LV function. It should be offered to patients for symptomatic and prognostic benefits.

Thursday May 23, 2019
16:30 - 18:00

Vascular Abstracts Session 4: Peri-Operative Management

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A case series about the changed antiplatelet protocol for carotid endarterectomy: More patients with complications?

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BACKGROUND: In the Netherlands, clopidogrel monotherapy (CM) increasingly replaces acetylsalicylic acid and extended release dipyridamole (ASA-D) as the first-choice antiplatelet therapy after ischemic stroke. It is unknown whether the risk of peri- and postoperative hemorrhage in carotid artery surgery is higher in patients using CM compared to ASA-D. We therefore retrospectively compared occurrence of perioperative major and (clinical relevant) minor bleedings during and after carotid endarterectomy of two groups using different types of platelet aggregation inhibition after changing our daily practice protocol in our center.
METHODS: A consecutive series of the most recent 80 carotid endarterectomy patients (November 2015 - August 2017) treated with the new regime (CM) were compared to the last 80 (January 2012 - November 2015) consecutive patients treated according to the old protocol (ASA-D). The primary endpoint was any major bleeding during surgery or in the first 24 - 72 hours postoperatively. Secondary outcomes within 30 days after surgery, included minor (re)bleeding postoperative stroke with persistent or transient neurological deficit, persisting or transient neuropraxia, asymptomatic restenosis or occlusion, (transient) headache.
RESULTS: Postoperative hemorrhage requiring re-exploration for hemostasis occurred in none of the 80 patients in the group of the CM (new protocol) and it occurred in one of the 80 (1%) patients who was using ASA-D (old protocol). In three patients (4%) in the CM and one patient (1%) in the ASA-D protocol an ipsilateral stroke was diagnosed.
CONCLUSIONS: In this retrospective consecutive series the incidence of post-operative ischemic complications and perioperative hemorrhage after CEA are comparable in patients using CM versus ASA-D for secondary prevention after a cerebrovascular event and for the short- and midterm complications.

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Interfascial plane blocks reduce morphine consumption in patients undergoing thoracic outlet decompression

Jens Goeteyn, Niels Pesser, Renee van den Broek, Arthur Bouwman, Bart van Nuenen, Joep Teijink, Barbara Versyck

Catharina Ziekenhuis, Eindhoven, Netherlands

BACKGROUND: Postoperative analgesia in patients undergoing trans-axillary thoracic outlet decompression (TATOD) is challenging due to the invasive surgery, the complex innervation of the axillary region and the preoperative use of opioids by many patients. Commonly, pain is managed with additional opioids which introduces well-known side-effects. To investigate the analgesic efficacy of two novel regional anesthesia techniques, we performed a retrospective study comparing the combined pectoral block type 1 and erector spinae block (PECS1–ESB) and the pectoral blocks type 2 (PECS2) and to systemic intravenous opioids regimen (no block) in patients undergoing TATOD.
METHODS: We performed ten PECS1–ESB and ten PECS 2 blocks in patients undergoing TATOD. Twenty patients were randomly selected as controls. Primary endpoint was the 24-hours postoperative visual analogue scale (VAS) for pain. Secondary outcomes were 24-hours postoperative opioid consumption and the incidence of postoperative nausea and vomiting (PONV).
RESULTS: There was a trend towards lower VAS scores for both techniques compared to the control group(no block 6.40 ± 1.73, PECS1–ESB 4.20 ± 2.53 and PECS2 3.60 ± 2.01 ; P=0.167 and P=1,000 respectively). Postoperative intravenous morphine consumption, was reduced by 43% in the PECS1–ESB and by 56% in the PECS2 compared to no block (oral morphine equivalents: no block 16.05 ± 6.79mg PECS1–ESB 9.05 ± 6.48mg, PECS2 7.00 ± 6.16; ; P=0.02 and P=0.003 respectively) The trend towards less PONV for both techniques compared to the control group was not statistically significant(no block 30% PONV, PECS1-ESB 20%, PECS2 0%, P=0.152).
CONCLUSIONS: Both the PECS1-ESB and the PECS2 group showed a significant reduction in opioid consumption of 43% and 56% respectively. This reduction was obtained with a simultaneous trend towards lower VAS scores and PONV. This trend was not statistically significant, which might be due to the small sample size.

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Enhanced recovery after surgery following elective surgery of abdominal aortic aneurysms: an egyptian center experience

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BACKGROUND: The enhanced recovery after surgery (ERAS) process is a pathway with multimodal perioperative care emerged to obtain an early postoperative recovery for patients subjected to major open surgery. The purpose of this study was to discuss the differences in length of hospital stay (LOS) between patients obtained standard perioperative care and patients subjected to an ERAS program who underwent elective open abdominal aortic aneurysm (AAA) repair.
METHODS: Between January 2008 and December 2016, a retrospective observational study took place. The incidence of postoperative complications between patients receiving the ERAS process and patients receiving standard perioperative care was reported. Moreover, the length of hospital stay, unplanned admission to the intensive care unit, surgical redo, and in-hospital mortality between groups were also reported. To reduce the bias, propensity score matching was performed from comparing outcomes among those receiving ERAS versus those that did not.
RESULTS: A total of 140 open infrarenal AAA repair were performed during the study period. Seventy patients received standard perioperative medical care while the other seventy underwent the ERAS programme. Propensity score matching revealed that no statistical differences in postoperative cardiovascular and pulmonary complications (P>0.001). On the other hand, there was a significant reduction in postoperative gastrointestinal, pulmonary, and urinary tract complications (P<0.001).
CONCLUSIONS: Enhanced recovery after surgery program is a reli-

able, applicable, and effective modality in reducing postoperative gastrointestinal, pulmonary, and urinary tract complications. In addition, it helps to reduce the length of hospital stay after elective surgical repair of AAA.

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Risk analysis of increasing in-hospital medical expenses in abdominal aortic aneurysm repair

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BACKGROUND: Since the introduction of endovascular aortic repair (EVAR), clinical results and cost effectiveness of the procedure (*i.e.* EVAR *vs.* open repair) for abdominal aortic aneurysm (AAA) has been reported in several clinical trials, but the results are controversial for now. Therefore, in this study, we analyzed the risk for increasing medical expenses in AAA repair.
METHODS: All isolated AAA repairs performed at our institution in the period of 2007-2017 were identified. The average hospital medical cost (AVE) and its standard deviation (SD) of overall cases were 3,324,386JPY and 1,707,306JPY, respectively. We defined the patients with more than AVE + 1SD (*i.e.* 5,031,692JPY) as high medical expense group (group H: N.=36). Then we compared patients' characteristics and post-operative clinical conditions of group H with low medical expense group (group L: less than 5,031,692JPY, N.=534).
RESULTS: With regard to patients' characteristics, significant difference in maximum diameter of aneurysm, RBC counts, and C-reactive protein were found between group H and L. Rate of emergency repair was higher in group H (50% *vs.* 5%). The history of coronary artery disease (CAD), atrial fibrillation (Af), cerebral infarction (CI), and chronic kidney disease (CKD) was significantly higher in group H. As for operative profiles, lower EVAR treatment, longer operation time (243±109 min *vs.* 174±80 min), more blood loss (2129±3707 ml *vs.* 710±1074 ml), and higher incidence of blood transfusion was found in group H. In-hospital mortality rate of group H was significantly high compared with group L. Longer ICU stay (10±13 days *vs.* 1±2 days) and postoperative hospital stay (59±54 days *vs.* 13±32 days) were found in group H.
CONCLUSIONS: In the present study, it was suggested that the emergency case, presence of co-morbidities, or post-operative complications would increase in-hospital medical expenses.

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Association between malnutrition and out-of-hospital mortality in vascular surgery patients

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BACKGROUND: Vascular surgery patients have high rates of malnutrition during hospital admission. The effects of this nutritional status on morbidity and mortality in this population, especially after hospital discharge is not well documented. We sought to determine the impact of nutritional status on out-of-hospital mortality in vascular surgery patients.
METHODS: We performed an observational cohort study of non-cardiac vascular surgery patients surviving hospital admission 18 years or older treated in Boston, Massachusetts, USA. The exposure of interest was malnutrition categorized as nonspecific malnutrition, protein-energy malnutrition, or well nourished. This was determined by data related to anthropometric measurements, biochemical indicators, clinical signs of malnutrition, malnutrition risk factors, and metabolic stress. The primary outcome was all cause 90 day mortality after hospital discharge. Adjusted odds ratios were estimated by multivariable logistic regression models.
RESULTS: This cohort included 5561 patients (male 53%; mean age 60.1±17.2). The re-admission rate within 30 days and the mean length of stay was 6 days (IQR 2-13). After evaluation by a dietitian 4155 patients were well nourished, 475 patients were at-risk for malnutrition, 821 had non-specific malnutrition and 110 patients had protein-energy malnutrition. After adjustment for age, gender, medical versus surgical patient type, type of vascular surgery, Deyo-Charlson index and length of stay, the 90-day post-discharge mortality odds ratio for patients with risk of malnutrition was 2.22 (95% CI, 1.61-3.06); for non-specific malnutrition OR 3.01 (CI 2.34-3.88) and for protein-energy malnutrition OR 3.53 (95% CI 2.22-5.63), all relative to patients without malnutrition.
CONCLUSIONS: Nutritional status is a reliable indicator for out-of-hospital mortality. In-hospital and out-of-hospital dietary guidance and interventions could potentially improve the prognosis of patients after vascular surgery or endovascular intervention.

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Short-term assessment of intrinsic coagulation factors and endothelial hemostatic markers in patients with peripheral atherosclerosis

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BACKGROUND: to study the activity of intrinsic pathway coagulation factors and endothelial hemostatic markers in patients with peripheral arterial disease (PAD).
METHODS: 120 patients with Fontaine stage IIb-III atherosclerotic PAD were divided into 3 groups. Patients in group A underwent open bypass surgery with synthetic grafts, in group B – endovascular treatment, in group C – conservative treatment. Peripheral blood samples were drawn for the evaluation of the activity of factors VIII, IX, XI, von Willebrand factor (vWF), nitric oxide (II) metabolites, plasminogen activator inhibitor-1 (PAI-1), and soluble endothelial protein C receptor (sEPCR) at baseline at 3 months after intervention.
RESULTS: at baseline patients in groups A and B had elevated levels of factors VIII, IX, XI, vWF, PAI-1, and sEPCR, and lower levels of NO metabolites as compared to normal values. Patients in group C had elevated median values of all studied parameters except for factor VIII and NO metabolites. Five patients in group A (12.5%) developed thrombotic complications at 6 months after open reconstructions. At 3 months after surgery these patients had a further increase of activity of factors VIII, IX, and vWF as compared to other patients in group A, the differences were not statistically significant (P=0.37). Six patients (15.7%) in group B developed restenosis at 6 months after endovascular treatment. Statistically significant increase in vWF activity and decreased levels of NO metabolites at 3 months after intervention were observed in subjects with restenosis (P=0.02). Three patients in group C (7.5%) with elevated activity of PAI-1 at baseline had progression of PAD at 6 months (P=0.027).
CONCLUSIONS: PAD was associated with increased activity of factors VIII, IX, XI, vWF, PAI-1, and sEPCR. Progression of PAD was associated with higher levels of PAI-1, development of restenosis – with increased activity of vWF and lower levels of NO metabolites.

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Regional oximetry changes after below the knee revascularization

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BACKGROUND: Direct revascularization of ischemic foot zone results in twofold increase in probability to heel the ulcer. However direct revascularization is not always easy or possible. Moreover, it is possible to recanalize up to three below the knee (BTK) arteries, but extensive amount of contrast media and X-ray exposure are used. There is an ongoing search for quantitative methods which could evaluate blood circulation and detect sufficient blood flow in the ischemic region during the revascularization procedure. TcpO2, 2D angiography, micro-oxygen sensor, laser doppler and other methods have been used for this purpose with limited success. The aim of our study was to evaluate the relevance of near infrared spectroscopy (NIRS) in below the knee artery during revascularization procedure.
METHODS: We used INVOS™ Cerebral/Somatic Oximetry, which is non-invasive and is based on NIRS. It has CE mark for cerebral and somatic use, however there is no defined oximetry changes in critical limb ischemia, particularly during revascularization. We were granted regional bioethics committee license for our investigation. Pilot study was planned to describe the pattern of oximetry changes during endovascular recanalization of BTK arteries. We performed 20 procedures in 20 patients.
RESULTS: Revascularization effect is visible in INVOS monitor 1-2 minutes after blood flow is restored. Low oxygen saturation (<85% using standard pulse oximeter) makes NIRS not useful. Preliminary results show, that at least 10% increase in tissue oxygen saturation results in beneficial clinical outcomes NIRS is highly valuable for detection of early recoil during/after the procedure.
CONCLUSIONS: NIRS method seems to be very promising for evaluation of blood flow during revascularization procedure. We have started a new clinical study based on the results we have found. Three threshold limits of 10%, 15% and 20% of tissue oxygen saturation increase during procedure will be evaluated to predict good clinical outcome.

Thursday May 23, 2019
16:30 - 18:00

Vascular Abstracts Session 5: Miscellaneous

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Vascular surgery patients at risk for malnutrition have an increased risk for postoperative complications

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BACKGROUND: Malnutrition is an important risk factor for adverse postoperative outcomes, including infection and delayed wound healing, resulting in a longer hospital stay and higher readmission and mortality rates. The aim of this study was to assess the relationship between the risk for malnutrition prior to elective vascular surgery and postoperative complications.
METHODS: Patients were assessed for risk for malnutrition by the Patient-Generated Subjective Global Assessment Short Form. Postoperative complications were registered and analyzed using the Comprehensive Complication Index. Uni- and multivariate analyses were performed to identify the relationship between risk for malnutrition and postoperative complications.
RESULTS: Of 468 patients, 113 (24.1%) were found to be at risk for malnutrition. The occurrence of post-operative complications (P=0.006), the length of hospital stay (P=0.005) and the Comprehensive Complication Index (P=0.018) varied significantly between the different risk for malnutrition groups. After adjusting for confounders, the 'medium risk for malnutrition' group had a 1.39 (95% CI: 1.05-1.84) times higher Comprehensive Complication Index than the 'low risk for malnutrition' group (P=0.020).
CONCLUSIONS: Electively operated vascular surgery patients with a medium risk for malnutrition are more likely to develop postoperative complications. This finding suggests that preventive interdisciplinary interventions are needed in vascular surgery patients to improve nutritional status and reduce the complication risk.

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The effects of mental fatigue on surgical performance a systematic review

Iris Reijmerink[1], Anne-Fleur Thé[1], Bas Gloudemans[1], Annelies Klaassen[1], Fokie Cnossen[2], Maarten van der Laan[1]
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BACKGROUND: The effect of mental fatigue and sleep deprivation on surgeons has been questioned for decades. While other high-stake professions such as aviation have already established guidelines to restrict work hours, this trend has yet to reach the surgical profession. This study aimed to give a complete and up-to-date overview of the existing literature, in order to facilitate further research and the development of guidelines.
METHODS: A systematic review was performed. 31 studies regarding the relation between fatigue and surgical performance, using both real-life surgery and simulator studies, were included. A quality assessment was done using the Newcastle-Ottawa Scale.
RESULTS: None of the studies on real-life surgery found a correlation between fatigue and surgical performance, but 45% of simulator studies found a negative correlation between fatigue and surgical performance, and 22% of simulator studies found a positive correlation. 15% of surgeon-based studies found a negative correlation, while 33% of intern-based studies did.
CONCLUSIONS: In simulator studies, the effects of fatigue were mixed, but in real-life surgery, fatigue appears not to affect surgical performance. An explanation for this difference between simulator and real-life studies may lie in the fact that in real-life operations the stakes are higher and surgeons put in more effort to protect their performance against the detrimental effects of fatigue. However, surgical performance measures were found to be rather crude, so it is unclear whether these measures were sufficiently sensitive to detect effects of fatigue if they do exist. We argue for finer-grained performance measures in future research.

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Safety of absorbable wire in vascular suture

Hanna Barjoud
Polyclinique de Picardie, Amiens, France

BACKGROUND: 10 years' experience of vascular sutures with slow resorbable wires with more than 1000 sutures. I would like to bring my

experience of vascular sutures (vein-vein, vein-artery and artery-artery) with a resorbable thread for more than 10 years.
METHODS: I use the slow absorbable thread in all the sutures that are at the lower limbs, digestive, carotid, or other.
RESULTS: I think that the sutures of biological tissues are strong and durable with a significant advantage over patency. The risk of early ruptures on 1000 sutures is zero, false aneurysm complications are exceptional at less than 0.5%. In particular I studied the interventions carried out on carotid arteries that are thromboendarteriectomies or venous bypass on 300 interventions. There were no ruptures, no false aneurysms and 3 restenosis at 3 years after the initial surgery, treated by dilatation or repair of a bypass. Thrombosis at one month: a single case related I believe in result of a small saphenous vein.
I use this method of sutures, especially also in the distal venous bypass on leg arteries 2 mm in diameter, and it gives me better short and long term patency. The risk of intimal hyperplasia related to the presence of the wire (foreign body) is zero.
CONCLUSIONS: I recommend the use of resorbable threads in any suture of the biological tissue.

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Demographics and risk factors in patients with abdominal aortic aneurysm in three different geographic regions

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BACKGROUND: The patients with abdominal aortic aneurysm (AAA) have a number of comorbidities and risk factors that significantly affect the results of treatment and survival. In addition, some comorbidities might also increase the progression of AAA. There are limited data on demographics, the prevalence of comorbidities, and risk factors in patients with abdominal aorta aneurysm in different geographical regions. The aim of the study is to compare the demographics, comorbidities and risk factors in patients with AAA treated in three different communities; Cologne (Germany), Dushanbe (Tajikistan) and Ryazan (Russia).
METHODS: A retrospective comparative study including patients, with an infrarenal AAA who were treated with either EVAR or open repair between 2011-2015 has been performed. There were a total number of 711 patients, 499 from Cologne, 46 from Dushanbe and 166 from Ryazan.
RESULTS: There was no statistically significant difference in AAA occurrence with respect to gender between the study centers. The patients from Cologne were older than those from Dushanbe and Ryazan. Moreover, the rate of ruptured aneurysm was significantly lower in Cologne. The AAA diameter of patients in Ryazan and Dushanbe was greater than in Cologne. Antiplatelet-aggregation medication (aspirin), statin and beta blockers were used significantly more often in patients in Cologne. Patients from Tajikistan had more COPD than patients from the other centers. Furthermore, the presence of coronary artery disease and arterial hypertension was lower in Cologne in comparison to the other two centers.
CONCLUSIONS: The rates of comorbidities, risk factors as well as medication in patients with infrarenal abdominal aortic aneurysm are different in the various geographical regions studied.

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Is there any correlation between atmospheric pressure and the incidence of abdominal aortic aneurysm rupture?

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BACKGROUND: Often over the years, aneurysm of the abdominal aorta and its rupture have been studied, and a number of risk factors for the abdominal aortic aneurysm rupture have been discussed, such as hypertension, chronic obstructive pulmonary disease, nicotinism, among others the change in atmospheric pressure. The influence of atmospheric pressure has not yet been sufficiently explored, although there has been a study of its possible impact on the rupture of aneurysms. The aim is to establish the presence of comorbidity, as well as the impact of atmospheric pressure on the icidence of abdominal aortic aneurysm rupture.
METHODS: All patients who were operated rupture of aneurysm of the abdominal aorta at the Clinic for Vascular and Endovascular surgery of the Clinical Center of Vojvodina in the period from 01.01.2014. until 01.12.2018. are included in this study. The analysis was retrospective. We used history of patient illnesses, medical documentation (computer data, accompanying clinical documentation, discharge lists) for obtaining data. Data of atmospheric pressure on the territory of Vojvodina are collected from the Republic Hydrological Institute of Serbia.
RESULTS: It has been found that the number of cases with rupture of aneurysm of the abdominal aorta is higher during higher atmospheric pressure than expected for altitude in the territory of Vojvodina, even in 95% of cases, most often in autumn.
CONCLUSIONS: We concluded that there is a significant correlation between hight atmospheric pressure and the incidence of abdominal aortic aneurysm rupture, the exact mechanism of this influence remains to be studied in some further studies.

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Further evidence on the relationship between abdominal aortic aneurysm and periodontitis

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BACKGROUND: Abdominal aortic aneurysm (AAA) is an inflammatory chronic disease characterized by the destruction of the aortic wall and the presence of an intraluminal thrombus. Chronic bacteremia and metastatic infection consecutive to periodontitis is hypothesized to be related to AAA physiopathology. Aim: to explore the potential relationship between the severity of periodontitis and AAA progression.
METHODS: This cross-sectional study compared a group of patients with stable AAA (N.=31) and a group of patients with unstable AAA (N.=30). AAA stability was based on aortic diameter and disease progression . AAA diameters, volumes and heights were obtained from CT-scans (N.=52) or ultrasonography (N.=9). Periodontal severity was assessed by clinical parameters such as probing depth (PD) whereas

the risk of infectiousness was evaluated by the PISA and PIRI scores. Microbiology was performed on saliva, supra- and sub-gingival plaque and quantification of Tannerella forsythia (Tf), Porphyromonas gingivalis (Pg) Aggregatibacter actinomycetemcomitans (Aa), Fusobacterium nucleatum (Fn) and Prevotella intermedia (Pi) was done by qPCR.
RESULTS: The two groups were homogeneous for age, gender and most risk factors except hypertension and COPD. By definition they differed with respect to AAA severity. Dental characteristics were perfectly superimposable. Periodontal parameters were comparable but the PIRI score was worse in AAA unstable patients. PD and the proportion of PD > 6mm were positively correlated with AAA size and thrombus volume. Periopathogens were found in all patients; while Pn were more numerous in AAA unstable patents, Aa pathogens were more numerous in AAA stable patients. Pg in saliva and sub-gingival plaque were also found significantly correlated with the antero-posterior and cross-sectional AAA diameters.
CONCLUSIONS: Periodontitis severity was correlated with AAA size and volume and therefore could participate to the physiopathology and progression of AAA.

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Midterm outcomes of endovascular aneurysm sealing with parallel grafts: not a durable solution

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BACKGROUND: Chimney grafts are placed parallel to an aortic stent-graft to maintain perfusion through visceral branches. When used in combination with endovascular aneurysm repair (EVAR), there is a significant risk of "gutter" type 1 endoleaks. In combination with endovascular aneurysm sealing (EVAS), this risk may be reduced as the polymer within the endobags conforms to the shape of the chimney stents, whilst maintaining a proximal seal at the aneurysm neck. EVAS with chimney stents (ChEVAS) may represent an alternative to fenestrated EVAR (FEVAR) for the treatment of juxtarenal abdominal aortic aneurysms (AAA).
METHODS: Detailed pre-, peri- and postoperative data were collected for each patient undergoing the ChEVAS procedure.
RESULTS: 79 cases are reported in patients with a mean age of 75.2 years. All patients had juxta- or suprarenal aneurysms. 33 patients were treated with 1 chimney stent, 26 with 2 and 20 with 3. Chimney stent patency is 97.8%. Freedom from all-cause mortality (ACM) was 81.5% and 73.1% at 2 and 4 years (P=0.533). Freedom from aneurysm-related mortality (ARM) was 90.9% and 86.8% at 2 and 4 years. A composite measure of graft failure, comprising secondary sac rupture, type 1a or 1b endoleak, stentgraft migration or sac expansion greater than 5 mm, occurred in 19 cases (24.1%) at a rate of 12.88 per 100 patient-years. Reintervention was required in 13 cases (16.5%), or 8.81 per 100 patient-years. The number of chimney grafts did not have a statistically significant impact on any of the postoperative complications.
CONCLUSIONS: Early results for ChEVAS suggested it was an effective treatment for complex aneurysms not treatable with more conventional endovascular methods. The midterm results are almost identical to those for the infrarenal EVAS device, with the same modes of failure being apparent, largely in the form of migration with type 1a endoleak and sac expansion.

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Contrast enhanced ultra sound for EVAR monitoring: a safe method for patients and operators

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BACKGROUND: EVAR (EndoVascular Aortic Repair) is a first line therapy for abdominal aortic aneurysms (AAA) treatment. A frequent post-operative complication is endoleak (EL) that occurs when blood leaks back into the aneurysm sac. Type II endoleaks are the most frequent complications and they often require lifelong surveillance. Nowadays Computed Tomography (CT) scan represents the gold standard modality of imaging to detect endoleaks, although Magnetic Resonance Angiography and/or CEUS (Contrast Enhanced Ultra Sound) have an emerging role.
METHODS: Purpose of study is to evaluate the role of CEUS in detecting endoleaks after EVAR in our experience. Between 2013-2018, 103 patients treated with EVAR were collected, the mean follow-up was 25 months; 16 patients have been monitored by CT scan at 1, 6, 12 months and then yearly; 20 patients by CEUS and CT scan at 1 month, subsequently only by CEUS and 52 by CEUS at 1 and 6 months and, in absence of complications, by Ultrasound Scan yearly. During follow-up 2 patients died and 13 patients have been dropped out.
RESULTS: At 1 month CEUS control group showed 14 (13,6%) type II EL and 1 graft thrombosis. All patients with positive CEUS for type II EL have been monitored with regular controls every 3-6 months. We did not report deaths or major complication in patients monitored by CEUS. Among patients with type II EL, 3 underwent embolization with resolution of EL in 2 cases.
CONCLUSIONS: CEUS can provide additional contents in term of pressurization of the sac. The main disadvantages are operator dependency. Experience in ultrasound imaging is needed to avoid interpretative errors. Our results highlight the role of CEUS in EVAR surveillance, compared to CT scan, in terms of low cost, good diagnostic performance, absence of renal impairment and reduction of radiation exposure for patients needing lifelong investigations.

Thursday May 23, 2019
16:30 - 18:00

Cardiac Abstracts Session 3: Mitral Valve Surgery

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Evaluating the impact of valve type choices on patients quality of life: a patients perspective

Philemon Gukop, Rajdeep Bilkhu, Adnan Charaf, Artemis Vafeiadou, Chrysoula Nana, Justin Nowell, Aziz Momin, Robin Kanagasabay, Mazin Sarsam, Venkatachalam Chandrasekaran

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BACKGROUND: Heart valve operations have both clinical and social implications influenced by prostheses choice. EACT/ESC and AHA/ACC: issued class 1 recommendation that prostheses choice/types of operation should be based on a discussion with patients and their voluntary informed choices. Associated risks/benefit of choices should be clear.

This study is the first survey to our knowledge attempting to obtain patients perspective and their experience of this process. Obtaining patients perspective/opinion is essential to planning a good clinical service and will inform the process of consenting. The aim is to assess the extend to which patients voluntarily choose their valve types/operations; and to assess patients satisfaction with information received about their valve operations and to evaluate the impact of valve type/operation choices on the quality of life from the patient's perspective.
METHODS:Anonymous questionnaire was prospectively administered to 198 consecutive valve surgery patients at follow-up clinic to obtain their opinion/experience following surgery. Data is presented as median interquartile range.
RESULTS: N.=198. age(yrs): 70 (56-75), time since operation (yrs): 2(1-5), valve /operation types: Tissue valves: 84(42.4%), Mechanical valves: 27 (13.6%), valve repair: 87(43.9%). Voluntary choice of valve types/operation: 117(59%); 24(12.1%) felt inadequately informed. 9 (4.5%) regretted having an operation. 23 (11.6%) were on warfarin solely as a result of the operation. 141 (71.2%) were very satisfied with their valve operation. Impact on quality of life: poor sleep due to valve 15(7.6%), negative impact on other medical treatment 18(9%); impact on recreation/sports: 39(19.7%), ability to work: 12(6%), sexual life: 15(7.5%), diet restriction: 6(3%).
CONCLUSIONS: Heart Valve type choices have significant social and clinical implications and impact on quality of life. There is need for more patients education and room for voluntary choices to enhance satisfaction.

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The novel free margin running suture mitral valve repair technique: three-years follow-up

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BACKGROUND: The free margin running suture (FMRS) or posterior leaflet remodeling is a novel technique for mitral valve repair (degenerative disease). We recently published its features and the initial results in minimally invasive surgery. We provide extended follow-up focusing on repair durability, valve-related events, and early/late mitral hemodynamics.
METHODS: The FMRS allows repair of extensive mitral posterior leaflet (PL) prolapse and tissue excess. It is a non-resection repair also suited for Barlow disease. A Gore-Tex running suture is passed through the free edge of the prolapsing segment(s) until the normal PL segment, which dictates the height of the new coaptation line. Operations were performed through a minimally invasive technique (right minithoracotomy with or without intra-aortic occlusion device). A retrospective review of in-hospital data and prospective clinical/echocardiographic follow-up were obtained for 61 consecutive FMRS recipients.
RESULTS: Average age was 60.5±12 years. There was no operative mortality. Average cardiopulmonary bypass and aortic clamp time were 131±16.6 and 108.7±15.6 minutes, respectively. At discharge, residual mitral regurgitation was trivial in 16.4%, mild in 3.3% and none in the remainders. Average mitral valve area, mean gradient and coaptation length were 3.1±0.2 cm², 5.2±1.6 mmHg and 1.3±0.2 cm, respectively. Follow-up duration was 40.2±30 months (100% complete). There was no late mortality, two non-valve-related adverse events and no valve-related adverse events. Residual mitral regurgitation at follow-up was trivial in 31.1% of cases and none in the remainders. At follow-up echocardiography, average mitral valve area, mean gradient and coaptation length were 3.1±0.2 cm², 3.8±0.9 mmHg and 1.4±1 cm, respectively (P=0.6, P<0.001 and P=0.5, respectively).
CONCLUSIONS: The FMRS, a novel concept for mitral repair, confirms its feasibility for the treatment of degenerative mitral disease, with optimal durability at mid-term and good coaptation length. Echocardiography (mitral gradient and surface area) suggests optimal diastolic performance, to be compared with resection-based techniques.

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The mitral valve reconstruction by using pre-measured gore-tex loops

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BACKGROUND: We assessed the earlyterm outcomes for the loop technique in patients with mitral valve prolapse.
METHODS: A total of 90 patients (60 male,30 female) underwent mitral valve repair with Gore-Tex loops for severe degenerative valve incompetence. 2 of these patients have the Marfan syndrome. The mean age was 50 ± 13, the mean preoperative ejection fraction was 65,2 ± 8,3%, the mean NYHA functional class was 3,21 ± 0,7 and the mean logistic EuroSCORE was 3,02% ±2,85. Posterior mitral leaflet prolapse was diagnosed in 16 patients, anterior leaflet prolapse - in 12 patients, both leaflet prolapse - in the remaining 62 patients.
RESULTS: All patients receiwed the loop technique and the ring annuloplasty, with a mean ring size 32,4 ± 2,37 mm. In 21 patients loops were used for the posterior leaflet only, in 33 patients for the anterior leaflet only, and in 36 patients for both leaflets. Quadrangular resection was performed in 27,78% of cases. Sliding annuloplasty was performed in 14,44% of patients. The associated procedures included tricuspid valve reconstruction (65 patients – 72,22%), myocardial revascularization (15 patients – 16,67%), David-1 procedure (12 patients), atrial fibrillation ablation (3 patients).
No patient died early postoperatively. Thirty-day survival was 100%. Predischarge echocardiography revealed trace or mild mitral regurgitation in 100% patients. The mean mitral regurgitation grade decreased from 3,48 ± 0,71 at baseline to 0,58 ± 0,37 before discharge. The mean coaptation lengths among all patients were 10,89± 2,3 mm, the mean coaptation depth - 4,82 ± 2,17mm.
CONCLUSIONS: Multicomponent mitral valve reconstruction involving the creation of multiple neo chords provides excellent hemodynamic effect. 2. The use of resection techniques is necessary in patients with excess tissue of the posterior mitral valve.

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Mitral and tricuspid valve surgery in patients with ischemic versus non- ischemic functional regurgitation

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BACKGROUND: Do preoperative data and surgical treatment is different in patients with functional mitral and tricuspid regurgitation regarding to ischemic (I-MR) or dilated (D-MR) ethiology?
METHODS: We prospectively include 1049 operated patients with functional mitral and tricuspid regurgitation. Isolated valve surgery or combined with CABG was performed. The prevalent etiology was coronary artery disease (910 patients, 86,7%). I-MR group was a significantly older (62.0±8.3 *vs.* 52.3±10.1, P <0.001) and had higher surgical risk

(EuroSCOREII 5,4 (LQ2,47/HQ6,47) *vs.* 3,4 (LQ2,3/HQ5,0), P=0.017). RESULTS: In-hospital mortality was low but significantly higher in ischemic etiologies (4,0% *vs.* 0,7%, P=0.54). Mitral and tricuspid regurgitation were more significant in D-MR grope (2,91±0,77 *vs.* 3,45±0,67 and 2,16±0,82 *vs.* 2,68±0,77 correspondingly, P<0.001). LV systolic function was more depressed in D-MR pts (LVEF 30,12±7,05% *vs.* 39,05±10,02%, P<0.001). RV function was also worse in D-MR pts with TAPSE 10,2±2,05 *vs.* 15,6±5,05 in I-MR group (P=0.024). Significant reduction of MR and TR severity was observed immediately after valve repair (2,7 ± 0,52 *vs.* 1,01±0,56 gr. before and after surgery correspondently, P<0.001). But in D-MR group concomitant correction of TR was done more often (91,4% *vs.* 53,6%, P <0,001). Moreover the rate of mitral valve replacement *vs.* repair was higher in D-MR group (20,9% *vs.* 12,5%, P=0.005). Paired echocardiographic data showed a persistent improvement of MR at 1 year but incidence of moderate or severe mitral regurgitation even in the ring annuloplasty group was high (14,8 % and 23,4 % at discharge and in 1-year after surgery correspondently, P<0.001).
CONCLUSIONS: In patients with ischemic functional mitral and tricuspid regurgitation more advanced clinical status was reported. But LV and RV function were lower in non-ischemic group with more significant MR and TR. Concomitant TR correction during primary surgery was performed twice often in non-ischemic patient with functional MR.

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Simplified artificial chordae implantation technique facilitates mitral valve repair: a two-year single surgeon experience

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BACKGROUND: Many techniques in mitral valve repair (MVR) have been reported with successful long-term results. The aim of this study is to present our simplified technique in artificial chordae replacement for mitral valve repair, and reporting its short- to mid-term results.
METHODS: We present a prospective single-surgeon experience. A modified artificial chordae implantation technique has been used to repair mitral valves. Postoperative echocardiography at 0, 6, then every 12 months is used to control the results. Endpoints involved freedom from mitral regurgitation, reoperation and major adverse cardiac and cerebrovascular events.
RESULTS: Between 01/2016 and 01/2018, 58 consecutive patients underwent MVR using this modified technique, are evaluated. Mean age was 63.6±10.1 years and 76.2% were male. Mitral valve pathology was mainly degenerative in 52 (89.7%) patients, endocarditis in 5 (8.6%) patients and papillary muscle rupture in one patient. Besides chordae replacement (mean number 3.6±1.1 per patient), annuloplasy was used in all patients to correct annulus dilation and stabilize the repair. Mean cross-clamping time was 69.4±31.1 minutes. Postoperative outcomes reported an incidence of stroke in one patient, low output syndrome in two patients and three mortalities. Discharge echocardiography reported moderate mitral regurgitation (MR) in one patient but no severe MR. Follow-up results within a mean of 19.3±8.5 months reported no significant mitral regurgitation or need for reoperation. One patient developed stroke, another patient had myocardial infarction, two patients needed coronary intervention and three more mortalities (all non-cardiac) were reported.
CONCLUSIONS: Our modified implantation technique simplifies MVR, it allows to reduce the number of used chordae and re-correction if needed, which consequently reduces cross-clamping and bypass time, especially in endoscopic MVR. Good intraoperative and short- to mid-term results are reported. However, these results are still under investigation including a larger cohort to prove long-term stability of the repair.

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Prospective study of patients with moderate ischemic mitral regurgitation, management strategies and outcome

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BACKGROUND: The optimal management of moderate ischemic mitral regurgitation (IMR) remains controversial. This study investigates the fate of moderate IMR if addressed or not and its clinical implications.
METHODS: A single institution prospective study from February 2011 to February 2014 on all consecutive patients undergoing coronary artery bypass grafting (CABG group) alone or with mitral valve intervention (CABG + MVR group) for moderate IMR. Early mortality/ late mortality/MACCE/progression of IMR / left ventricular (LV) remodeling (LVIDD and LVIDS) and functional class were analyzed till last follow-up. Cox and Survival analysis were performed.
RESULTS: The total number of study subjects is N.=73 in CABG treatment group and N.=24 in CABG + MVR treatment group**.** The two groups were similar in demographics and preoperative clinical data. The mean duration of follow-up is 21.18 ± 9.91 months in the CABG treatment group and 26.62 ± 10.34 months in the CABG + MVR treatment group. The early mortality is 1.37 % *vs.* 12.5 % between the two groups respectively. There was no late mortality in both groups. Patients in CABG + MVR treatment group had statistically significant improvement in ejection fraction (EF) 6.32± 7.22 *vs.* 4.31 ± 8.90(p 0.0125)/ NYHA Class 1.00 ± 0.67 *vs.* 0.60 ± 0.980 (P .0438)/ MR Jet area 5.89 ± 1.32 *vs.* 1.94 ± 2.89 (p 0.0001) at follow-up when compared to CABG group. CABG + MVR Group also had better left ventricular remodelling- reduction in LVIDD of 2.26 ± 3.43 *vs.* 0.82 ± 6.07 (p 0.1817) and LVIDS of 2.63 ± 6.91 *vs.* 1.30 ± 10.08 (p 0.5058).
CONCLUSIONS: CABG+ MVR group had higher early mortality without an increase in late mortality. At follow-up, significantly greater improvement in NYHA functional class, LV EF and decrease in IMR is seen with addition of mitral intervention.

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Risk assessment of mitral regurgitation in non-regurgitant mitral valves based on structural mitral valve reserve

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BACKGROUND: Mitral valve (MV) maintains systolic competence with a complex interaction of components of the MV apparatus (MVA). There is structural redundancy (reserve) in the MVA to sustain ischemic remodeling and prevent development of mitral regurgitation (MR). Based on the available reserve, non-regurgitant MV's could vary in

their risk of developing MR. Objective is to demonstrate that due differences in structural MV reserve (MVRes) there is variation in the risk of developing MR in non-regurgitant MV's in ischemic cardiomyopathy.
METHODS: Intraoperative 3D transesophageal echocardiographic images of the MV were acquired in patients undergoing elective CABG with no MR (NMR-group) and with ischemic MR (IMR-group). Inclusion criteria for NMR-group included normal bi-ventricular systolic and valvular structure and function and moderate or more MR in the absence of any structural abnormality for IMR-group. Using 3D-data MVRes was calculated for both groups
RESULTS: There was significant regional heterogeneity in the MVRes across the three regions of the MVA in both groups. In the NMR-group, region 2 demonstrated the largest MVRes. NMR-group had a larger MVRes than the IMR-group in regions 1 and 2 and comparable MVRes to the IMR group in region 3. Posterior displacement of coaptation point in regions 2 and 3 was demonstrated by a significantly larger AL/PL ratio in both groups. There was a negative correlation between MV reserve and AL/PL ratio in regions 2 and 3 in both the IMR and NMR-group.
CONCLUSIONS: Non-regurgitant MV's vary in their risk of developing MR. Depletion of structural-reserve is a regional phenomenon with postero-medial portion of the NMR MV's at most risk of coaptation failure. Depletion of MVRes is demonstrated by progressive posterior displacement of the coaptation point. Absence of significant MR in NMR MV's in ischemic cardiomyopathy does not imply normal MV function.

Thursday May 23, 2019
16:30 - 18:00

Best Cardiac Poster Session

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The efficacy of box lesion+ procedure in patients with atrial fibrillation: three year follow-up results

Oleg Sapelnikov[1], Dmitrii Cherkashin[1], Igor Grishin[1], Andrey Shiryaev[1], Olga Nikolaeva[1], Darin Ardus[2], Renat Akchurin[1]

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BACKGROUND: As we know, MAZE procedure is an effective surgical method in atrial fibrillation (AF) treatment. Moreover, nowadays we are all aware of its modifications. We conducted comparative analysis of two cryoablation approaches during MAZE procedure: long-term results.
METHODS: Fifty-two (52) patients with atrial fibrillation (AF) and concomitant coronary artery disease or mitral valve disease, were included in the study. Average age was 60,1±10,25 years, prevalence of men was admitted (59,6%). In all cases we performed cryoballoon ablation during MAZE procedure with one-time myocardium revascularization or mitral-valve surgery. All patients were divided into 2 groups according to Cryo MAZE procedure type – one group underwent pulmonary vein (PV) isolation with line at left atrium roof and ablation of mitral isthmus (L1), another group of patients had additional isolation of LA posterior wall.
RESULTS: It is worth mentioning that both groups were comparable including the majority of demographic characteristics. Isolation of posterior wall didn't prolong the operative time and artificial circulation significantly. In this way, MAZE procedure itself lasted 18±1,7 min in the first group and 20±2,1 min in the second group (P – 0.398); the whole operative time was 192±24 min and 199±19 min (P – 0.435) and artificial circulation time was 103±12 min and 104±10 min (P – 0.547). In 12 months,group of additional posterior wall isolation had no AF recurrences in 81,8% versus 57,9% (P – 0.087), and by third year of follow-up the efficacy of ablation in the second group significantly exceeded results of the first group (75,8% versus 47,4 % P – 0.048).
CONCLUSIONS: Isolation of the left atrial posterior wall may considerably improve the efficacy of surgical treatment, which was demonstrated in significant decrease of AF recurrences during the whole follow-up period.

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Risk stratification of patients with reduced ejection fraction. Biomarker of cardiac remodeling and injury

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BACKGROUND: Only clinical risk factors alone are used in current preoperative models estimating risk of hospital mortality following cardiac surgery. Biomarkers potentially can improve the predictive ability and capacity to risk stratify patients before cardiac surgery.
METHODS: 358 patients with severe depressed LV function (EF < 35%) and non-acute functional mitral regurgitatio were included in the prospective study. Cardiomyopathy was ischemic (CAD) in 301 patients or non-ischemic (IDCP) in 57 patients (mean age 62,2±4,9 *vs.* 44,4±9,9 years). Patients underwent either combined CABG with mitral valve procedure (193 patients) or isolated mitral-valve repair or chordal-sparing replacement (94 patients) consequently. Plasma levels of cardiac biomarkers (ST2, NT-proBNP, hs-cTnI and Galectin-3) were measured preoperatively and at 1st, 7th and 30th postoperative days.
RESULTS: LV EF were significantly worse in patients with IDCP compared with CAD (28±4,4 % *vs.* 36±3,9 %, P=0.024). Higher baseline levels of NT-proBNP were observed in patients with dilated cardiomyopathy (1801 (LQ1109/HQ4451) *vs.* ischemic heart diseases 1361 (LQ631/HQ3104) pg/ml, P=0.016). There were statistically significant increases for NT-proBNP and hs-cTnI level at first postoperative day regardless from aetiology (6541,5 (LQ5041,5/HQ12225,0) pg/ml *vs.* 6623 (LQ3524,25/HQ10910,25) pg/ml, P=0.87). At first 24 h only 3,8 % have shown hsTnI level less than 10 times of the 99th percentile upper reference limit (URL). In patients with abnormal preoperative level of hsTnI with at least one value above the 99th percentile URL significant elevated NT-proBNP level was detected (2297 (LQ884/HQ6188) *vs.* 1362,5 (LQ642,7/HQ2830,5), P=0.006).
CONCLUSIONS: Ischemic and non-ischemic patients exhibited biphases acute changes in plasma NT-proBNP and hsTnI with significant increase immediately after operation. Combining TnT and NT-proBNP will result in an improved prognostic risk estimation after cardiac surgery, due to the fact that this approach considers cardiac dysfunction as well as myocardial injury as triggers.

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Aortic valve constructon, early results – single surgeon experience

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BACKGROUND: The use of pericardium has been widely adopted in different procedures involving reconstruction of heart valves. In 2010,

aortic valve construction (AVC) has been re-introduced by Ozaki. The exact size of the new cusps is considered the recipe of success for such procedure. We aimed to present our early experience of aortic valve construction using a newly designed templates and tools.
METHODS: Between 09/2015 and 12/2018, 107 patients (age 58±14,) undergoing AVC using either autologous (62, 57.9%) or tissue-engineered pericardium (TEP) (45, 42.1%) as isolated (44, 41.1%) or combined procedure (63, 58.9%). A modified sizing technique with specially designed templates and coaptation forceps has been used. Echocardiographic follow-up is performed at discharge, 6 and 12 months later. Primary endpoints: MACCE and early mortality. Secondary endpoints: freedom of re-operation and 1-year mortality.
RESULTS: Early results reported stroke in 3 (in 2 resolved completely) and 30-day mortality in 4 (due to comorbities) patient respectively. A total of 8 patients needed a re-operation due to endocarditis (4 had positive bacteremia and 4 had only excessive collagen accumulation on all cusps - TEP). Most recent echocardiography reported well-functioning neo-Valve in 87 patients, 3 have trace and 2 has mild aortic regurgitation. The mean value of the mean transvalvular gradient is slightly increased from 4.9mmHg at discharge to 5.4mmHg in last echocardiography. A mean follow-up of 16.2±6.2 months is recorded till now. Finally, One-year mortality reported 4 patients (all non-valve related).
CONCLUSIONS: Aortic valve construction using pericardial tissue is a feasible procedure. This procedure could offer a good alternative for young patients especially with small aortic annulus. The newly designed templates and forceps allow an exact measuring and cutting of the cusps and optimal commissure implantation. A larger cohort with regular echocardiography control is needed to assess the durability of the constructed valves.

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Probe-design: heart rehabilitation in patients awaiting open-heart surgery preventing complications and improving quality of life

Johanneke Hartog, Fredrike Blokzijl, Sandra Dijkstra, Mike de Jongste, Michiel Reneman, Willem Dieperink, Iwan van der Horst, Joke Fleer, Lucas van der Woude, Pim van der Harst, Massimo Mariani

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BACKGROUND: The rising prevalence of modifiable risk factors (e.g. obesity, hypertension, physical inactivity) is causing an increase in possible avoidable complication rates in patients undergoing cardiac surgery (CS). This study therefore aims to assess whether a combined pre- and postoperative multidisciplinary cardiac rehabilitation (CR) program (Heart-ROCQ program) can improve functional status and reduce surgical complications, readmissions and major adverse cardiac events (MACE) as compared to usual care.
METHODS: Patients (N.=350) will be randomized to the Heart-ROCQ program or usual care. The Heart-ROCQ program consists of a preoperative optimization phase during the waiting time (3 times p/week, minimal 3 weeks), a postoperative inpatient phase (3 weeks) and an outpatient CR phase (2 times p/week, 4 weeks). Patients receive multidisciplinary (e.g. physical, dietary, psychological, and smoking cessation) treatment. Usual care consists of 6-12 weeks post-surgery outpatient CR with education and physical therapy. The primary outcome is a composite weighted score of functional status, surgical complications, readmissions and MACE and will be evaluated by a blinded end-point committee. Secondary outcomes are length of stay, physical and psychological functioning, life style risk factors and work participation. Finally, an economic evaluation will be performed. Data will be collected at six time points: at baseline (start of the waiting period), the day before surgery, at time of discharge from the hospital, and at 3, 7 and 12 months after surgery.
CONCLUSIONS: This prospective randomized open, blinded endpoint (PROBE) trial will provide data on the effectiveness of pre- and postoperative multidisciplinary CR in patients awaiting CS.

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From waiting to training: feasibility of pre- and postoperative rehabilitation for cardiac surgery patients

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BACKGROUND: This retrospective observational study aimed to determine the feasibility, defined in terms of the accessibility, compliance, training load and safety of the Heart-ROCQ program, consisting of pre- and postoperative (in- and outpatient) rehabilitation. The Heart-ROCQ program was hypothesized to be feasible.
METHODS: The study included 41 patients scheduled for open heart surgery at the University Medical Centre Groningen, the Netherlands and who followed the Heart-ROCQ program. Outcome measures were percentage of eligible patients following the program, compliance to follow the training sessions, training load of bicycle and strength training and safety of the program.
RESULTS: Of the eligible patients 64% followed the program. During the pre- and postoperative outpatient phase, approximately 69% of the strength and 79% of the bicycle training sessions were followed. Significant increases in training load were seen within each rehabilitation phase. Compared to the last preoperative session, training load of the last postoperative session was significantly lower for strength training, but not significantly different for bicycle training. Regarding safety, there were no reports of serious adverse events.
CONCLUSIONS: The Heart-ROCQ program was feasible in terms of accessibility, compliance and training load. Patients awaiting for cardiac surgery were able to safely exercise preoperatively, increase the training load before surgery and regain it postoperatively.

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Early and long-term efficacy of mitral and tricuspid valve repair for functional ischemic regurgitation

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BACKGROUND: This study is focused on early and long-term efficacy of different types of mitral (MV) or tricuspid (TV) valves repair.
METHODS: 644 patients (mean age, 61,9 ± 7,9 years) with coronary artery diseases and functional ischemic mitral and tricuspid regurgitation were included in prospective study. CABG + different techniques of valves repair were performed. LV and RV remodeling, MV/TV deformation and MR/TR grade by quantitative echocardiography were analysed. Efficacy of valve repair techniques with mean follow-up 5,6 ± 1,7 years were evaluated.
RESULTS: Significant reduction of MR and TR severity was observed immediately after valve repair (2,7 ± 0,52 *vs.* 1,01±0,56 gr. before and after surgery correspondently, P<0.001). But 83 pts (12,6 %) had re-

sidual MR > = 2 gr. even during hospital stay. The rate of significant residual MR was in 6th month – 24,8 %, in 1 year – 28,5 % and in 5 years follow-up 35,6 %. Significant difference in early and long-term efficacy was found between surgical techniques of MV and TV repair (X2 = 94,4, P=0.001). Moderate/severe mitral regurgitation was less common in the ring annuloplasty group (14,8 % and 23,4 % immediately and in 1-year after surgery correspondently, P<0.001). But even in these patients with mitral ring annuloplasty there is a significant difference in residual MR rate. Thus in 1year the rate of residual MR > = 2 gr. was 19,4 % in the rigid ring group and 33,3 % in semirigid ring group (hazard ratio 0,30; 95% confidence interval 0,13-0,68; X2 = 7,58, P=0.006).
CONCLUSIONS: In patients with ischemic functional mitral and tricuspid regurgitation the valve repair surgical techniques have an impact on early and long-term effectiveness. More stable results with less moderate/severe residual mitral regurgitation were received with new rigid annuloplasty ring using during primary surgery.

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Different right heart remodeling patterns in isolated tricuspid valvular surgery

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BACKGROUND: Chronic severe tricuspid valvular regurgitation results in progressive right ventricle dilatation and dysfunction, compromising the patients' life quality and long-term survival; while active surgical management could reverse or slow down the pathological processes. The aim of the present study was to investigate the effects of isolated tricuspid valvular surgery (ITVS) on right ventricular reverse remodeling in different etiologies of tricuspid regurgitation (TR).
METHODS: From January 2012 to December 2017, 82 patients receiving ITVS in our center were divided into group A (secondary TR, N.=34) and group B (primary TR or re-do tricuspid valve surgery, N.=48). The patients' files were retrospectively studied and followed up.
RESULTS: The mean follow-up time was 34 months. There was no significant difference in some parameters such as demographic information and comorbidities, as well as some parameters regarding surgical approaches (median sternotomy or right anterior thoracotomy), the duration of cardiopulmonary bypass, the incidence of re-entry, the implantation of intra-aortic balloon counter pulsation, and hemofiltration. However, significant statistical difference was observed between 2 groups in patients' ages 52.2±8.7 *vs.* 40.6±15.3 (P<0.01), NYHA classification (P=0.04), left atrial diameters (57.0±13.4mm *vs.* 37.0±10.7 (P<0.01) LVEF 59.7%±7.5% *vs.* 64.0%±8.3%)P=0.03) Euroscore II scoring (3.0%±0.6% *vs.* 2.3%±0.8% (P=0.03), type of surgery tricuspid repair or replacement (P=0.01) implanted materials ring/prothesis/band (P=0.04) off-pump surgery rates 79.4% *vs.* 56.3% (P=0.03) aortic cross clamping time 18.7±9.3min *vs.* 28.0±23.0min (P=0.04) post-operative mechanical ventilation time 61.2±52.2h *vs.* 27.6±17.5h (P<0.01) red blood transfusion 10.0±7.2u *vs.* 5.1±4.6u (P<0.01) duration of ICU stay 7.7±10.1d *vs.* 3.4±1.5d (P<0.01) post-operative hospital stay 22.6±16.6d *vs.* 15.3±6.1d (P<0.01). In follow-up, patients in group A presented with a trend of more pronounced reverse remodeling of right atrium -19.2±17.2mm *vs.* -14.8±15.2mm (P=0.12) and right ventricle -11.0±12.3mm *vs.* -6.8±13.2mm (P=0.09). Even though, the post-operative 30-day mortality8.8% *vs.* 0% (P=0.13) was not statistically different.
CONCLUSIONS: Secondary tricuspid valve regurgitation, compared to primary one, was associated with worse pre-operative functional status, higher surgical risks, longer recovery time following isolated tricuspid valve surgery, but the extent of reverse remodeling seems to be more profound.

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Comparision of myocardial protection for del nido cardioplegia undergoing minimal invasive mitral valve replacement surgery

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BACKGROUND: St.Thomas cold blood cardioplegia (ST) is most commonly used cardioplegia which requires repeated administration at interval of 18 to 23 minutes and is a hyperkalemic solution . This compared to del Nido cardioplegia (DN), which is administered at 60 -90 minutes leading to less frequent dosing & volume, and has a different chemical composition. In our study we aim to compare effectiveness of del Nido cardioplegia solution versus St.Thomas cold blood cardioplegia for myocardial protection in adult patients undergoing minimal invasive single mitral valve replacement surgery .
METHODS: A Single centre, prospective, randomised, case control study was done in department of Cardiovascular and thoracic surgery, King George's Medical University, Lucknow,India. 60 adult patients with rheumatic valvular disease were divided in 2 groups , group 1 recieved DN cardioplegia and group 2 SN cardioplegia . We analysed the total cardiopulmonary bypass time (CPB), aortic cross clamp time(ACC), volume and number of cardioplegia used, time to wean off CPB , intra-op defibrillation requirement & post-operative myocardial biochemical markers CPK-MB, Trop T, NT-Pro BNP .
RESULTS: Del Nido group was associated with significantly (P<0.05) shorter CPB time(121.34+-17.86 v/s 159.3+-24.37) and ACC time (84.2+-20.8 v/s 122.8+-24.76) . Lesser cardioplegia volume and fewer number was required with del Nido group (1368.4 +-70 v/s 2765.6+-56.3 ml and 1.4+-0.6 v/s 3.9+-1.5) respectively. Defibrillation requirement was less in del Nido group (0.4 v/s 1.9) and time to wean off CPB was comparable(24.45+-4.32 v/s 25.26+-3.34 min) . Post operative rise in NT-Pro Bnp and was sigmificantly more in St.Thomas cardioplegia group.
CONCLUSIONS: Del Nido cardioplegia provides with equal or better myocardial protection than St.Thomas cardioplegia solution and requires lesser dosing of cardioplegia volume.

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Vascular complications after TAVI in the era of miniaturized systems

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BACKGROUND: Transfemoral access for TAVI is the default approach in most experienced centres. Vascular complications (VCs) after TAVI have been described as an increased mortality risk. In recent studies VCs incidence is about 20%, with 14% of minor vascular complications (VCs) and 6% of major VCs.
METHODS: We enrolled all patients who underwent TAVI procedure in 2017 at the CHRU of Tours and Rennes. Access related VCs were collected according to the Valve Academic Research Consortium criteria (VARC-2). Anatomical parameters of preoperative CT angiography were extracted from the vessel centerline via Endosize® software. Treatment of VCs was registered in medical, endovascular or surgical treatment.
RESULTS: 478 consecutive patients were prospectively included. In this cohort 124 patients had VCs (25,9%), 2,9% major VCs and 23% minor VCs. 69% of VCs were related to the main puncture site versus 31% to the secondary puncture. Treatment was managed medically in 60% of

VCs, by endovascular treatment in 10% and by open surgery in 30%. In multivariate analysis, predictors of major and minor vascular complications were sheath-to-iliofemoral artery ratio (OR 6,1 ; P=0.002), diabetes (OR 2 ; P=0.01), and moderate to severe iliofemoral calcifications (OR 1,8 ; P=0.04). Length of hospitalization was significantly longer in patients with major and minor VCs (P=0.02). Thirty-day mortality rates were respectively 28,5%, 0,9% and 1,4% for major, minor, and no VCs. Major VCs were significantly associated with 30-day mortality (HR 54,2 ; P=0.002) and 1-year mortality (HR 31,3 ; P=0.005) compared to patients with minor and no VCs.
CONCLUSIONS: Most VCs were minor and frequent, major VCs occurred in 2,9% of all TAVIs and were associated with poor survival. The secondary puncture point must be monitored. Early detection of VC is necessary to avoid a minor VC becoming major.

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LVAD implantation in aneurysmally changed heart ventricles

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BACKGROUND: Surgical treatment of three patients indicated for implantation of permanent mechanical circulatory support device and with the associated left ventricular aneurysms were presented.
METHODS: In order to evade the left ventricular rupture, adverse thromboembolic events and provide safe implantation of the inflow cannula, LVAD HM3 implantation together with the reconstruction of the left ventricular aneurysmal wall was performed in two patients. Regarding the third patient, LVAD implantation upon the reconstruction of left ventricular wall was abandoned.
RESULTS: The first patient had gigantic pseudoaneurysm which involved the majority of the whole cavity. When pseudoaneurysm was opened, our evaluation, given its size and tissue fragility, was that there was no safe location for placement of the inflow cannula. After the LV reconstruction, our decision was to abandon LVAD implantation, and the patient subsequently underwent heart transplantation. The second patient belonged to high-risk group suffering both from end stage heart failure and neurofibromatosis. Given a huge aneurysm impregnated with calcium deposits, it was unfeasible to implant cannula in the usual place, and therefore, aneurysmal neck plication was done instead, followed by the inflow cannula implantation in the lateral wall above the plication. The patient died after two months due to respiratory complications. The third patient underwent the implantation of the inflow cannula in the way that its cuff was sutured after the ventricle had been opened , and upon our evaluation of the wall thickness of the aneurysmally dilated LV. The third patient is on the transplant waiting list.
CONCLUSIONS: LVAD implantation is a therapeutic option only in elected patients with gigantic aneurysms of the left ventricle. The implantation is associated with the increased risk of immediate surgical complications.
KEY WORDS: LVAD, Heart Mate 3,ventricular aneurysm.

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Staged repair of chronic dissecting aneurysm using two elephant trunks with extending to loop graft

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BACKGROUND: The two staged procedure using elephant trunk (ET) is accepted in the patient of an extensive aortic aneurysm. For chronic aortic dissection, aortic rupture, entrapment or obstruction of ET may be lethal complications during the interval. The loop graft for intercostal perfusion is a good option for preventing spinal cord ischemia during a 2nd-stage operation. We modified ETs technique, where two ETs were placed in the descending aorta and the loop graft which was extended from the small sized ET.
CASE REPORT: A 33-year-old man was admitted with a chronic dissecting aneurysm (Crawford II), extended to both iliac arteries. He had undergone a Bentall procedure for Stanford A acute aortic dissection.
A first-stage operation was performed as similar as an arch replacement but ET was modified as followed; We resected the dissecting septum as small as possible. Two elephant trunks were inserted by using a side-branched graft: the main graft was inserted into the large false lumen and the side graft into the small true lumen. The proximal part of ET, sutured to the remaining descending aorta, was anastomosed to a quadrifurcated arch graft.
6 months later, the second stage operation was performed as similar as the usual thoracoabdominal replacement except manipulating ET. The two floating ETs was identified separately at true and false lumens after opening the proximal descending aorta under partial bypass (Fig. 1). The descending aorta was replaced from the large sized trunk to both iliac arteries and four visceral arteries were anastomosed separately. An additional small graft, anastomosed proximally to the small sized ET, was sutured to multiple lower intercostal arteries side by side with the aortic graft and anastomosed with the distal aortic graft (Fig. 2). The patient was in good condition without any complication two years later after the last procedure.

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Perspectives and limitations of isolated tevar for the ascending aorta as cases-based clinical practice

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BACKGROUND: Open surgery remains the gold standard of treatment for ascending aorta. Occasional reports about endovascular repair of the ascending aortic deseases are limited to high surgical risk patients with unique aortic pathologies. There's no consensus regarding indications, selection criteria and technique of TEVAR in ascending aorta. We describe our cases of isolated ascending aortic endovascular repair and discuss the perspectives and limitations of ascendic aortic endografting.
METHODS: Available literature allows to claim that the first case of acute ascending aortic syndrome treated endovascularily was reported back in 2000. Nowadays total of just 52 publications focused on isolated endovascular repair of the ascending aorta with less than 150 patiens worldwide are available. The most commonly treated aortic pathology is type A dissections (58%) followed by aortic pseudoaneurysms (27,5%), penetrating aortic ulcers (3,6%), intramural hematomas (2,9%) and ascending aortic aneurysms (2,9%).
RESULTS: Approaches to isolated endovascular ascending aortic repair are discussed on two patients with penetrating aortic ulcer and a local pre-type A dissection with an intimal flap in midascending aorta. Both patients rejected open surgery and were scheduled for endovascular therapy using off-the shelf surgeon-modified endografts. Both procedures were performed in general anesthesia in Hybrid-OP with cardiosurgical backup and patient being positioned and wraped for the open aortic surgery. Transesophageal echocardiography and fluoroscopy were used for measurments and navigation, rapid pacing – for precise deployment. Succesful implantation was followed by uncomplicated postoperative period with no signs of dissection or endoleak and planed stent-graft position as well as by uncomplicated maximum 3-years follow-up.

CONCLUSIONS: Based on our and available reported cases endovascular repair in the ascending aorta can be feaseble in selected patients, especailly not suitable for open intervention. Future research and improvements in endovascular appoaches, devices and techniques undoubtebly could enable reliable ascending aorta TEVAR with low mortality and morbidity.

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Elastin-based and collagen-based mechanical properties of aortic wall in patients with aortic aneurysm

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BACKGROUND: Despite many authors investigated mechanical characteristics of aortic wall in order to detect potential markers of early detection of aortic complications, so far only ultimate mechanical properties (at rupture), based on progressive recruitment and extension of collagen fibers (collagen-based properties) have been extensively tested. During aortic wall stretching tests, however, there is also an initial compliant zone,which reflects elastin expression (elastin based properties). The correlations between initial and mechanical properties of aortic wall are not been clearly elucidated and are the subject of present paper.
METHODS: Specimen from 71 patients, undergoing ascending aortic procedure were collected. Overall 354 satisfactory tests (233 from anterior wall, 121 from posterior wall) were obteined. Uniaxial tensil extension (using longitudinal or circumferential force) was applied until specimen rupture. 6 Different parameters were obtained for each sample tested.3 parameters were related to elastin-based properties: initial stress (IS); Initial stretch (Istr) and initial elastic modulus (IEM) and 3 parameters to the collagen based properties: Peak stress (PS), Peak strain (Pstr) and maximum elastic modulus (MEM). Initial and ultimate mechanical properties were then analyzed and correlated.
RESULTS: Overall, at failure, both Pstr and MEM (markers of extensibility and stiffness of aortic wall) were significantly impaired in posterior wall samples.Despite high samples variability in elastolysis process, overall correlation between initial/ultimate extensibility and strength was statistically significant. Furthermore initial/ultimate strength and extensibility under longitudinal force were significantly correlated both in anterior ($r = 0,4726$, $P=0.0063$; $r = 0,8495$, $P<0.0001$,for strength and extensibility respectively) and posterior ($r = 0,6501$ $P<0.0001$ and $r = 0,8581$, $P<0.0001$ for strength and extensibility respectively) aortic wall.
CONCLUSIONS: Elastin-based mechanical properties seem not significantly influenced by different elatolysis process and a strong significant correlation between the elastin-dominated and collagen-dominated strength and extensibility of aortic wall is always preserved.

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Effectiveness of prosthesis valve replacement in patients with aortic stenosis: a systematic review and meta-analysis

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BACKGROUND: Cardiothoracic surgeons are facing a big challenge regarding the decision of the best valve replacement type that can be used in patients with Aortic Stenosis. It's still under debate to assess the most effective valve especially with old patients while different studies are comparing valves . Our aim of this systematic review and Meta-analysis was to assess the efficacy and safety while comparing variable protheses after aortic valve replacement.
METHODS: We searched PubMed, MEDLINE in Process, Scopus and Web of Science (previously ISI) for relevant studies, published up to January 2018. We included randomized controlled trials (RCTs) that compared different types of prostheses valves. Data were pooled as odds ratios (OR) or mean differences (MD) with their 95% confidence intervals (CI) between compared groups in a random meta-analysis model. Subgroup and sensitivity analysis were conducted. We assessed heterogeneity by a Chi-square test and I^2 statistic
RESULTS: From a total of 2828 entries identified, 29 RCTs were appropriate for inclusion into the final analysis. Regarding efficacy outcomes, Fractional shortening was significantly higher in Toronto than Cryolife O'Brien (MD = 6.00 mmHg, 95% CI [0.37, 11.63]).The effect estimate showed that EOA at 1 year was significantly higher in Edwards Perimount Magna than MM (MD = 0.29, 95% CI [0.17, 0.41]), higher in Cryolife O'Brien than Toronto (MD = 0.51, 95% CI [0.31, 0.71]), and higher in ROSS than MIRA (MD = 0.69, 95% CI [0.40, 0.98]). Regarding safety outcomes, the pooled effect estimate showed no significant difference between any compared prostheses in terms of LVMI and ICU stay.
CONCLUSIONS: Our findings showed that Fractional shortening was significantly higher in Toronto than Cryolife O'Brien, EOA at 1 year was significantly higher in Edwards Perimount Magna than MM, higher in Cryolife O'Brien than Toronto, and higher in ROSS compared to MIRA.

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Minimally invasive avr via upper mini-sternotomy using conventional instruments and cpb circuits - Aasim's techniques

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BACKGROUND: Establishing safe Cardiac Surgical practices, and doing minimally invasive cardiac surgery in deprived parts of the world like Khyber Pakhtunkhwa province of Pakistan and the neighboring Afghanistan is not an easy task, especially at a very young age. I want to present the successful story of safely conducting minimal invasive Aortic Valve Replacement surgeries using conventional instruments and conventional CPB Cannulae & Circuits, in Amiri Medical Complex Afghanistan, and Medical Teaching Institute-Hayatabad Medical Complex (MTI-HMC) Peshawar, Pakistan.
METHODS: All the patients operated by Dr. Muhammad Aasim for minimally invasive AVR in Ameri Medical Complex, Afghanistan and Hayatabad Medical Complex Peshawar Pakistan, from July 2016 to end of January 2019 are included in this study. Upper mini-sternotomy approach was adopted, using conventional surgical instruments. Conventional Aortic Cannulae and conventional two stage Right Atrial Cannulae were used establishing Cardiopulmonary Bypass Circuits just like for conventional Aortic Valve Replacement. Data of the patients were recorded prospectively in the dedicated computer in MS-Excel format.
RESULTS: Total of more than 06 Patients were operated for minimally invasive AVR by Dr. Muhammad Aasim in the mentioned time period. All the Surgical Patients received quality surgical treatment as per standard protocols and have very good outcome, without any morbidity or mortality.

CONCLUSIONS: Minimally invasive Aortic valve Replacement Cardiac Surgery Services can be established safely, by young properly trained Cardiac Surgeons, even in the deprived parts of the world having very limited resources.

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Reconstruction of bicuspid pulmonary valve in tetralogy of fallot surgery

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BACKGROUND: The purpose of the present study was to evaluate the surgical outcomes of our modification for reconstructing pulmonary valve using bicuspid valve technique in patients with tetralogy of Fallot (ToF).
METHODS: Between October 2011 and July 2016, a total of 132 patients underwent total repair for ToF. The pulmonary valve reconstruction using bicuspid technique was used in 25 patients (group I), and a TAP only without valve reconstruction was used in 107 patients (group II). The 1 st cusp of was formed from residual native pulmonary cusps and the 2nd cusp was made of autologous untreated pericardial patch.
RESULTS: The median age of the patients was 12 years (range, 1–34 yr). Total perioperative mortality was 5.3%, one perioperative death occur in redo case and 6 due to low cardiac output. Patients in pulmonary valve reconstruction group although had longer bypass and operative times; however it was not statistically significant (P>0.01). The early and midterm results demonstrated significantly more moderate or severe pulmonary insufficiency in the group II (68%) compared to group I (15%) (P<0.001). Echocardiography of bicuspid valve function obtained at 8.5 +/- 10.8 months showed an average bicuspid valve gradient of 22.6 +/- 28.2 mm Hg.
CONCLUSIONS: Pulmonary valve reconstruction using autologous pericardium to create bicuspid valve can be used in the majority of patients with ToF. Bicuspid valve performed as well as native valves and prevents early severe PI which preserves of RV function and improves short and midterm clinical outcomes.

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Long-term outcomes of valve repair versus replacement in isolated and concomitant tricuspid surgery

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BACKGROUND: Surgery for tricuspid valve (TV) diseases is associated with poor prognosis, but there are few studies describing long-term outcomes by comparing TV repair and replacement in either isolated or concomitant TV surgery. The aim of this study is to evaluate the trend of utilization of TV surgery and compare short-term and long-term outcomes between TV repair and TV replacement.
METHODS: Between 2000 and 2013, adult patients who underwent TV repair or replacement were identified from Taiwan National Health Insurance Research Database. Outcomes of interest were all-cause mortality, composite outcome (re-do surgery, heart failure, pacemaker and major bleeding) and readmission due to any cause. Concomitant and isolated TV surgeries were analyzed separately. Inverse probability of treatment weight with stabilized weight was used to reduce confounding.
RESULTS: Over a 14-year period, a total of 2644 patients underwent TV surgery with a mean follow-up of 4.9 years. Of them, 12.6% and 87.4% underwent isolated and concomitant TV surgeries respectively. In-hospital mortality of isolated and concomitant TV surgery was 8.7% and 8.6% respectively. In-hospital mortality rate of TV repair in isolated TV surgery was significantly lower than replacement (5.8% *vs.* 13.8%; odds ratio 0.39; 95% confidence interval [CI] 0.18-0.85). Proportions of all-cause mortality were 41.7% and 36.8% in the isolated and concomitant groups respectively. The TV repair demonstrated lower risks of all-cause mortality, composite outcome and readmission in either isolated or concomitant TV surgeries compared to TV replacement. However, a trend was observed that TV repair in isolated TV surgery was associated with a lower risk of all-cause mortality, though not significant (hazard ratio 0.66; 95% CI 0.42-1.04; P=0.072).
CONCLUSIONS: Compared with TV replacement, TV repair is associated with superior short-term and long-term outcomes in either isolated or concomitant TV surgeries.

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Modified arch replacement and frozen elephant trunk for type A aortic dissection

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BACKGROUND: Arch replacement in acute type A aortic dissection still has high mortality and morbidity. Several innovate techniques are used to decrease the injury. We modified the common total arch replacement and frozen elephant trunk method and preserved the supra-arch vessels and received good results.
METHODS: From January 2017 to December 2018, 71 cases of acute type A aortic dissection (16.8%, 71/423) were received modified arch replacement and frozen elephant trunk method to repair the aortic dissection. Briefly, after transecting the aortic arch at the proximal site of innominate artery, the stent device is inserted into the descending aorta close to ostium of the left subclavian artery. Continuous suture is applied to fix the stent with the native arch vessel. And one straight artificial vessel is anastomosis with the native "island" aortic arch.
RESULTS: No death was during hospitalization. The average CPB time was 211.8 minutes, clamp time was 153 minutes, hypothemic circulation arrest time was 33 minutes. The average intubation time was 8 hours. 2 cases with major endoleak were found during the follow-up time.
CONCLUSIONS: Modified arch replacement and frozen elephant trunk method is suitable for aortic arch repair in type A aortic dissection. But the complication of endoleak is still controversy.

Thursday May 23, 2019
17:00 - 18:30

Vascular Young Surgeon Award Session

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Immediate post-operative outcomes in hemiarch versus total arch replacement in type A acute aortic dissection

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BACKGROUND: For decades, despite advancement in aortic surgery, type A acute aortic dissection (AAD) is still associated with high mortality

and morbidities. Total arch and hemiarch aortic replacement were commonly performed as the management of type A AAD. This study sought to compare post-operative mortality and morbidities between the 2 procedures.
METHODS: In our centre, 37 patients had AAD from January 2017 to December 2017. Of the 29 patients elected for this study, 21 had hemiarch replacement while 8 had total arch replacement. Post-operative mortality and morbidities were assessed.
RESULTS:Mean age in hemiarch group was 46.95 ±12.10, in total arch group was 44.75 ±15.71 (P=0.70), there was also no significant difference in other pre-operative characteristics and comorbidities (P>0.05). Patients who had total arch had significantly higher mortality rate 50% *vs.* 16.67% (P=0.04) and also found to have significantly higher incidence of post-operative complications 75% *vs.* 33.33% (P=0.04) compared to hemiarch group. Cerebrovascular accident was the most common post-operative complication in total arch *vs.* hemiarch (37.5% *vs.* 28.6%) (P=0.64). Length of ICU and hospital stay in both groups were not differ significantly (P>0.05).
CONCLUSIONS: Surgical mortality rates was still considered high in type A AAD. This study showed that total arch replacement was associated with significantly higher mortality and morbidities compared to hemiarch replacement. Hemiarch replacement could be more safely performed in management of type A AAD compared to total arch.

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Carbon-dioxde flushing versus saline flushing of thoracic aortic stents to reduce vascular brain infarcts

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BACKGROUND: Vascular brain infarcts (VBI) formerly known as 'silent' cerebral infarction (SCI) detected on neuroimaging, can occur in 70% of patients and up to 13% of patients have clinical stroke. Inadequately de-aired delivery devices from standard saline flushing may contribute to cerebral embolization during TEVAR. Carbon-Dioxide (CO2) is a heavier gas to air and has been shown to effectively displace air from the surgical field in patients undergoing heart surgery. We present an observational study comparing the rate and quantity of VBI in patients undergoing TEVAR with standard saline flushing and CO2
METHODS: A prospective observational study was conducted between 2015 and 2018 at two tertiary vascular units in London, UK comparing the rate of VBI in patients undergoing TEVAR with standard saline versus CO2 flushing. All patients suitable for TEVAR with no adjunctive revascularisation procedures for all aortic pathology where eligible. In the first half of the study period consecutive patients underwent TEVAR with standard saline flushing according to IFU (TEVAR-S group). In the second half of the study period consecutive patients underwent TEVAR with 100% CO2 flushing at 2.8bar for 1-minute (TEVAR-CO2 group). TEVAR-S patients were randomly selected and compared to the TEVAR-CO2 group.
RESULTS: Pre and post-operative diffusion-weighted MRI was performed in 57 patients undergoing TEVAR. Total VBI rate was 61% (35/57). In 25 TEVAR-S patients the VBI rate was 56% (14/25) versus 25% (4/16) in 16 TEVAR-CO2 patients. Median number of lesions in TEVAR-S group was 1 (range 0-5) versus 0 (range 0-3) in TEVAR-CO2 (P=0.044).
CONCLUSIONS: CO2 flushing of TEVAR stent-grafts results in fewer VBI and significant reduction in the number of VBI following TEVAR. A multi-centre randomised controlled trial is underway to validate these findings and significance on neurocognitive dysfunction.

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The Fenestrated Anaconda™ for treatment of complex aortic abdominal aneurysms: an international, multicenter analysis

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BACKGROUND: This study was done to describe surgical applicability and clinical outcome of the Fenestrated Anaconda™ endograft globally.
CASE REPORT: All centers globally where over 15 patients with a complex abdominal aortic aneurysm (AAA) were treated with the Fenestrated Anaconda™ endograft were approached. Main outcome was procedural technical success, post-operative and follow-up clinical outcome for endoleaks, target vessel patency, reintervention rate and survival.
Eleven sites participated, resulting in 335 cases with a mean age of 73.6±4.6 years (292 male). A total of 920 fenestrations were included (mean 2.7±0.8 per case). Assisted primary technical success was 89.3%. In 6.9% of cases a procedural type Ia endoleak was observed, spontaneously disappearing in 82.6% of the cases during follow-up. Median follow-up was 1.2 years (IQR0.4–2.6). Renal function declined from 67.6±19.3mL/min/1.73m2 pre-operatively to 65.2±22.0mL/min/1.73m2 post-operatively and to 59.3±22.7mL/min/1.73m2 at last follow-up. In 140 cases 154 endoleaks were observed, including the procedural endoleaks. In 62.3% of the cases these endoleaks disappeared spontaneously. In 25 cases a reintervention for an endoleak was done. A total of 37 adverse events occurred for target vessels. The estimated cumulative target vessel patency at one and three years were 96.4±0.7% and 92.7±1.4%, respectively. A total of 75 reinterventions were done in 64 cases. The estimated cumulative reintervention-free survival at one and three year were 83.6±2.2% and 71.0±3.7%, respectively. Within 30 days post-operatively 14 patients (4.2%) died. Two deaths during follow-up were considered aneurysm related and one case was considered endograft related. The estimated cumulative survival at one and three years were 89.8±1.8% and 79.2±3.0%, respectively.
The custom-made Fenestrated Anaconda™ endograft is a valuable option for the treatment of a complex AAA. The relatively frequently seen procedural type Ia endoleak spontaneously resolves in most cases.

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Treatment options of spontaneous dissection of visceral arteries

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BACKGROUND: The wide application of computer tomography angiography (CTA) in diagnostic evaluation identifies an increasing number of spontaneous dissections of the visceral arteries (SDVA). SDVA can be treated either conservatively or invasively. The aim of the study was to analyze our results in the management of SDVA.
METHODS: This is a two-center retrospective analysis of patients who presented with SDVA from 2013-2018. All patients were assessed with computed tomography angiography (CTA) at presentation and during

follow-up. Patients received conservative treatment with or without endovascular intervention.
RESULTS: Twelve patients (1 female) presented with SDVA; 9 symptomatic (acute onset of epigastric or/and periumbilical abdominal pain) and 3 asymptomatic. CTA revealed a dissection of the celiac trunk (2 symptomatic) or the superior mesenteric artery (10 patients; 7 symptomatic). Symptomatic patients were initially treated conservatively with food and drink restriction and anticoagulant therapy with unfractionated or low molecular weight heparin. One patient with SMA dissection, who clinically deteriorated, was treated using a covered stent, presenting an immediate recovery. Another patient who suffered gastrointestinal bleeding due to mild ischemic colitis was managed conservatively with a complete recovery as well. The rest of the symptomatic patients were discharged several days after admission, showing clinical improvement. A short-term anticoagulant therapy was prescribed (1 month) with a long-term single antiplatelet therapy thereafter. Asymptomatic patients initiated single antiplatelet therapy and remained under close surveillance. During follow-up (range 3-60 months), all patients were asymptomatic and serial imaging confirmed the stabilization or improvement of the dissection.
CONCLUSIONS: The SDVA should be considered in differential diagnosis of acute abdominal pain. CTA is the preferred method for diagnosis and follow-up of these cases. Conservative treatment seems to be a safe and efficient option, while an endovascular procedure could be attempted in persistent symptomatology.

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The VENT technique using ovation stent-graft for juxtarenal aneurysms

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BACKGROUND: To report the first experience using the VENT technique in combination with the Ovation stent-graft to seal juxta-renal abdominal aortic aneurysms in patients with small iliac access vessels.
METHODS: Among 422 EVAR cases performed at our institution between July 2012 and November 2016, 12 patients (6 men and 6 female; mean age 78.7 years) underwent implantation of the Ovation stent-graft with a modified technique with synchronous placement of renal bare metal stent.
The VENT technique consisted in the deployment of the sealing ring of the Ovation stent-graft is at between 1 and 3 mm below the lowermost renal artery (rather than 13 mm) with the proximal edge of the fabric lying above the orifice of the renal artery. Short bare metal stent deployed simultaneously in the renal orifice and protruding few millimeters into the aorta allows renal patency preservation by moving the proximal edge of the fabric.
All patients presented with juxtarenal aortic aneurysms with necks <5 mm = “‘ and = “‘ iliac = “‘ vessels = “‘ 7 = “‘ mm = “‘ meaN.=“‘ 5 = “‘ 8 = “‘ mm = “‘ exclusioN.=“‘ criteria = “‘ was = “‘ a = “‘ diameter = “‘>31 mm at level of lowest renal artery. VENT stents were implanted into 9 left and 7 right renal arteries.
RESULTS: The immediate technical success was 100% without endoleak or other post-interventional complications. At a mean follow-up of 9.8 months (range 2-15) all renal arteries were patent and no gutters were noted. Ten patients presented shrinkage of aneurysm diameter > 5 mm and 2 patients had stable aneurysm dimension.
During follow-up, no patient required hemodialysis, no re-interventions were necessary and no aneurysm-related deaths were noted.
CONCLUSIONS: This early experience demonstrates that the use of VENT renal stent in combination with the polymer rings sealing technology from Ovation stent-graft is feasible and safe in treating juxtarenal aneurysm. Long-term results in larger patient cohorts are needed evaluate the utility of this alternative endovascular technique.

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Open Surgical Conversion (O.S.C.) after Endovascular Aortic Repair (E.V.A.R.): a six-year report

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BACKGROUND: The purpose of this report is to show the short and middle-term results of the open surgical conversion (OSC) after failed endovascular aortic repair (EVAR) in patients previously treated with the last generation endoprosthesis.
METHODS: Between 2013 and 2019, twenty patients underwent OSC at our Unit after at least one endovascular treatment for abdominal aortic aneurysm. The patients were treated electively or in emergency and the complications that led to conversion were classified in endoleak (group A) and non-endoleak related (group B).
RESULTS: The mean age was 78.5 years old and three patients were women. Fourteen patients had indication for elective OSC due to the presence of grafts thrombosis (28.6%) and endoleak with progressive aneurysmal sac enlargement (71,4%); the most common type of endoleak was the type I. Six patients were instead treated in emergency because of the rupture or the impending rupture of the aneurysm, related to the endoleak or to the graft infection in just one patient. We performed nineteen bypass-grafts (aorto-aortic and aorto-bisiliac) and an aneurysmal sac deafferentation plus peri-graft space injection of thrombin. The grafts were explanted completely in only four cases.
The 30-days mortality were respectively 15% for group A (all treated in emergency) and 0% for group B. At 1-year follow-up we did not register any further loss.
In one patient we had to perform a graft relining with an EVAR one year after the explantation.
CONCLUSIONS: The OSC after an EVAR has a high peri-operative mortality. Even if new grafts are less likely to fail and the instructions for use are followed meticulously, our most frequent indication for conversion is the presence of a type I endoleak and this should be taken into account during the preoperative planning and the post-implantation follow-up.

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Good survival and ambulatory state after ruptured aneurysm repair in octogenarians

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BACKGROUND: Octogenarians increasingly present themselves with a ruptured aneurysm of the abdominal aorta (rAAA). However, little is known about the postoperative outcomes and ambulatory state after rAAA repair in octogenarians. In order to make an informed shared decision, it is important that information is available about the expected postoperative outcomes.

METHODS: A retrospective study is performed in a peripheral an academic hospital in the Netherlands. Patients with an age above 80, operated for a rAAA between January 2013 and October 2018, are included. The primary outcomes are postoperative ambulatory state, 1-year mortality, and comparison in outcome after EVAR or OR.
RESULTS: 53 patients are included with a mean age of 84. The 1-year mortality is 48,9%, without a significant difference between endovascular aneurysm repair (47,4%) and open aneurysm repair (50,0%). 62% of the patients who survived the operation and admission were discharged home and 38% went to a nursing home for rehabilitation. After rehabilitation, 88% of the patients go back to living in their home situation.
CONCLUSIONS: Overall treatment outcomes are positive for octogenarians suffering from rAAA. More than half of the octogenarians that undergo treatment are still alive 1 year after rAAA repair. In addition, the vast majority of the operated octogenarians living in their own home after one year.

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The INDigo system in Acute lower limb malperfusioN (INDIAN registry): preliminary analysis of acute outcomes

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BACKGROUND: For many years surgical thrombo-embolectomy has been the mainstay of treatment of acute lower limb ischemia (ALLI). Recently, endovascular vacuum-assisted thrombectomy devices, similar to those utilized in the management of acute ischemic stroke, have been available for the treatment of ALLI, but data on this particular clinical setting is still scarce. The INDIAN-registry (Clinicaltrials.gov Identifier:NCT03386370) was a prospective, multicenter registry designed to investigate in a controlled setting the safety and initial efficacy of the Penumbra/Indigo-system in the treatment of peripheral arterial thromboembolism.
METHODS: A total of 124 patients were enrolled (male 74.2%, age 71.8±12.5) in 19 centers. ALLI occurred in native arteries in 94 cases (76%). Assessment of vessel patency is indicated using the Thrombolysis in Myocardial Infarction (TIMI) score classifications both before and after use of the device.The primary outcome is the technical success of the thromboaspiration with the Indigo system. Safety rate at discharge was defined as absence of any serious adverse events (SAE).
RESULTS: Technical success after thrombo-aspiration procedure (defined as complete or near-complete revascularization – TIMI 2/3 flow) and before any additional procedures was achieved in 114 patients (92%). After adjunctive endovascular or surgical maneuvers (angioplasty, stenting, lysis or embolectomy) technical success (TIMI 2/3) was achieved in 96.8% of patients (120/124). At discharge clinical success (defined as absence of death and limb loss) was 100%. No major adverse events were reported.
CONCLUSIONS: Our preliminary results revealed that mechanical thrombectomy with the use of Indigo system was safe and effective for revascularization of ALLI as a primary therapy or as a secondary therapy after other surgical or endovascular techniques had failed. After completion of the present study, the value of this system in the treatment of ALLI will be better defined, leading to a possible shift of treatment recommendation in the near future.

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The application of microbubbles and ultrasound-accelerated thrombolysis (must) for peripheral arterial occlusions

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BACKGROUND: Acute peripheral arterial occlusions can be treated by catheter-directed thrombolysis (CDT) as an less invasive alternative to surgical thromboembolectomy. Small gas-filled particles (microbubbles) have the possibility to enhance thrombolysis. Microbubbles can oscillate or collapse under the influence of ultrasound, resulting in mechanical forces on the clot surface making the thrombus more susceptible to thrombolytics. In this study, we used microbubbles in combination with ultrasound to accelerate thrombolytic therapy in patients with acute peripheral arterial occlusions.
METHODS: The MUST-trial is a phase-II-trial, focusing on patients with acute peripheral arterial occlusions. In this study, 20 patients will receive standard CDT (N.=10 with Urokinase, N.=10 with Alteplase), with addition of intravenous infusion of microbubbles and local transdermal ultrasound during the first hour of treatment. Primary endpoints are occurrence of serious adverse events: mortality and cerebral vascular bleeding. Secondary endpoints are angiographic success, clinical success, additional interventions, 30-day mortality, conversion, thrombolysis duration and additional study measurements. Outpatient follow-up will take place after 3 months, 6 months and 1 year including diagnostic tests.
RESULTS: Currently (10-02-2019), 12 patients are included (N.=10 Urokinase; N.=2 Alteplase). No mortality or serious adverse events related to the experimental treatment can be reported. Total thrombolytic therapy duration was median 74,0 hours (range 48,0-99,5), whereas flow was observed at duplex examination after median 24,0 hours (range 6,3-46,5). Revascularisation at angiography was established within median 51,0 hours (range 6,0-81,0). One patient received additional surgical thrombo-embolectomy due to an inflow problem in an occluded iliacocrural prothetic bypass. Six percutaneous transluminal angioplasties and one thrombosuction occurred during treatment and follow-up.
CONCLUSIONS: Preliminary results show promising outcomes without any major complication occurrence. We report no treatment-related serious adverse events and no mortality. Further inclusions are necessary to evaluate the safety and feasibility of contrast-enhanced sonothrombolysis during CDT in patients with acute peripheral arterial occlusions.

Thursday May 23, 2019
17:00 - 18:30

Best Vascular Poster Session

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Surgical tactics at patients with Takayasu disease of extracranial vessels

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BACKGROUND: Analyze the surgical treatment of patients with Takayasu Disease (TAK) of extracranial vessels.

METHODS: Retrospective analysis of the surgical treatment of 66 patients with TAK was conducted. From them women - 50 (75.8%) patients. Patients were divided into 3 groups.

— Group 1 - open interventions - 28 cases: resection of the aneurysm of the ICA with alloprosthetics - 2; bifurcation aorto-carotid bypass - 6; prosthetics of the common carotid artery (CCA)- 12; subclavian-carotid bypass - 8 patients.

— Group 2 - endovascular interventions - 20 patients: vertebral artery (VA) angioplasty - 6, VA angioplasty and stenting - 2; CCA angioplasty - 4; angioplasty of the subclavian artery (SA) and brachiocephalic trunk - 2; angioplasty and stenting of common carotid artery (CCA) - 6 cases.

— Group 3 - hybrid interventions - 18 patients: CCA stenting + endarterectomy (EAE) from CCA and internal carotid artery (ICA) with allopatch - 8; CCA prosthetics + SA angioplasty - 4; CCA prosthesis + angioplasty and SA stenting - 4; angioplasty and stenting of CCA + angioplasty SA and VA+ EAE from CCA and ICA with allopatch- 2 patients.

RESULTS: In postoperative period hyperperfusion syndrome — 1 — was observed in group 1, and ICA thrombosis with ischemic stroke — 1 case. In the follow-up period from 6 months to 5 years, ischemic stroke was in 2 patients from group 2.

CONCLUSIONS: Shunting and prosthetics is the method of choice in patients with TAK with an extended occlusive lesion of the arteries, but it has a higher tendency to develop postoperative complications. Endovascular treatment is advisable to perform at patients with local lesions and high anesthetic risk. Hybrid operations can increase the effectiveness of surgical treatment of patients.

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The estimated initial Warfarin dose calculated by pharmacogenetic-guided algorithms was lower than actual initial dose

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BACKGROUND: It is recommended that initial warfarin dose determined from pharmacogenetic-guided algorithms, because warfarin has very narrow therapeutic range. The mostly commonly used algorism is the one from 'WarfarinDosing.org' which is supported by the Barnes-Jewish Hospital. The warfarin dose estimates are based on clinical factors such as age, ethnicity, race, weight, height, smoking, liver disease, indication for warfarin, baseline INR, target INR, medications which effect on cytochrome function, and genotypes of two genes: cytochrome P450 2C9 (CYP2C9) and vitamin K epoxide reductase (VKORC1). We compared the actual initial dose and estimated dose determined from pharmacogenetic-guided algorithms.

METHODS: 35 Korean patients who underwent valve replacement surgery from 2003 to 2015 in our hospital were enrolled this study. We analyzed the CYP2C9*2 (rs1799853), CYP2C9*3 (rs1057910), and VKORC1 (rs9923231). We defined underestimated dose (patients whose estimated dose was > 20% below the actual dose), ideal dose (patients whose estimates dose was within 20% of the actual dose), and overestimated dose (patients whose estimated dose was >20% above the actual dose).

RESULTS: The weight and height was 63.77±10.89 kg and 164.31±10.75, respectively. All patients had wild type of CYP2C9*2. There was 1 of heterozygote (AC) of CYP2C9*3, and 34 of wild type (AA) of CYP2C9*3. There were 31 of AA type of VKORC1 which is known as warfarin sensitive type, and 4 of AG type which showed normal warfarin metabolism. The initial INR level before warfarin start were 1.21±0.13. The actual initial dose range was 3-6 mg, however the estimated dose rage was 2-4 mg. 32 patient got overestimated dose, and only 3 patient got ideal dose.

CONCLUSIONS: There was tendency that the actual initial warfarin dose was higher than estimated dose determined from pharmacogenetic-guided algorithms.

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Interim results of thoracic endo-vascular aortic repair in trauma patients

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BACKGROUND: Thoracic Endo-Vascular Aortic Repair (TEVAR) is widely used in thoracic aortic pathologies. We evaluated the early and mid-term outcomes of TEVAR in traumatic thoracic aortic injuries.

METHODS: TEVAR was performed in 10 patients with traumatic thoracic aortic injuries between July, 2009 and September, 2015. The follow-up was complete, and the mean duration of follow-up 65.9 months. The mean age was 53.2, and male patients were 9/10 (90%). The causes of trauma were fall-down injuries in 6, traffic accidents in 3, and iatrogenic injury in 1 patient. The iatrogenic thoracic aortic injury occurred after posterior fixation with instrumentation of thoracic and cervical spines. The thoracic aortic pathologies were aortic rupture in 6, dissection of descending thoracic aorta in 2, and intramural hematoma in 2. The location of aortic injuries were aortic isthmus in 7 and the levels between 7th and 10th thoracic spines in 3 cases.

RESULTS: Two hospital mortalities occurred due to CNS injuries and acute respiratory distress syndrome followed by lung contusion. Two patients suffered serious spinal cord injuries after fall-down injuries but survived. All deaths or complications were not related with TEVAR procedures. There was no late mortalities. The follow-up CT aortography revealed no leakage and the wide patency of the stent grafts.

CONCLUSIONS: TEVAR is a safe and effective modality in thoracic aortic injuries. Especially, it facilitated to save the traumatic patients in the emergent or urgent conditions.

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Midterm outcomes of endovascular aneurysm sealing: migration & sac expansion as modes of graft failure

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BACKGROUND: Endovascular aneurysm sealing (EVAS) was conceived as a new paradigm in the treatment of abdominal aortic aneurysm (AAA). Two aortic stentgrafts are surrounded by polymer-filled endobags, creating a sealing zone in the aortic neck and common iliac arteries, providing anatomical fixation within the aortic sac.

METHODS: Pre-, intra- and postoperative data were collected and analysed for all patients undergoing EVAS at a single institution for unruptured, infrarenal AAA, between March 2013 and December 2017.

RESULTS:185 cases are reported, the patients having a mean age of 75.2 years. The average aortic diameter was 64 mm. 49.2% of cases

adhered to the original instructions for use (IFU) and 18.4% adhered to the revised IFU of 2016. Median follow-up was 2.67 years. Freedom from reintervention was 80.5% and 52.3% at 2.67 and 5 years. Freedom from all-cause mortality (ACM) and aneurysm-related mortality (ARM) was 79.2% and 58.1%, and 95.6% and 87.0% at 2.67 and 5 years. A composite measure of graft failure, comprising secondary sac rupture, graft migration or sac expansion greater than 5 mm, type 1a or 1b endoleak, occurred in 73/185 cases (39.5%), at a rate of 14.83 per 100 patient-years. Freedom from graft failure at 2.67 and 5 years was 77.77% and 30.64% respectively. Eleven secondary ruptures occurred (5.9%) at a rate of 2.44 per 100 patient-years. Compliance with the revised IFU did not reduce postoperative complication or graft failure rates. Compliance with the original IFU significantly reduced the rates of type 1a endoleak (P=0.010), ACM (P=0.007) and ARM (P=0.006).
CONCLUSIONS: Midterm results have not borne out the optimism surrounding the early results. Graft failure has been seen in approximately one third of cases, most commonly due to stentgraft migration with type 1a endoleak and sac expansion.

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Post coarctation aneurysms of aorta: frequency, methods and result of treatment

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BACKGROUND: Coarctation of aorta (CoA) accounts for approximately 7% of congenital heart lesions. The most widespread method of correcting of CoA is surgery. In remote period there is a high risk of aneurysm formation.
METHODS: 4245 patients with CoA were operated in the Institute during 1960-2017. At the beginning of 2019 (1.01.2019) 189 (4.5%) patients had aneurysms after CoA repair during the period from 1 months to 42 years. When the first operation was performed patients' age ranged from 1 to 38 yy, on average – 17,8 yy; the second one – 9-72 yy, on average – 42,8 yy. Mean time from CoA repair to postcoarctation aneurysm correction composed 25,4 years.
Aneurysms developed in 17 (0.6%) pts after CoA repair via end-to-end anastomosis, in 18 (5.9%) patients after aorta grafting and in 136 (11.2%) after patch aortoplasty. Aneurysm diagnosis was established by X-ray, TT/TEEcho and CT.
155 (82.0%) patients were operated, among them 14 pts were operated two times and 4 pts – three times, 34 (18.0%) of them abstained from surgery for various reasons (26 patients died during 5 years after conformation of diagnosis). Visceral organs protection during redo surgery was performed by passive shunt between ascending and descending aorta in 126 (81.3%) cases, left atrium-descending aortic bypass was used in 11 (7.1%) cases, "clamp and sew" technique – 2 cases. The frequency of methods used for correction after aneurysms resection was next: graft replacement – 136 pts (87.7%), aortorrhaphy - 3 pts (1.9%), TEVAR – 16 (10.3%) pts.
RESULTS: Hospital mortality composed 9.0% (14pts). There were no renal and spinal cord complications.
CONCLUSIONS: 1. The highest rate of complications in remote period showed the method of patch plasty (11,2%). 2. Grafting of aorta (open surgery or TEVAR) at the site of CoA correction is a life-saving procedure.

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Acute venous thrombosis of right lower extremity

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BACKGROUND: Venous thrombosis are important factor affecting morbidity and mortality.
We presented a patient having acute venous thrombosis of right lower extremity that underwent ballon angioplasty due to superficial femoral artery stenosis.
METHODS: A 62-year-old man admitted to the outpatient clinic of our hospital in June, 2018. He had pain and edema in the right lower extremity.
RESULTS:Venous Doppler ultrasonography detected thrombosis in the deep venous system of the right lower extremity. He underwent ballon angioplasty due to superficial femoral artery stenosis. Anticoagulant therapy with low-molecular –weight heparin (LMWH) was immediately started. The patient's symptoms, particularly pain and edema continued to improve in the right lower extremity.
CONCLUSIONS: Low-molecular –weight heparin is important in treatment of acute deep venous thrombosis of the lower extremity in patients undergoing ballon anjioplasty due to superficial femoral artery stenosis.

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Gender impact on survival after major lower limb amputation

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BACKGROUND: Despite a huge progress in endovascular technology and improved results in open vascular surgery, major lower limb amputations due to peripheral artery disease are still very common procedures.
In our everyday clinical practice, we see a difference between survival rates of men and women after lower limb amputations.
METHODS: A retrospective cohort study was run in order to check how gender and other risk factors affect survival rates after lower limb amputations. All patients who underwent major lower limb amputation in Vilnius in 2005-2010 were enrolled. Patient data was gathered from medical record files, death date was accessed from National Registry. The outcome of the study was all cause mortality.
RESULTS: There were 1402 lower limb amputations performed, 1350 of them (96.3%) were included in analysis. The mean age was 71.99±9.53. The proportion of males was 64.0% (864 patients).
The overall median survival after amputation was 596±47 days.
We have observed a statistically significant difference in Kaplan Meyer survival curves for men and women. One year after the amputation 65% of men (558 out of 864) were outcome free whereas only 47% of women (227 out of 486) survived.
Cox proportional hazards model was created with statistically significant risk factors (female gender, previous cerebral ischemic events, more than one amputation on the same leg, patient age, diabetes mellitus, amputation above the knee *vs.* below). Female gender was proved to be an independent risk factor in our model for shorter survival.
CONCLUSIONS: The overall survival rate after major lower limb amputation is very short, one half of the patients dye during 20 consecutive months. Female gender is an independent risk factor. The biggest difference in survival rates between the genders was seen in the first two years after the procedure.

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Mycotic abdominal aortic and iliac aneurysm caused by streptococcus equi subspecies zooepidemicus bacteremia

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BACKGROUND: This report describes a case of a taxidermist that presented with sepsis and excruciating back pain a few weeks after contact with a deceased horse.
CASE REPORT: Streptococcus equi subspecies zooepidemicus (SESZ) was isolated from the patients' blood and two isolated mycotic aneurysms were found. The first was located in the distal abdominal aorta and the second in the right common iliac artery. Treatment consisted of penicillin administration for six weeks and surgical debridement of the infected tissue combined with autologous vein reconstruction. The patient was infection-free without complaints one year after discharge and the venous reconstruction was patent.
Reports in literature of bacteremia with SESZ leading to the development of mycotic aneurysms are very scarce, and show that prognosis is generally unfavorable.

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The impact of SUPRA or infrarenal fixation on renal function following EVAR

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BACKGROUND: Renal involvement in EVAR with supra versus infrarenal anchorage has been assessed in different studies, obtaining disparate results.
METHODS: Patients intervened by EVAR in our service during the year 2018. Retrospective cohort study collecting characteristics of morbidity, treatment, stay, aortic diameter, renal function (preoperative glomerular filtration and pre and postoperative creatinine), type of endoprosthesis and main complications. Patients with combined procedures with TEVAR or BEVAR, use of CO2 instead of iodinated contrast and those with prerenal renal failure during admission have been excluded.
RESULTS: 40 patients fulfilled the inclusion characteristics, adrenal fixation was 22 (55%) and infra in 18 (45%). The average age was 74.2 years (59-85), with 97.5% men. 67.5% of patients suffered from hypertension, 65% had dyslipidemia and 62.5% had smoking. The preoperative glomerular filtration rate was 69.18+/-15.2, with a mean preoperative creatinine of 1.09+/-0.35 and a postoperative peak creatinine of 1.38+/-0.98. The postoperative stay was 4.73+/-2.86 days. Comparing the infra with adrenal group, both were homogeneous in terms of age and other cardiovascular risk factors, as well as in concomitant medication with antiplatelet agents, anticoagulants, antihypertensive drugs and diuretics. There were no differences in preoperative glomerular filtration levels (71.83+/-14.20 *vs.* 67.00+/-16.35, P=0.334), preoperative creatinine (1.02+/-0.22 *vs.* 1.16+/-0.43, P=0.271) or postoperative peak creatinine (1.22+/-0.34 *vs.* 1.52+/-1.28, P=0.870). There were also no differences in postoperative stay (5.33+/-3.55 *vs.* 4.23+/-2.11, P=0.197).
CONCLUSIONS: No statistically significant difference was observed in postoperative renal function comparing EVAR with supra versus infrarenal fixation in our service during 2018. Further follow-up would be necessary to know the possible long-term influence.

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Changes in the surgical strategy for mycotic thoracic aortic aneurysms

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BACKGROUND: The commonly accepted to gold standard management strategy for mycotic thoracic aortic aneurysm (MTAA) remains to be open surgical resection with graft replacement. However, some patients with MTAA are considered unsuitable for radical surgery because of old age and the presence of severe and multiple comorbidities. In more recent years, we have successfully performed omental wrapping followed by thoracic endovascular aortic repair (TEVAR) for MTAA. In this report, we discuss about potential of TEVAR as definitive treatment for MTAA.
METHODS: Between January 2012 and December 2018, 571 patients including 313 cases of TEVAR were surgically treated for thoracic aortic aneurysms in our institution. Among them, 13 patients were surgically treated for MTAA. In these MTAA patients, TEVAR was performed on 11 high-risk patients (men, N.=7; mean age, 74.0 ± 10.6 years) located in the arch (N.=7), descending aorta (N.=3), and thoracoabdominal aorta (N.=1). Nine patients (81.8%) underwent emergency TEVAR for impending rupture or ruptured aneurysm.
RESULTS: Two patients died in the hospital (operative mortality, 18.2%). The other two patients required additional aortic fenestration with omentopexy due to residual infection after TEVAR. Four patients include two patients who received omental wrapping died of causes not related to the aneurysm during the follow-up period. One patient required computed tomography-guided drainage for mediastinitis due to esophageal perforation late after TEVAR. Survival rate at 3 and 5 years were 56.0 and 28.0%, respectively.
CONCLUSIONS: Although TEVAR has not been shown to have a beneficial long-term survival, postoperative infection can be well-controlled. TEVAR has the potential to be a definitive treatment modality in high-risk MTAA patients. Omental flap wrapping of implanted artificial aortic grafts during TEVAR, as well as open surgery, could prevent or reduce the occurrence of subsequent infection.

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Left subclavian artery re-routing for hybrid repair of acute non-A non-B aortic dissection

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BACKGROUND: Non-A non-B aortic dissection is a rare entity. The natural history and prognosis for patients with this type of dissection is still unknown. Therefore, the most appropriate treatment for this entity is unclear.
METHODS: A 62-year-old woman was admitted to our institution due to abrupt severe chest pain. After an acute coronary syndrome had been ruled out, computed tomographic angiography(CTA) revealed the arch is involved by retrograde propagation of a dissection that originates distal to the left subclavian artery.
RESULTS: Even though she was treated with a regimen of antihyper-

tensive medication and bed rest, her symptoms was progressive and the intramural hematoma of the arch aorta was increased after the follow-up CTA on next day. First, transposition of the left subcalvian artery to the left common carotid artery with proximal ligation of the left subcalvian artery was performed via a left supraclavicular incision. Simultaneously, we performed thoracic endovascular aortic repair with coverage of the intimal tear. At the last follow-up, she was doing well with no aortic or neurologic events.
CONCLUSIONS: Non-A non-B aortic dissections is little known in cardiothoracic and vascular community and there are no available guidelines for the management of this clinical entity. Therefore, the identification of this clinical entity is very important for comparing modalities of treatment for this disease. Despite our knowledge on the subject is very limited, we think that the early intervention is indicated in non-A non-B dissections.

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Ascending aortic aneurysm and coarctaction, mini bentall technique and TEVAR with GORE C TAG endograft

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BACKGROUND: Aortic coarctation (AC) and ascending aortic aneurysm (AsAA) represent a rare and difficult-to-manage combination. We ought to share the minimally invasive two-stage approach that we succesfully adopepted to treat this challenging condition .
METHODS: The patient was an asymptomatic 56 old male with a 57 mm ascending aorta, a moderate-to-severe aortic regurgitation and a severe AC with a minimun diameter of 4 mm and a mean trans-aortic gradient of 65 mm/Hg. Managed by our Aortic Team, we decided to perform a minimally invasive two step repair: aortic root replacement trhough a 5 cm incision followed by the AC endovascular treatment using a covered stent graft. In vitro stent-graft deplyoment simulations were performed to optimize the technical success of the procedure.
RESULTS: Root replacement with a valved conduit through a 5 cm ministernotmy approach was firstly performed. After 2 months we proceded with the AC endovascular treatment.Through a femoral access, a preliminary dilatation of the coarctacion with a 7mm non compliant baloon was performed; then, the a Gore C Tag 28 X 100mm was deployed followed by progressive angioplasty using 8, 10 and 14 mm baloons. The aortic gradient was reduced to zero. Boh procedures were uneventfull and post-op CT scan confirmed the good correction of both lesions.
CONCLUSIONS: AsAA and AC represent an infrequent challanging condition that can be treated with a minimally invasive approach by operators with good experience in minimally invasive surgery and endovascular techniques. The use of a covered and compliant stent for AC treatment is feasible and may reduce the risk of major complications.

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The reliability of peripheral arterial disease clinical findings in end-stage renal disease patients on hemodialysis

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BACKGROUND: Chronic kidney disease patients are at high risk for developing atherosclerotic cardiovascular disease including peripheral arterial disease (PAD). This study aims to examine the prevalence of PAD and clinical findings in hemodialysis (HD) patients with PAD.
METHODS: The cross-sectional study included 156 HD patients. We analyzed clinical findings and laboratory parameters as well as concomitant diseases in all participants. We performed physical examinations and ankle-brachial index (ABI) for all patients. As for the statistics, Hi square test and Spearman's correlation were used.
RESULTS: The PAD was found in 46 (29.5%) patients, out of which 37% were female. Compared to the HD patients without PAD, the HD patients with PAD were older (62 ± 11 *vs.* 67 ± 11 years). Hypertension was the most common disease in PAD patients that led to terminal uremia and hemodialysis in 50% of cases, followed by diabetes mellitus (DM) in 21.7%. DM was present in 39.1% of PAD patients (P=0.015). We registered intermittent claudication in 17 (37%) HD patients with PAD and the presence of femoral bruit in 52 (33%) patients in the right and at 60 (38,5%) patients in the left groin. In the same time pulsation on dorsalis pedis and tibialis posterior artery was absent in 48 (30.8%), and 60 (38.5%) on the right, and 53 (34%) and 63 (40,4%) on the left side respectively. In a multivariate analysis, C-reactive protein (CRP) OR (95% CI) 1.03 (1.00-1.05) P=0.022. and Hickman access for HD, OR (95% CI) 3.86 (1.00-14.00) P=0.049, were independent predictors for PAD in HD patients.
CONCLUSIONS: PAD is highly prevalent in HD patients. Patients with intermittent claudications, higher CRP values and Hickman vascular access for HD have a higher probability of developing PAD. ABI <0.9 in correlation with claudications and clinical findings indicates clinically significant PAD.

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Hybrid image fusion, to fuse or not to fuse?

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BACKGROUND: The use of image fusion in the hybrid operation room enables the vascular interventionist to guide its multi-branched endovascular devices with a 3D roadmap based on preoperative CTA. We investigate the possible advantages of image fusion in the hybrid room for endovascular aortic repair (EVAR).
METHODS: A meta-analysis was performed with a search in accordance to the PRISMA guidelines. Data on contrast volume, fluoroscopy time, radiation dose, procedure time were investigated. This data was also collected based on a cohort of our own image fusion complex EVAR patients. Standard EVAR is also included and compared with a retrospective non-image fusion in-hospital cohort.
RESULTS: A total of 9 studies were included (N.=962). Image fusion reduced contrast volume with 63 mL compared to standard DSA (95% CI 74.14 to 265.86, P=.01) in standard EVAR with a mean of 79 mL (95% CI 17.75 to 140.44, P=<.00001) for complex EVAR. The fluoroscopy time in the hybrid fusion group was reduced with 14 minutes (95% CI 2.45 to 25.00, P=.04) in standard EVAR compared to a 15 minutes reduction (95% CI 6.51 to 35.56, P=.17) for complex EVAR. In our own hospital data, the standard EVAR procedure with image fusion (N.=10) contrast was 115 mL (85-160 mL) and fluoroscopy time was 28 minutes (21-36), which were not significant different than our historical cohort without im-

age fusion(N.=36). For complex EVAR repair with hybrid fusion (N.=7) the reduction of contrast volume or fluoroscopy time were not observed in our hospital compared to the data of the review.
CONCLUSIONS: In the systematic review, image fusion is associated with a significant reduction in contrast volume and fluoroscopy time. However, this advantage was not seen in our own patient data. The risk of bias such as radiation training during image fusion implementation and learning curve should be considered.

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The results of 'BASEX' prostheses in vascular surgery (results of 4825 operations)

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BACKGROUND: To demonstrate the antimicrobial, impermeable and thromboresistant properties of "BASEX" grafts in vascular surgeries.
METHODS: "BASEX" (Bokeria-Abdulgasanov-Spiridonov explants) grafts is being manufactured and used in our center since 1997. Domestic textiles were subjected to various modifications for manufacturing "BASEX" patches. Medical gelatin was used as a base for its coating. To maintain the antimicrobial and thromboresistant properties of the coatings were introduced, antimicrobials (ciprofloxacin, metronidazole), anticoagulants (heparin), antiaggregants (acetylsalicylic acid, dipyridamole).
RESULTS: During 1996-2019, "BASEX" grafts were used on 4825 patients for reconstruction of aorta and the arteries. During the observation period from 2 months till 17 years after the surgeries, early prosthetic thrombosis occurred in 2.7% patients and late in 5.4% patients. 91.9% patients retained good graft patency with no signs of inflammation. Surface suppuration of postoperative wound was observed in 5.9%, deep abscess in 2.1% patients. After rehabilitation, recovery and healing of wounds without graft infection were observed. Superficial wound infection was observed in only one patient during postoperative period. Infections within peri-prosthetic space were observed in 0.6% patients. All have recovered following conservative measures. The post-operative mortality rate was 2.7%, the causes of mortality in 72.4% patients were acute cardiac insufficiency, 2.0% acute pulmonary insufficiency, 11.2% acute renal failure, 2.0% peritonitis, 11.2% bleeding and 1.0% preoperative sepsis.
CONCLUSIONS: Thus, vascular grafts "BASEX" demonstrated antimicrobial, thromboresistant and impermeable properties preventing pyoseptic complications, significantly reducing the intra- and postoperative bleeding and can be widely used in vascular surgeries.

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Hybrid techniques in aortic arch surgery

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BACKGROUND: Conventional repair has been the "gold standard" procedure in aneurysmal dilatations, dissections and traumatic ruptures of the aortic arch for a long period of time and is a complex arterial repair associated with mortality rates ranging between 5-15%. The aortic arch poses great technical and technological difficulties because of the complex circulatory management and cerebral protection, the origin of the supra-aortic trunks, severe atherosclerosis and the proximity of aortic leaflets. The emergence of endovascular procedures changed the therapeutic management strategy towards a completely endovascular or a hybrid approach combining endovascular exclusion of the affected area and debranching of supra-aortic trunks.
METHODS: In the current paper, the authors present their experience with the preoperative evaluation, decision-making process, therapeutic and circulation management strategies in patients with aortic arch diseases depending on the involved zones, type of pathology and locoregional anatomy.
RESULTS: There are evaluated 4 representative cases, 1 patient with traumatic rupture of the aortic isthmus, 1 patient with aorto-esophageal fistula and 2 patients with aortic arch aneurysms managed by endovascular or hybrid repair at the Institute of Cardiovascular Diseases from Iasi, Romania. In the former two cases, endovascular treatment was combined with complete arch debranching (Dacron graft sutured onto the ascending aorta from which branches to supra-aortic trunks arise) and left common carotid artery-left subclavian artery transposition with good long-term results. The slightest aggressiveness of endovascular techniques allows the treatment of high-risk patients who are not considered suitable for the traditional open-heart operation.
CONCLUSIONS: Hybrid procedures represent a technical advancement in the field of aortic arch surgery suitable for high risk patients.A good collaboration between interventional cardiologists, cardiovascular surgeons, anesthesiologists and radiologists is essential to optimize the surgical choices.
KEYWORDS: hybrid surgery, aorta, aneurysm

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Femoral artery reconstruction using spiral vein interposition graft

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BACKGROUND: Reconstruction of damaged, infected left femoral artery with spiral vein interposition graft in a 27 year old chronic intravenous drug abuser with acute onset severe pain in left leg.
METHODS: Duplex doppler study revealed left common and superficial femoral artery (CFA & SFA) thrombosis with perivascular collection. Deep venous system was normal. On exploration, frank peri-arterial pus with macerated vessel wall of CFA & SFA. Thromboembolectomy was done. Femoral artery vessel wall was macerated and infected, with loss of segment of around 4 cm. Bilateral great saphenous veins(GSV) were found thrombotic. The right GSV harvested, longitudinally split and spiralled over 1⁄4 inch polyvinylchloride cardiotomy tubing piece. The edges of spiralled vein were sutured together in double layer with 6-0 polypropylene suture. The spiral vein graft interposed between CFA proximally and SFA distally.
RESULTS: Successful, hemostatic, limb revascularisation achieved with use of spiral vein interposition graft with good graft - native artery size match.
CONCLUSIONS: In difficult emergency situations with limited resources, spiral vein interposition graft can be used as good conduit for femoral artery reconstruction.

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Endograft conformatbility in fenestrated aortic endovascular aneurysm repair

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BACKGROUND: Endovascular aneurysm repair may change the native anatomy, with potential repercussions for graft-related com-

plications. In the current study we have compared the impact of two commercially available custom-made fenestrated endografts on the patients' anatomy.
CASE REPORT: From 2001 until 2016 all patients treated with a fenestrated endograft were screened for this retrospective multicentre cohort study in two hospitals. Inclusion criteria were availability of qualified pre- and post-operative computed tomography angiography (CTA) and treatment with an endograft solely containing fenestrations. Group 1 included patients treated with the Zenith™ Fenestrated endograft and group 2 included patients treated with the Fenestrated Anaconda™. Variables were infrarenal aortic angle, target vessel (TV) angle, the TV tortuosity index (TI). Variables were tested for observational agreement. Differences were analysed between groups for preoperative values and for difference in change.
234 patients were treated of which 151 met the inclusion criteria. Group 1 contained 116 patients and group 2 contained 35 patients. There was a good observational agreement and the TV TI showed a good reproducibility (P=0.000). When comparing the anatomic change, the aortic (P=0.004), SMA (P=0.022) and CA (P=0.012) angles, the aortic diameter at the SMA level (P=0.000), and the clock position of the renal arteries (left, P=0.000; right, P=0.000) changed significantly in group one only, the SMA TI (P=0.030) changed in group two only and the renal artery angels in both groups (group one *vs.* group two; left, P=0.000 *vs.* P=0.001; right, P=0.000 *vs.* P=0.000). There were no differences between groups in difference in change, except for the aortic diameter at the SMA level, that changed significantly in group one only (P=0.000).
This study implicates less influence on vascular anatomy of the Fenestrated Anaconda™ endograft compared to the Zenith® Fenestrated.

Friday May 24, 2019
08:00 - 9:30

Cardiac Abstracts Session 4: Tavi

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Redo surgery versus femoral transcatheter valve-in-valve implantation for degenerated aortic bioprosthesis

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BACKGROUND: Surgical reoperation is still a standard procedure in degenerated aortic bioprosthesis, although femoral transcatheter valve-in-valve implantation (TAVI-VIV) seems to be an interesting and less invasive alternative, especially for high risk patient. This investigation was aimed to evaluate the results of degenerated aortic bioprothesis reintervention after redo-surgery (Re-AVR) and femoral TAVI-VIV.
METHODS: We reviewed retrospectively 120 patients with degenerated aortic bioprosthesis qualified for Re-AVR (N.=52; 43.3%) or femoral TAVI-VIV (N.=68; 56.6%) between March 2003 and April 2018. All acute endocarditis, concomitant cardiac procedures, other approach than femoral for TAVI-VIV, previous mechanical or transcatheter valves were excluded.
RESULTS: Patients qualified for femoral TAVI-VIV were significantly older (72.1+7.4 *vs.* 79.1+5.7, P<0.001) and presented higher operative risk (logistic EuroSCORE 22.4±18.3% *vs.* 35.0±17.1%, P=0.0002). Approximately 90% of TAVI-VIV cases were performed under local anesthesia, the procedure was significantly shorter than Re-AVR (217.3±71.3 *vs.* 58.7±34.9 min, P<0.001) and required significantly fewer transfusions of all types blood products (P<0.0001). One patient died during TAVI-VIV procedure and five patients died during the first 30-days in each group (9.6% *vs.* 7.4%, P=ns). One year probability of survival were comparable respectively (86.4% *vs.* 85.2%, P=ns). There was no differences in permanent pacemaker implantation, acute renal insufficiency, myocardial infarction and stroke (P=ns). Postoperative mean vavular gradients were comparable in both groups (18.2±10.6 *vs.* 16.8±8.6 mmHg, P=0.4). Mild paravavular leak were more frequent after TAVI-VIV (1.9% *vs.* 35.3%, P<0.0001). Mean length of intensive care unit and hospital stay were significantly longer in Re-AVR group (3.7±5.6 *vs.* 1.6±1.1 days, P=0.04; 12.0±8.8 *vs.* 7.4±1.8 days, P<0.0001).
CONCLUSIONS: Despite the higher risk profile, femoral TAVI-VIV ensures similar morbidity and mortality. Mild paravavular leak following TAVI-VIV occurs more often, although other hemodynamic outcomes are comparable. Transcatheter approach minimize the invasiveness of the procedure and appears to be safe and efficient alternative for surgical redo.

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Transapical TAVI in patients with complex aortic pathologies

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BACKGROUND: With complex aortic pathologies(cAP) like dissections or aortic arch aneurysm as well as previous surgery of the ascending aorta(AA) or aortic arch in combination with aortic valve disease(AVD) we are facing an even more complex patient population. This case series presents the treatment of patients with AVD and cAP through a transapical approach.
METHODS: Three patients (2 female, 1 male) presented with aortic insufficiency(AI) N.=2, aortic stenosis(AS) N.=1 and concomitant complex aortic pathologies underwent a transapical TAVI (TA-TAVI);

- Pat.1: uncomplicate type B dissection and a severe symptomatic AS, which had to be treated before TEVAR.
- Pat.2: severe AI after three operations on the AA and the aortic arch, overweight and reduced mobility due to multiple sclerosis. CT-Scan revealed an unfavorable angle of the apex to the AA and a gothic aortic arch.
- Pat.3: history of type A dissection with tirone david repair and severe AI. The grafted ascending aorta had a 90° angle in the mid portion.
- Pat.1&3: an Edwards Sapien 3 26mm and 29mm was used; in Pat.2: a JenaValve 27mm.

RESULTS: The TA-TAVI was performed uneventfully without any dynamics regarding the dissection membrane and with no incidence

of a paravalvular leak. The postoperative course was uneventful in all patients, except Pat. 1 who developed a left sided scotoma.
CONCLUSIONS: For positioning of the device in patients with gothic arches the transapical approach might be favorable due to the shorter way and therefore less loss of traction through the guidewire.
TA-TAVI is a safe treatment option for patients with type B dissection. Avoiding to pass the dissected aorta with the introducer sheet or penetrating the false lumen, the transapical approach enables a precise implantation of an aortic valve prosthesis without manipulating the dissection membrane with the device and therefore reducing the risk of redissection, retrograde dissection or rupture.

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Rescue procedures for TAVI: reducing time to sternotomy using checklist and actions

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BACKGROUND: Mechanical complications such as annular rupture, valve embolization and ventricular perforation occur in about 1% of TAVI procedures, carrying a mortality of more than 50%. Reducing low flow time and the time to correction of the mechanical defect is critical. Theses situations urge professionals from different specialties to convert the procedure from an interventional to a surgical setting. Communication, man-machine and man-equipment interactions must be controlled to be efficient.
METHODS: In this presentation we would like to present two emergency procedures designed by interventional cardiologists, surgeons, anæsthesiologists, together with nurses from those three specialities. The format is widely inspired by emergency procedure checklists and actions that one can find in the aviation sector. A pericardial drainage and a conversion to sternotomy procedure were created. Focus is made on actions each professional has to do to achieve the common goal. The chronologic "top-to-bottom" format anticipates conflicts with interdependent actions (such as parking the X-ray machine before draping for surgery). Checklists are reduced to the minimal killer items (such as heparin before ECC).
RESULTS: Implementing these procedures, we were able to reduce the time to sternotomy from 45 to 10min. We could also run on-site simulation sessions and enhance the procedure with feedback from each actor.
CONCLUSIONS: In the era of dramatic expansion of TAVI procedures and new insights towards extending the indications to low risk and young "operable" patients, efficient bailout procedures must be implemented. Written procedures are the corner stone of both training and improving the environment for a safer TAVI.

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Transcarotid access, an alternative approach for transcatheter aortic valve implantation: multicenter experience in France

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BACKGROUND: Transfemoral access constitutes the approach of choice for transcatheter aortic valve implantation (TAVI), but in 15-20% of patients this approach is precluded due to anatomical constraints. Several alternative accesses have been proposed. We discuss the feasibility, safety and analyze the results of TAVI performed through common carotid artery access.
METHODS: Between January 2013 and November 2017, in 205 consecutive patients (116 woman, 89 men; mean age 80,2 ± 9 years) with high or prohibitive surgical risk (mean Euroscore II 23 ± 13%), who are not eligible for transfemoral TAVI, we performed a transcarotid aortic valve implantation through the left (183, 89,2%) or right (22, 10,8%) carotid under general (167, 81,4%) or local (38, 18,6%) anesthesia. Four different French centers participated to retrospective study.
RESULTS: The procedure was successful in all patients, and no conversion was necessary. In 202 (98,5%) patients the procedure was performed as intended, in 3 (1,5%) patients the femoral or subclavian/axillary approach was converted to carotid approach. A self-expandable valve was used in 166 (81%) patients and a ballon-expandable valve in 39 (19%) patients. Thirty-day survival was 94%, 4 (2%) patients presented a major stroke, while 7 (3,4%) other a transient ischemic attack and 5 (2,4%) a minor vascular access site-related complication. Median follow-up is 3,5 years.
CONCLUSIONS: Transcatheter aortic valve implantation performed through common carotid artery access is a feasible and safe approach in selected patients and might be considered, as the first-line alternative access when transfemoral TAVI is precluded.

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Trans-apical transcatheter aortic valve replacement in complex aortic valve disease with J-Valve system

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BACKGROUND: J-Valve system is one special designed for trans-apical TAVR (Transcatheter aortic valve replacement) with three U-shape graspers. With the unique structure, J-Valve is suitable for both aortic stenosis and aortic regurgitation. We used the J-Valve system for patients with severe peripheral vessel disease and/or with artic regurgitation and received good clinical results.
METHODS: From January 2018 to December 2018, 12 patients (6 male, 6 female) underwent trans-apical transcatheter aortic valve replacement using J-Valve system. High risk patients with diseased peripheral vessel (fragile or calcification) and with valve disease aortic regurgitation were enrolled. 11 patients were suffered with both aortic stenosis (≥2,0-4) and aortic regurgitation (≥2,0-4), only one patient was only aortic stenosis but she had severe calcified aorta (porcelain aorta). The average preoperative STS score and EuroScore was 12.0 and 9.80, respectively. There patients had prior heart surgery history and one of them received bioprosthetic aortic valve valve-in-valve therapy.
RESULTS: The technique success rate was 100% and one patient was dead because of heart failure after TAVI (mortality 8.33%). One patient suffered stork and recovered well, no more other complication was observed perioperative. During the follow-up period, one patient was died because of acute heart attack. Other 11 patients completed TTE check. The rate of perivalvular leak (larger than moderate) was 0% and the rate of mild and trace leak was 18.18%. The postoperative average flow rate was 2.1m/s and average transvalve pressure difference was 15mmHg.
CONCLUSIONS: J-Valve system is a safe and effect method for high risk aortic valve disease patients not suitable for peripheral routine TAVI.

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The clinical relevance of transvalvular gradient on NYHA classification after transcatheter aortic valve-in-valve implantation

Farzaneh Seifi Zinab

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BACKGROUND: A trend toward biological valve implantation is a fact and we experience consequently a growing number of patients with degenerated bioprosthesis. Due to the "Russian doll effect", the Transcatheter Valve-in-Valve implantation (TAVI-VIV) is still limited and the clinical results after Re-intervention are debatable. The purpose of this paper is to evaluate the improvement of the NYHA score, mortality rate and their relationships with transvalvular gradient (TVG) in patients after TAVI-VIV Prosthesis.
METHODS: We conducted a retrospective study of 162 patients with a mean age of 75.8±9.7 years qualified for TAVI-VIV between March 2008 and October 2018. All included patients had degenerated surgical aortic bioprosthesis with a mean time from primary surgery 9.2±4.4 years. Approximately 95% of patients presented preoperative expressed heart failure symptoms (NYHA classification ≥III) with mean TVG 38.0±20.3 mmHg. Follow-up lasting 5.3±2.3 years was possible in 98.1% patients.
RESULTS: We recorded the postoperative TVG <20mmHg in 81.1% of patients, 84.0% of them presented NYHA class improvement from 3.3±0.5 to 1.7±0.7 with a five-year survival up to 65.0%. Postoperative TVG ≥20mmHg was noted in 15.8% of patients, 81.2% of them improved their NYHA class from 3.0±0.5 to 1.8±0.8 and 63.0% of them survived five years. During the follow-up period, 80.2% of patients presented NYHA I or II. Five patients died during the procedure due to left ventricle rupture (N.=3) or bleeding (N.=2) and 30-days mortality was 4.4%. A one-, three- and five- year probability of survival stratified with the use of Kaplan-Meier method was 81.7%, 67.5% and 62.2% respectively. We did not observe any association between postoperative increased TVG and NYHA class.
CONCLUSIONS: TAVI-VIV can be performed with an acceptable improvement of NYHA score. Despite the elevated postoperative TVG after TAVI-VIV, improvement of NYHA score justify this procedure.

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Transcatheter aortic valve replacement in patients with concomitant oncological pathology

Renat Akchurin, Timur Imaev, Alexey Komlev, Petr Lepilin, Dmitrij Salichkin, Alexander Kolegaev

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BACKGROUND: In patients with oncological disease aortal valve stenosis often becomes a contraindication for specific chemotherapy or surgical treatment. The main objective of our study was to determine the role of endovascular and hybrid aortic procedures in treatment of oncological patients with aortal valve stenosis. The role of transcatheter aortic valve replacement assessment in treatment of cancer patient was the aim of our study.
METHODS: 725 TAVI procedures were performed in department of cardiovascular surgery between 2010 and 2018. 135 (18,6%) of these patients had oncopathology. These cancer patients outcomes were analyzed.
RESULTS: Mean age was 76±4,2 years. Female gender was in a majority of cases (65%). 35 of these 89 women had a complete mastectomy in past medical history, and large majority of them in combination with X-ray therapy. Oncopatology profile of last patient included prostate cancer (15,5%), oncohaematological diseases (18%), gastrointestinal cancer (19%), gynaecologic cancer (15,5%), Hodgkin's granuloma (5%), skin cancer (5%), lung cancer (3%). All Hodgkin's granuloma patients had from 1 to 3 radiation regimens previously, therefore they had higher risk for traditional surgical treatment. There weren't intraoperative mortality in research group. 30 days mortality was 1,5% (2 cases): 1 stroke and 1 myocardial infarction. 57 patients (42%) after TAVI were referred for subsequent antitumor therapy, including for definitive surgery (prostatectomy, gastric resection, gastrectomy etc.).
CONCLUSIONS: Integration of TAVI procedure into cancer patient management increases therapy effectiveness and frequently TAVI is only chance for patient to get specific treatment.

Friday May 24, 2019
08:00 - 9:30

Cardiac Abstracts Session 5: Mechanical Support & Transplantation

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From the pioneering to the modern era: evolution of heart transplant through the last 30-years

Pasquale Totaro[1], Giulia Pisani[1], Carlo Pellegrini[1], Annalisa Turco[2], Elena Seminari[3], Stefania Guida[2], Angela Di Matteo[3], Stefano Pelenghi[1]

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BACKGROUND: Heart Transplantation (HTx) has been introduced in clinical practice in 1969. It is nowadays considered the gold standard therapy for patients suffering from end-stage cardiomyopathy and has been successfully performed in our center since 1985. Over this 30 years period there has been a significant evolution in both donors and recipients characteristics as shown by the recent benchmark from International Society of Heart and Lung Transplantation (ISHLT). Here we report the evolution of patients profile and clinical outcomes in our population correlated to the overall data from ISHLT.
METHODS: Overall 1107 patients underwent HTx at our center from November 19th 1985 to date. To analyze the evolution of candidate and donor criteria, patient population was divided in 4 groups according era of HTx, following ISHLT model (Group A from 1985 to 1991; Group B from 1992 to 2003; Group C from 2004 to 2008 and Group D from 2009 to date). Patients characteristics, donor criteria ad clinical outcomes were analyzed and compared within 4 groups.
RESULTS: Overall Kaplan-Meier survival curve correlates favourably with ISHLT data showing a 30 years survival approaching 50%. Stratification by era showed that age at transplantation, donor age, time on waiting list and cumulative ischemic time, all changed significantly and gradually from Group A to Group D. Kaplan-Meier curves (by era) demonstrated, furthermore, a significantly reduced 1-year survival in Group D compared to others 3 Group.
CONCLUSIONS: The significant changing characteristics of both recipients and donors, over 30 years of activity, had a significant impact in early postoperative survival following HTx. Although medium/long term outcomes are still satisfactory in patients surviving at least 1 year, these data clearly suggest the need of a more accurate patients selection and the evaluation of alternative treatment before patients conditions deteriorate while on waiting list.

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Determinants of clinical success in cardio-respiratory support with extracorporeal membrane oxygenation in different clinical scenarios

José M. González-Santos[1], Ramón-Adolfo Arévalo-Abascal[1], María-Concepción Rubia-Martín[1], Leyre Reta-Ajo[1], Rosa Diez-Castro[1], Francisco-Javier López-Rodríguez[1], María-Elena Arnáiz-García[1], Carlos Amorós-Rivera[1], Ana-María Barral-Varela[1], Paula-María Sánchez-Vicente[2], Marta González-Rodríguez[3]

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BACKGROUND: Cardio-respiratory support with extracorporeal circulation devices with membrane oxygenation (ECMO) are increasingly used. In veno-arterial (VA) disposition they allow the patients to be maintained alive until their cardiac function is recovered, upgrade to another type of longer support or cardiac transplantation. However, this therapy is not free of complications and it is essential to identify the factors related to their clinical success.
METHODS: We analyze our results with the use of ECMO in 86 consecutive patients, 64 men and 22 women (median age 62 years) in different clinical scenarios: cardiac arrest (38), post cardiotomy (25), cardiogenic shock (17) and arrhythmic storm (6). The success of the therapy was defined as the withdrawal of the ECMO by improvement of the cardiac function or the maintenance of the patient alive until the upgrade to another device or cardiac transplantation. The determinants of clinical success were investigated through uni and multivariate analyses.
RESULTS: 35 patients (46.7%) died while on ECMO. 9 patients (10.5%) were bridged to another therapy (1 surgery, 5 upgraded to a different device and 3 transplanted, one previously upgraded to another device) with 6 (66.6%) being discharged alive. In 42 patients we could directly explant the ECMO, being 27 of the patients (64.3%) discharged alive. ECMO therapy was considered successful in 51 patients (59.3%). Univariate analysis found significant differences between successful and unsuccessful support in the use of distal limb perfusion, use of hemofilters, occurrence of infectious or device-related complications, and duration of support therapy. However, only the implementation of distal perfusion appeared as an independent determinant of clinical success.
CONCLUSIONS: Cardio-respiratory support with VA ECMO allows the rescue of a high percentage of patients in critical circulatory situation. The maintenance of distal limb perfusion, whenever femoral access is used, is associated with a higher clinical success rate.

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Clinical outcome of postoperative extracorporeal membrane oxygenation support in stanford type A aortic dissection

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BACKGROUND: Stanford type A Aortic dissection(TAAD) is a fatal cardiovascular disease. Surgery is the only effective method to save life. However, severe circulatory and/or respiratory dysfunction after operation is not rare. Extracorporeal membrane oxygenation(ECMO) may be applied to reduce mortality. We analyzed the data of TAAD patients with postoperative ECMO support to assess the clinical outcome.
METHODS: From Janurary 2013 to December 2018, all clinical data of TAAD patients with postoperative ECMO support in our institution were collected. Cases with redo or without complete data were excluded.
RESULTS: 19 cases were enrolled, 16 male and 3 female. The mean age was 53.16±11.68 years. 17 patients underwent VA-ECMO treatment and 2 patients received VV-ECMO support. The causes of ECMO support included heart failure in 13 patients, heart and lung faliure in 2, severe acidosis in 2 and sole respiratory failure in 2. The mean support time was 82.68±74.45 hours. 7 patients were successfully weaned from ECMO. Of them, 2 patients were finally dead from sepsis. The survival rate was 26.32%(5/19).
CONCLUSIONS: The mortality of TAAD patients with postoperative ECMO support seems to be higher than conventional cardiac surgical patients with postoperative ECMO support. When TAAD patients are complicated by severe circulatory and respiratory dysfunction after operation, ECMO is still considered to save life. But more experience need to be accumulated to increase survival rate.

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Single center 25-years experience with left ventricle assist device as bridge to cardiac transplantation

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BACKGROUND: Heart transplantation is still the gold standard therapy for patients suffering from end stage cardiomyopathy. Left ventricle assist devices (LVAD) implantation has been proposed as an effective therapy for bridge to transplant for patients in waiting list for cardiac transplant with severely impaired clinical conditions, or as destination therapy for patients not eligible for heart transplantation. Here we report our single-centre 25-years experience with LVAD implantations as bridge to transplantation therapy.
METHODS: Over >25 years period, 92 patients underwent LVAD implantation. 14 patients (16%) received a LVAD as destination therapy, 78 patients (84%) received the LVAD as bridge to transplant therapy and represents the cohort of present study. 60 patients (77%) received a pulsatile flow type of device, 18 (23%) received a continuous flow type of device. Follow-up was completed in all patients. Survival rate, and length of assistance was analyzed. Long term outcome of patients who reached the main goal of the LVAD therapy (Heart Transplantation) was also analyzed.
RESULTS: In 4 patients LVAD is still in place (range of assistance from 135 to 1465 days). Among the patients no longer in assistance 26 patients (33%) died before heart transplant (longest assistance 749 days) and did not reach, therefore, LVAD therapy's goal. 48 patients (61%) reached the goal therapy and were transplanted (longest assistance 1332 days). Kaplan-Meier curve (intention to treat analysis) showed a survival rate of 70% at 6 months and 47% at 5 years. Long term survival analysis for patients who reached the heart transplant showed 70% rate at 6 months and a slowly further decline (50% at 20 years).
CONCLUSIONS: Our >20 years experience clearly shows that LVAD therapy as bridge to transplant allows satisfactory results in terms of goal achievement. LVAD implantation, moreover, did not negatively impact post-transplant long term survival.

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Use of recombinant factor VIIa for refractory hemorrhage during ECMO while treating primary organ dysfunction

Dhaval Naik, Dhiren Shah, Manan Desai, Niren Bhavasar, Chintan Sheth, Hiren Dholakia, Ulhas Padiyar, Dhanyata Dholakia, Prashant Nair, Amit Chandan, Milan Chag

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BACKGROUND: A case report of a patient with recombinant factor VIIa (rFVIIa) for severe hemorrhage associated with extracorporeal

membrane oxygenation (ECMO) in case of Primary organ dysfunction following orthotopic heart tranaplantation.
METHODS: A 22 years old male patient with a dilated cardiomyopathy who had undergone an orthotopic heart transplant treated with venoarterial ECMO postoperatively for primary organ dysfunction. Central V-A ECMO was estabilished for primary organ dysfunction. LV apical vent was connected to circuit.He had contineous bleeding due to prolong surgery and use of extracorporeal circulation.He required massive transfusion to maintain intravascular blood volume and replace clotting factors. He was given rFVIIa and cell saver system was used to reduce bleeding. Heart was frequently evaluated for any incidence of clots using TEE. No evidence of abnormal thrombus formation was noted in their respective ECMO circuits but LV vent.
RESULTS: Patient was weaned succesfully from V-A ECMO as transplanted heart started working normally.patient was discharged home in stable heamodynamic condition.
CONCLUSIONS: Despite theoretical and practical concerns of thrombosis, this case publish that there may be a role for the cautious use of rFVIIa in treating severe and intractable hemorrhage associated with ECMO in heart transplanted patients with primary organ dysfunction.

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Treatment of Heart Mate III-LVAD driveline infection by vacuum assisted closure

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BACKGROUND: Drive-line infection is one of the most frequent complications following LVAD treatment and there is no consensus about the management of this important clinical problem. The standard approach to treat the foreign-body infection is complete device ablation which is not always feasible and preferred method. Here we share the results of our small case series who had a minimal invasive treatment method by Vacuum Assisted Closure (VAC®- KCI-Texas-USA).
METHODS: Between 2016 and 2019, three male patients hospitalised in our unit with the diagnosis of driveline infection of Heart Mate III-LVAD (56-78-46 years old, all with Methicillin Sensitive Staphylococcus Aureus infection). The diagnosis and localisation of the infection- abscess formation is confirmed by the thoraco-abdominal CT. Following antibiotic treatment an immediate operation is performed in order to drain the abscess and to execute debridement of the infected tissues. At the end of the procedure, VAC was applied. VAC dressing and debridement of the wound are performed every 3-4 days. The wound closed surgically after obtaining negative culture results and observing good healing response.
RESULTS: The patients were discharged in good condition, without signs of infection. One patient underwent successful heart transplantation 3 months later. During the transplant surgery, no sign of residual infection along the HeartMate III drive-line was observed. Other two patients did not show any residual and repetitive infection.
CONCLUSIONS: Drive-line infection following LVAD implantation is an important complication and management is challenging for the surgical team and the patient. Device ablation and reimplantation of a new device is the most radical but not the simplest way to treat driveline infection. The results of our case series report presents a successful and less radical approach for the treatment of LVAD driveline infections.

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Cessation of anticoagulation in HEARTMATE 2 support

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BACKGROUND: Although the Heartmate 3 LVAD has replaced Heartmate 2 (HM2) as the pump of choice for patients requiring chronic mechanical cardiac support, thousands of patients remain supported with HM2. They suffer the known risks of gastrointestinal bleeding (GIB) and pump thrombosis (PT). Discontinuing anticoagulation completely in the setting of recurrent GIB is a strategy we employ in our practice. To quantify the risk of this strategy to our patients, we reviewed our database of HM2 patients.
METHODS: We retrospectively reviewed all HM2 patients implanted from 2010 to 2017. Required for inclusion were discharge from LVAD implantation hospitalization, admission for at least 2 non-surgical bleeding events and all anticoagulation/antiplatelet medications held for at least 90 days. The index bleeding event was that which triggered withdrawal of anticoagulation. Major outcome studied was thrombotic events off anticoagulation.
RESULTS: 86 HM2 patients were discharged. Six patients had all anticoagulation withheld (7%). In all cases the index bleeding event was a GIB. Baseline characteristics of the group were: female 14%, median age 63 years (range 35-73), (BMI (31.1 = /- 6.1) and indication (Destination Therapy, [DT] 85%). The mean time off all antithrombotics was 720 days (SD 511; range 279-1,394). There were no deaths in patients off anticoagulation. Only one patient developed PT in the setting of driveline infection at 1 year after anticoagulation was withheld. He required pump exchange. The rest remained without thrombotic events including cerebrovascular or peripheral embolization. The incidence of thrombotic events was 0.08/Person-Year.
CONCLUSIONS: In our population of mostly older male DT patients with HM2 who had complete cessation of all anticoagulation due to recurrent GIB, thrombotic complications were uncommon. Judicious extension of this strategy to other populations of patients suffering from recurrent GIB who remain supported with HM2 might be considered.

Friday May 24, 2019
08:00 - 9:30

VASCULAR ABSTRACTS
SESSION 6: CAROTIDS

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Family history and polygenic risk of cardiovascular disease: independent factors associated to secondary cardiovascular outcome

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BACKGROUND: Family history (FHx) of cardiovascular disease (CVD) is a well-known risk factor for CVD. Large-scale genetic studies have identified numerous loci for CVD, underscoring its polygenic nature. However, little is known about the influence of positive FHx and the polygenic burden on atherosclerotic plaque composition nor secondary cardiovascular events.
METHODS: 1,994 carotid endarterectomy patients from the Athero-Express Biobank were included. FHx was defined as having parents or siblings who developed CVD before the age of 60, determined by questionnaire. A weighted polygenic risk score (PRS) for CVD was calculated based publicly available data. Atherosclerotic plaques were analyzed for macrophages, smooth muscle cells, intraplaque hemorrhage (IPH), calcifications, lipid core size, intraplaque vessels, and collagen content. We assessed the impact of FHx and PRS on plaque composition and secondary cardiovascular event-free survival through logistic and Cox-regression modelling.
RESULTS: Positive FHx (N.=838, 42%) was associated with higher risks of secondary cardiovascular events during 3-years of follow-up, adjusted hazard ratio (HR) 1.39, 95% CI 1.10-1.77, P=0.006. Patients with a high genetic risk (those in the top 20% of the PRS distribution) had more secondary cardiovascular events during follow-up compared with those in the bottom 20% (adjusted HR 1.52, 95% CI 1.07-2.1, P=0.019), even after correction for cardiovascular risk factors including FHx. High PRS was associated with more vulnerable plaque characteristics, including IPH, adjusted odds ratio (OR) 1.62 95% CI 1.03-2.56 (P=0.038) and more fat, adjusted OR 1.73, 1.06-2.84, (P=0.029).
CONCLUSIONS: Both positive FHx and higher PRS were independently associated with more secondary cardiovascular events. Also, higher PRS was correlated with more vulnerable plaques. This study supports the idea of including PRS additional to FHx in personalized risk assessment and the concept of using genetic data for selecting high-risk study populations when exploring new therapeutic strategies of CVD prevention.

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Correlation between intraplaque hemorrhage and new silent brain ischemia prior to carotid endarterectomy

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BACKGROUND: Intraplaque hemorrhage (IPH) has been independently associated with a higher risk in ipsilateral stroke and is more often seen in symptomatic carotid artery patients compared to asymptomatic patients. Risk assessment of recurrent cerebrovascular events based on plaque characteristics may also be helpful in prioritizing patients for carotid revascularization. We hypothesize that patients showing histologically apparent signs of IPH in the atherosclerotic plaque (excised during carotid endarterectomy) have an increased risk of recurrent ischemic brain lesions in the time interval between index event and revascularization.
METHODS: A retrospective analysis was performed based on prospectively collected data of patients included simultaneously in the MRI-substudy of the international carotid stenting study (ICSS) and the Athero-Express (AE). Patients randomized for carotid endarterectomy were operated between October 2003 and October 2008. Atherosclerotic plaques were analyzed for presence of IPH, and six other markers. MRI was performed 1-3 days prior to CEA. Primary outcome parameter was presence of ipsilateral ischemic lesions on MR-DWI appearing hypo-/isointense on apparent diffusion coefficient, thereby excluding lesions > 10 days old, and it's correlation to IPH.
RESULTS: A number of 53 patients were included in the study. Univariate analysis of patients without (N.=40) and patients with ≥1 (N.=13) ipsilateral DWI lesions on pre-operative scan revealed differences in IPH (respectively 60.0% *vs.* 92.3%). However, presence of a large (≥40%) lipid core was more frequently seen in DWI-negative patients (57.5%) compared to those with ≥1 lesion (23.1%). After adjustment for age and type of qualifying symptom, these plaque characteristics retained independently associated with presence of DWI lesions on pre-operative MRI.
CONCLUSIONS: In symptomatic carotid patients, IPH is associated with an increased risk of new silent brain ischemia on MR-DWI during the waiting period until revascularization. Screening for IPH at f hospital presentation may help in prioritizing patients for timing of treatment.

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Analysis of the carotid artery and atherosclerotic plaque growth using the patient-specific parameters

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BACKGROUND: The main aim of this study was to computationally model the biological and mechanical processes related to the plaque initiation and progression, as well as to predict plaque regions and mechanisms which are prone to atherosclerosis development. The created multiscale model included the patient-specific parameters needed for the 3D geometrical reconstruction of carotid artery and its biological characterisation, in order to computationally simulate the plaque growth.
CASE REPORT: The patient-specific plaque characterization and 3D carotid reconstruction are based on the medical imaging techniques (using MRI, US, CT), which are performed for creation of refined models and detailed analysis. The 3D blood flow was governed by the Navier-Stokes equations and continuity equation. Mass transfer within the blood lumen and through the arterial wall was coupled with the blood flow and modelled by the convection–diffusion equations, while Kedem-Katchalsky equations described the Low-Density Lipoprotein (LDL) transport in the arterial lumen. Appropriate boundary conditions were prescribed. The shear stress distribution and the blood flow characteristics along the carotid artery were analysed at the plaque initiation and follow-up time steps. Analysing the shear stress distribution at the baseline, the zone of a low shear stress indicated the greatest risk of plaque progression, which was confirmed after the follow-up. Atherosclerosis development leaded to increasement of plaque volume and decreasement of lumen diameter, which was followed by reduced blood flow through the stenotic zone and higher shear stress.
Recent advances in both computational fluid dynamics and imaging techniques have contributed to the modelling of atherosclerotic plaque formation and progression. This approach will be further improved and used for risk stratification models, by detecting the parameters of unstable and stable carotid plaques related to the risk of stroke, which is objective of our future studies.
ACKNOWLEDGEMENTS: This paper is supported by TAXINOMISIS project (H2020-No755320) and Serbian projects III41007, ON174028.

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Simultaneous coronary artery bypass grafting and carotid endarterectomy: decision making, results

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BACKGROUND: Optimal surgical approach for the treatment of patients with severe combine carotid and coronary disease remains a contentious

issue. We present our experience in simultaneous carotid endarterectomy (CEA) and coronary bypass graft (CABG) surgery.
METHODS: Out of 3084 patients who underwent CABG in 2008-2018 in our center, 99 (84 males, mean age 61.6±8.2 years) were identified as having both severe carotid stenosis and multivessel/left main coronary artery disease and, therefore, indications to combined surgery. The approach to deciding was as follows. Indications for simultaneous CEA+CABG were not discussed in cases of unilateral carotid stenosis≥70% with peak systolic velocity>200 cm/s (ultrasound data), confirmed CT scan, in symptomatic patients. In cerebral asymptomatic patients we considered the combined surgery indicated if:1) there was a significant bilateral carotid lesion, 2) there was an unilateral carotid stenosis≥70% accompanied by "silent" ischemic foci, detected by MRI, in the ipsilateral hemisphere, 3) the peak systolic velocity was very high (≥400cm/s), 4) there were signs of compensation for cerebral blood flow deficit activating as evidenced by Doppler research of intracranial circulation. CEA was performed under general anesthesia before CABG, the mean clamping time was 31±6 min. Surgery was performed using microscope and microsurgical instruments. Mean aortic cross-clamp and cardiopulmonary bypass time were 63±24 min and 98±34 min respectively.
RESULTS: Using this approach, we obtained acceptable hospital results. One patient died of heart failure in the postoperative period (1,0%). One patient (1,0%) suffered an ischemic ipsilateral stroke, its cause – cardioembolism (duplex sonography didn't reveal the sings of thrombosis in operated artery). 6 patients (6,1%) developed with transient encephalopathy without focal brain lesions by MRI.
CONCLUSIONS: Simultaneous surgery is a safe option in the treatment of patients with concurrent carotid and coronary arteries lesions when a two-stage approach is conjugated with a high risk of postoperative complications.

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Early carotid endarterectomy after acute neurological deficit improves neurological recovery

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BACKGROUND: The aim of this study is to compare the difference in the rate of neurological recovery in patients with early carotid endarterectomies (CEA) compared to delayed CEA after acute ischemic neurological deficits (TIA/CVI).
METHODS: A total of 157 subjects in the prospective study were monitored for 30 days postoperatively. Group I -early CEA, had 50 subjects who were operated from 3 to 14 days after the TIA/CVI. Group II-delayed CEA, had 107 subjects who were operated from 15 to 180 days after the TIA/CVI. Rankin score (mRS) was used to estimate neurological disability. We have formed two subgroups of mRS <3 and mRS 3.
RESULTS: In group I, the average time to intervention was 9.5 days, and in group II 72.22 days. There was no mortality in both groups. The CVI/IM/death rate was in group I was 4.0% and in group II it was 4.7% (P> 0.05). The improvement of the mRS in group I was 52%, and in group II 31.8% of patients (P <0.01). The relative risk is 2.4 or more times the greater chance of a change in the mRS if patient is in the group I. The decrease in the mRS that occurs between the third and the tenth day after the CEA is statistically significantly higher in the group I. In patients with TIA, in more than 60% of cases, there was a decrease in mRS, and in those with CVI in about 25.5% (P <0.01). In the Rankin range of subgroup mRS <3 and mRS 3, the decrease was significant in terms of time and by subgroup, but a far faster decline was observed in subgroup mRS <3 .
CONCLUSIONS: Early CEA after acute neurological deficit improves neurological recovery of patients, especially those with mRS <3 scores.

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Impact of diabetes mellitus on early outcome of carotid endarterectomy

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BACKGROUND: Diabetes mellitus increases the risk of ischemic stroke in general population, but its impact on early outcome after the carotid endarterectomy (CEA) is controversial with conflicting results.
METHODS: This prospective study includes 902 consecutive CEA. Patients were divided into non-diabetic and diabetic group and analyzed. Early outcomes in terms of 30-day neurological events and death rates were analyzed and compared.
RESULTS: There were 606 non-diabetic patients. Among 296 diabetic patients, 83 use insulin for blood glucose control. The mortality rate was 0.66%. There were 33 (3.66%) neurological complications. Stroke was more frequent in the diabetic group (2.0% *vs*. 4.4%, P=0.04) comparing to TIA (0.7% *vs*. 1.4%, P=0.45). Mortality was statistically more frequent in diabetic patients (0.2% *vs*. 1.7%, P=0.01). The 30-day neurological complications/mortality rate was statistically higher in the diabetic group (2.6% *vs*. 5.7%, P=0.02). Diabetes mellitus (OR = 1.84, 95% CI 1.39- 4.59, P=0.03) and use of insulin for blood glucose control (OR = 2.61, 95% CI 1.78- 4.80, P=0.01) were identified at multivariate analysis as predictors of a poor early outcome after CEA. Among diabetics, patients with HbA1c >7% had also a higher risk for complications (OR = 1.28, 95% CI 1.05-1.66, P=0.03). At multivariate analysis, higher low-density lipoprotein cholesterol value (OR = 1.25, 95% CI 1.11-1.98, P<0.04), presence of coronary disease (OR = 1.94, 95% CI 1.41-3.27, P=0.03), peripheral artery disease (OR = 2.30, 95% CI 1.48- 3.80, P=0.01), complicated plaque (OR = 1.82, 95% CI 1.20-3.83, P=0.03), contra-lateral carotid artery occlusion (OR = 2.46, 95% CI 1.37-4.91, P=0.01), carotid cross clamping intolerance (OR = 3.15, 95% CI 2.13-8.07, P<0.01) and shunt use (OR = 3.19, 95% CI 1.18-8.10, P<0.01) were also identified to increase risk of early complications.
CONCLUSIONS: In our study perioperative neurological complications and mortality were statistically higher in diabetic patients compared to non-diabetic patients during CEA. Further research will have to show whether other treatment modalities of carotid artery stenosis and better glycaemia and dyslipidemia controlling in diabetics can reduce this risk.

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Clinical outcomes after carotid endarterectomy in presence of contralateral carotid occlusion

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BACKGROUND: The optimal management for carotid stenosis in presence of contralateral carotid occlusion remains controversial. The aim of

the present study was to inverstigate the periprocedural outcome of the carotid operation in patients with contralateral carotid occlusion compared with those without haemodynamically significant contralateral carotid artery stenosis.
METHODS: This retrospective, single-center study including 302 consecutive patients submitted to carotid operation between October 2011 and January 2017. The operative technique consisted of the carotid endarterectomy with bovine pericardium patch closure under general anesthesia and selective use of carotid shunt. 32 patients (10.5%) presented with contralateral carotid occlusion and served as the observation group (O group) were compared to the remaining 270 patients (89.5%) without significant stenosis of contralateral carotid artery, served as the control group (C group). Outcome measures included the periprocedural rate of stroke, transient ischemic attack (TIA), myocardial infarction (MI), mortality and the need for a shunt placement.
RESULTS: The overall stroke rate was 0% (N.=0 of 32) for O group and 0.7% (N.=2 of 270) for C group. The TIA rate was 3.1% (N.=1 of 32) for O group and 0.3% (N.=1 of 270) for C group. The MI rate was 0% (N.=0 of 32) for O group and 1.8% (N.=5 of 270) for C group. The periprocedural mortality was 0% (N.=0 of 32) in O group and 1.1% (N.=3 of 270) control group. In O group the need of shunt placement was higher (15.6% *vs.* 7.9%).
CONCLUSIONS: In our experience carotid endarterectomy operation in presence of contralateral carotid occlusion with selective use of carotid shunt do not seem to be at increased risk for periprocedural mortality, myocardial infarction and neurological complications.

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Workflow for blood flow studies in patient-specific carotid artery aneurysms

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BACKGROUND: Treatment choice for extracranial carotid artery aneurysm (ECAA) depends on the patient-specific situation. Blood flow patterns may be predictive for natural course outcome and may also influence choice of technical treatment. We present a novel workflow that uses CT angiography (CTA)-data to define a patient-specific ultrasound and numerical model to analyze the effect of stent placement on blood flow dynamics.
METHODS: The workflow consists of several steps. First, carotid CTA-data including an ECAA is segmented, exported as SurfaceTesselationLanguage (STL)-model and 3D-printed. Then, this model serves as a mold for the poly (vinyl alcohol) (PVA)-ultrasound phantom. The STL-model is also converted to a masking function for numerical flow simulations. High-frame-rate contrast-enhanced ultrasound combined with particle image velocimetry (echoPIV) measurements are compared to numerical results and clinical Duplex data to validate the physical properties of the phantom. Finally, flow experiments are performed in a stented phantom and numerical model.
RESULTS: Segmentation, 3D-printing and numerical simulations of realistic blood flow are performed for one patient-specific ECAA case. Other steps of the workflow are validated using a simplified model, which is based on common ECAA morphology. For this ECAA model, a PVA-phantom is successfully fabricated, and a masking function is generated. EchoPIV measurements and numerical simulations show similar flow patterns inside the aneurysm sac. Numerical results for the stented geometry introduce reduction of 25% for the blood flow inside the aneurysm compared to the non-stented case.
CONCLUSIONS: A novel workflow for ultrasound and numerical flow studies is presented. This workflow uses clinical CTA-data to fabricate a patient-specific ECAA model. It enables phantom fabrication of complex patient-specific aneurysm geometries, which physical properties can be validated using clinical flow data. It may become a promising tool for predicting the effect of stent placement on blood flow dynamics.

Friday May 24, 2019
08:00 - 9:30

Vascular Abstracts Session 7: Endovascular Procedures

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Double homemade fenestrated stent graft for total endovascular aortic arch repair

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BACKGROUND: The aim of this retrospective analysis was to evaluate outcomes of homemade double fenestrated stent graft for total endovascular aortic arch repair: one proximal large fenestration for the brachiocephalic trunk (BT) and the left common carotid artery (LCCA) and one distal fenestration for the left subclavian artery (LSA).
METHODS: From January 2017 through December 2018, 30 patients underwent TEVAR with double homemade fenestrated stent graft for total endovascular aortic arch repair to preserve the patency of the supra-aortic trunks. Elective cases accounted for 73.3% (N.=22) of the sample. Indications included degenerative aortic arch aneurysm (N.=13), dissecting aortic arch aneurysms subsequent to surgical treatment of acute type A dissections (N.=7), chronic complicated type B aortic dissection (N.=8) and acute complicated type B aortic dissection (N.=2).
RESULTS: Median duration for stent graft modification was 19 minutes (range 16-20 minutes). Technical success was achieved in 29 of 30 patients. Misplacement of a stent-graft lead to coverage of the BT and LCCA. The chimney technique was performed to restore the blood flow. Two LSA catheterization failed and LSA revascularization was performed by carotid axillary bypass by additional stent-graft placement. Additional planned endovascular procedure was required in 3 patients. One patient had a stroke without permanent sequelae. Overall mortality was 3.3%. All left supra-aortic trunks were patent. No type I endoleak was observed. We only observed one patient with a type II endoleak. During a mean follow-up of 13 months, there were no conversions to open surgical repair, aortic rupture, paraplegia, retrograde dissection.
CONCLUSIONS: The use of double homemade fenestrated stent graft is both feasible and effective for maintaining the patency of the supra-aortic trunks and allows total endovascular aortic arch repair. Durability concerns will need to be assessed in additional studies with long term follow-up.

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Treatment of aortic dissection type B involving aberrant right subclavian artery using fenestration technique

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BACKGROUND: For the endovascular treatment of type B aortic dissection, at the same time of effectively closing or blocking the gap of

the false lumen, guarantee the blood supply or flow of the aortic arch branches, and it is the key point of the success of this operation. Aberrant right subclavian artery is a common congenital malformation of Stanford type B aortic dissection. Because of the orifice of ARSA is always too close to the aortic dissection's tear, by using the thoracic endovascular aortic repair is really difficult because of the complications such as Brain ischemia for example. Ex Vivo Fenestration technique is a feasible method for revascularization of aortic arch aberrant right subclavian artery.
METHODS: From January 2013 to January 2018 in our hospital, 9 patients were reviewed with ARSA with type B aortic dissection. The orifice of the ARSA most of the time is very near or opposite the Gap of the dissection, and we use completely stent graft + Ex Vivo Fenestration technique. In advance we did an open window for the aberrant right subclavian artery on the stent graft and we proceed with TEVAR operation.
RESULTS: All the 9 patients survived the operation. Hospitalization duration was 8(7-14) days. One patient postoperative has symptoms of left upper limb ischemia, CTA shows a formation of the thrombus at the window's spot. Reoperation was needed and we did auxiliary artery to auxiliary artery revascularization operation. The rest of patients had no symptoms of left upper ischemia or nervous system complications. There were no immediate complications and no evidence of endo-leaks in 3 months postoperatively. All the Supra-aortic vessels including aberrant right subclavian artery were patent.
CONCLUSIONS: The application of *ex vivo* fenestration for revascularization of aortic with aberrant right subclavian artery during TEVAR is safe and feasible.

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Geometrical changes over time in bridging stents after branched and fenestrated endovascular repair for TAAA

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BACKGROUND: To assess long-term durability of bridging stents in branched and combined branched/fenestrated endovascular aneurysm repair (b/f EVAR) for thoraco-abdominal aortic aneurysm (TAAA) and pararenal abdominal aortic aneurysm (pAAA).
CASE REPORT: A retrospective database analysis was performed on patients treated by b/f EVAR for TAAA. Computed tomography angiographies (CTA) were analyzed to assess patency, bridging stent angulation and migration, aneurysm diameter and migration of the endograft. Twenty-eight patients with median age of 70 years (interquartile range (IQR) 67-77) were included. Assisted technical success was 89%. Within 30 days post-operatively five patients died. In the remaining 23 patients median follow-up was 5.3 years (IQR2.9-7.2) and 1-, 3-, and 5-years estimated overall survival was 69%, 65% and 44%, respectively.
During follow-up 12/47(26%) branches occluded and 5/47(11%) branches developed a 70-99% stenosis. One-, 3- and 5-year estimated freedom from branch stent adverse events was 74%, 71% and 56%, and fenestration stent adverse events 100%, 96% and 89%, respectively.
The median distal bridging stent migration was 0.5mm (IQR-1.9-1.4). In 10 branches migration over 10mm was seen, ranging from 14.1mm sliding in to 23.0mm sliding out. The angulation between branch and stent became 4º more angulated (IQR-14 to +2). In 23 branches the angulation changed 10º or more, leading to an occlusion in seven, a 70-99% stenosis in three and a 50-70% stenosis in four. In three cases the endograft migrated >5mm caudally, with a breach in a fenestration stent in one and a breach in a branch stent in another.
The anatomical configuration of branches in b/f EVAR of TAAAs and pAAAs changes over time. The change in angle of branches and the bridging stent influences the likelihood of stenosis and occlusion. Follow-up of b/f EVAR should include CTA measurements of aortic diameter, endograft migration, target vessel stent length and angulation, to detect disconnection, stenosis and occlusion.

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Outcome of percutaneous versus open cut-down in EVAR: a review and a multicenter clinical trial

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BACKGROUND: Arteriotomy closure devices (ACD's) permit percutaneous closure of arterial access of the common femoral artery (CFA). Reports about their superiority were conflicting. The number of complications, the duration of operation and hospitalization were examined in a systematic review. Both access techniques were investigated in a randomized multicenter trial using both techniques in one similar patient, with regard to complications and patients' opinion.
METHODS: The Cochrane library, Medline and Embase databases were searched. Articles were included concerning femoral punctures of 12 French, or more. Complications, procedure times, and length of hospital stay were evaluated. Simultaneously, patients indicated for elective endovascular aneurysm repair (EVAR) were randomized for percutaneous or surgical cut down. Clinical control was performed one day, 2 and 6 weeks postoperatively. Patients' visual analogue scale (VAS) was asked one day and 2 weeks after the operation.
RESULTS: The systematic search produced 746 articles, 227 were retrieved for abstract review. Seventeen relevant articles, six of which were prospective, enabled research on 7,889 femoral artery access sites. Conversion to open access was reported in 168 cases (5.7%), unrelated to ultrasound-guided access. Percutaneous access had a lower likelihood of developing SSI (odds ratio (OR) = 0.38), wound dehiscence (OR = 0.14), and seroma formation (OR = 0.15). Duration of surgery and length of hospital stay were not statistically different. Included in the randomized trial were137 groins. SSI rate was 1.5% in the open group versus 0% in the percutaneous group (NS). Wound complications were comparable in both groups. Adjusted pain score was 0.69 lower, in favor of percutaneous access. Wound assessment was better after 2 weeks (OR = 3.57) in favor of percutaneous access.
CONCLUSIONS: Percutaneous closures of arterial punctures of the CFA are followed by a significantly lower amount of complications. It does reduce pain the first day after intervention. Duration of surgery or hospitalization is not shortened.

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Incidence, natural course and outcome of type II endoleaks in infra-renal EVAR, the engage registry

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BACKGROUND: To report the incidence, natural history and outcome of type II endoleaks in the ENGAGE registry.
METHODS Patients were extracted from the prospective global post-marketing ENGAGE registry. Two groups were analyzed, first patients with an isolated type II endoleak and second patients with a type II endoleak that later presented with a type I endoleak. A health status analysis between patients with an early type II endoleak versus no endoleak was performed. Second, an attempt was made to identify risk factors in patients with a type II endoleak that later presented with a type I endoleak.
RESULTS: Through 5-years, 197 (15.6%) patients with isolated type II endoleaks were identified (within 30 days N.=73, 37.1%, through the first year N.=73, 37.1% and the remainder after 1 year follow-up N.=51, 25.8%). A type II endoleak resulted in a higher incidence of aneurysm growth and more secondary endovascular procedures (15.4% *vs.* 7.5% at 5 years, P<0.001). Overall survival was higher in the isolated type II endoleak group compared to patients with no endoleak (77.2% *vs.* 67.0% at 5 years, P=0.010). Twenty-two patients (10%) with a type II endoleak were diagnosed with a late type I endoleak (type IA N.=10, type IB N.=12), with a secondary intervention rate of 67.5% through 5 years. There was no difference in health status scores between the groups.
CONCLUSIONS: In the ENGAGE registry isolated type II endoleaks are present in 15.6% of patients during follow-up. The majority are not of concern and an early isolated type II endoleak does not impact health status through 1-year. However a small group of patients with a type II endoleak will present with a type I endoleak resulting in a high secondary intervention rate and significant risk of aneurysm related complications.

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An alternative way to treat iliac aneurysm

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BACKGROUND: Isolated iliac aneurysms or combined with aortic aneurysms can be treated through implantation of three balloon expandable polytetrafluoroethylene-covered stents in order to create a new iliac bifurcation. We present nine patients, unfit for open surgery and anatomically non suitable for conventional endovascular approaches, in which covered stent endovascular reconstruction of the iliac bifurcation (CERIB) was performed.
METHODS: We treated nine patients .Five were treated for concomitant abdominal aortic aneurysm. The mean diameter and length of the common iliac artery (CIA) were 10.44 mm and 52.12 mm respectively; iliac axes had calcifications and angulations which did not allow conventional techniques. All patients had contraindications for commercially available iliac branch devices. This technique consists in the deployment of two covered stents in external iliac artery and internal iliac artery in kissing stent configuration, after the deployment and overlapped into a larger covered stent in the CIA, such to reconstruct the iliac bifurcation. The stents we used were BeGraft® and VBX Viabahn® stents, delivered from a low profile delivery system. The CIA stent was introduced and deployed from the ipsilateral side. A femoral femoral through and through wire or an axillary femoral through and through wire were performed to gain access to the internal iliac artery.
RESULTS: Technical success was achieved in all procedures. None of the patients had endoleak at the end of the surgery or developed thrombosis of the stent neither pelvic or leg ischaemia. All patients underwent CT angiography one month after the surgery. We reported only one case of endoleak type III four months after the procedure which was resolved with a further balloon dilatation.
CONCLUSIONS: The CERIB technique allows to extend the possibility to treat isolated iliac aneurysms and aorto iliac aneurysms with endovascular approach to cases with a narrow or short common iliac artery

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Results of covered endovascular reconstruction of aortic bifurcation (CERAB)

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BACKGROUND: Extensive aorto-iliac occlusive disease can be treated by endovascular CERAB technique. This has the potential to replace open reconstruction and lead to decreased morbidity and shorter hospital stay. CERAB can be performed entirely via percutaneous femoral access under local anesthesia. After recanalization, a balloon expandable covered stent is placed in the distal aorta above the bifurcation. Second, balloon expandable covered stents are placed proximally in the tapered part of the aortic stent graft extending into the iliac arteries, finishing the neo-bifurcation. This study reports single center midterm results
METHODS: During the period from 2012 until 2016, patients treated with CERAB were prospectively entered in a database. The aortic stentgraft was Atrium V12 or covered CP-stent, iliac branches were constructed with Atrium V12 stents. Demographic data, procedure details and follow-up data were analyzed in a SPSS-database.
RESULTS: 22 patients were treated by CERAB with a median age of 57 years (48 – 90) and 59 % male. Median follow-up was 41 months (2 – 72) and mean admission time was 3 days. The indications were: PAOD 2 41%; PAOD 3 41%; PAOD 4 18%. TASC II classifications were: B 27%; C 23%, D 50%. 30 days mortality was 0%. In 3 cases procedure related complications were registered. Patency at 3 years: primary 82%, assisted primary 91% (2 patients underwent PTA of restenosis), secondary 100% (2 iliac stent occlusions, successfully treated by thrombolysis). Loss of primary patency was within the first year in all instances.
CONCLUSIONS: CERAB is a safe and good treatment option for complex TASC II lesions of the aorta-iliac segment: short hospital stays, low periprocedural morbidity and no mortality. The 3-year patency results are good, long-term follow-up results will follow. A 'endo first' strategy should be considered in these patients.

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Single-center experience of first-line approach with drug-eluting balloon in the treatment of femoro-popliteal occlusive disease

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BACKGROUND: The first line option treatment for peripheral artery disease (PAD) involving the femoro-popliteal district is the endovascular approach. One of the main concerns is related to the device selection for such treatments including standard angioplasty, stenting or drug-eluting

balloon (DEB). Herein we report our experience in the management of femoro-popliteal lesions using last-generation DEB as first choice.
METHODS: Retrospective analysis from February 2017 to February 2018 of patients presenting femoro-popliteal PAD. Were included patients treated with DEB as first choice treatment. Primary stenting or standard angioplasty were excluded from the study. Patients presenting infra-popliteal PAD were excluded from the study. Outcome measured were perioperative mortality and morbidity. Freedom from occlusion and secondary patency were registered. Addition maneuvers including stenting or angioplasty were reported.
RESULTS: A total of 90 (13 female and 67 male) patients with a mean age of 72 years were included in the study. A Rutherford III, IV, V and VI class was reported in 23, 30, 27 and 10 patients respectively.
No perioperative mortality was reported. Morbidity occurred in 4 (4,4%) cases for diagnosis of pseudoaneurysm. Additional stenting was required in 29 (32%) patients. Indication was a residual stenosis in 18 cases and arterial dissection in 11. Standard stents or drug-leuting stents were employed in 20 and 9 cases respectively. The mean follow-up was 12 months. At 1 year follow-up, estimated freedom from occlusion and secondary patency was 90% and 95% respectively.
CONCLUSIONS: In our limited experience the use of DEB was safe and effective in addressing femoro-popliteal occlusive disease. It reduced the use of stents, limiting its use in subintimal recanalization or long (>20 cm) lesions. When stenting was additionally employed to DEB its uses was limited to short arterial segments.

Friday May 24, 2019
14:00 - 15:00

Cardiac Abstracts Session 6:
Aortic Dissection

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Hybrid frozen elephant trunk operation in acute aortic dissection with use of Thoraflex prosthesis

Paolo Masiello, Generoso Mastrogiovanni, Carmine Ruopolo, Oreste Presutto, Antonio Longobardi, Francesco Cafarelli, Mario Colombino, Donato Triggiani, Gerardo Del Negro, Rocco Leone, Felice Rosapepe, Severino Iesu

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BACKGROUND: Acute aortic dissection is still a catastrophic event with high mortality and morbidity. Long term surgical results often evidence the need for further interventions due to dissected arch or thoracic aorta dilatation. To obtain a single surgical stage resolution we perform a frozen elephant trunk (FET) using hybrid Thoraflex prosthesis in all acute type I dissection.
METHODS: All over 2018 twenty-five consecutive unselected case of acute aortic dissection underwent FET surgery using Thoraflex. Twenty-two were male. The mean age was 60 years-old. Diagnosis was made by AngioTC and TEE and surgery was performed within 36 hours from the symptoms. Cannulation of intrathoracic subclavian artery via side conduit was made to start ECC. Cerebral protection was obtained via selective cannulation of the remaining supra-aortic vessels. Mean cross clamp time was 119 minutes and circulatory arrest was 27 minutes. Three patients underwent root replacement with Bio Bentall operation and 7 underwent "Florida" sleeve operation. In 2 cases a CABG was performed and 2 aortic valve replacement were necessary.
RESULTS: 30-days mortality was 12% (3 patients). Two patients suffered from major cerebral damage (one preoperative stroke). Mean packed red blood cells transfused were 4,8 and in two cases reoperation for bleeding was necessary. Two acute kidney injury needed CVVH. All other patients were discharged from ICU after a mean time of 12 days and discharged home on 32th POD. No other major complications were reported. TEVAR was planned as a subsequent step where needed.
CONCLUSIONS: In our experience Thoraflex hybrid graft is easy to implant and associated with low mortality results and low rate of major complications. It allows a short circulatory arrest time, reduce malperfusion expanding the true lumen of descending aorta help to prevent future dilatation of the dissected thoracic aorta. In addiction it prepare to a TEVAR when needed.

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Arch replacement with one stage approach; 5-years follow-up with Frozen elephant trunk

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BACKGROUND: Aortic arch disease is one of the most challenging issues in cardiovascular surgery and surgical repair is often performed using an elephant trunk procedure. The aim of this study was to evaluate the outcome of our frozen elephant trunk (FET) experience and to present the 5-year results.
METHODS: Between July 2013 and January 2019, 31 consecutive patients underwent total aortic arch replacement with FET technique. We used solely the Vascutek Thoraflex prostheses. Concomitant procedures included aortic valve-sparing operations (Lansac, N.=1) and aortic root replacement (Bentall, N.=14). Last available computer tomography (CT) and patients data were retrospectively analyzed.
RESULTS: The mean age was 67.2 ± 9.3 years old, 52 % of the patients were male. Atherosclerotic aneurysm was the indication for surgery in 68 %, acute Type A aortic dissection accounted for 23 % for FET patients. The remaining 9% of the patients were operated for chronic Type A or chronic Type B dissections with arch involvement or re-operation involving pseudo-aneurysm formation.
In-hospital mortality was 19 % for all FET patients. Acute type A aortic dissection are responsible for 50 % of the in-hospital mortality. The mean follow-up was 2.5 years (range 0-5.5 years). Incidence of stroke, acute renal failure requiring temporary ultrafiltration, spinal cord injury and bowel ischemia were 10, 16, 6 and 3 % respectively. Six patients (19,4%) required endovascular completion in their follow-up. One patient underwent open distal aortic operation. Three patients (9,7 %) received as a 'one stage procedure' immediately endovascular completion. One patient (3 %) developed a pseudo-aneurysm 6 months after FET procedure. Freedom from reoperation on the FET was 100 %
CONCLUSIONS: The frozen elephant technique offers a curative single-stage procedure with satisfactory mid-term outcome. It gives good landing options for future endovascular treatments.

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Early results of open aortic arch surgery with anterograde cerebral perfusion

An Nguyen

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BACKGROUND: Aortic arch operations are complex. There are several ways to protect the brain. We do aortic arch operations with anterograde cerebral perfusion. We estimate the early results.

METHODS: We retrospective studied 58 aortic arch replacement patients from Jan 2016 to Feb 2018.
RESULTS: Male to female ratio was 41:17, average age was 56.1±11.7 years old. Fifty-three patients (91.4 %) were operated emergently or urgently. Type A dissection was in 43 patients Hemiarch replacement was 26 cases (44.8%, total arch replacement was 32 cases (55.2%). Mortality is 8.6%. Permanent stroke was 3.8%.
CONCLUSIONS: Aortic arch replacement with anterograde cerebral perfusion is effective and safe.
KEY WORDS: aortic dissection, aortic aneurysm, anterograde cerebral perfusion.

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Ascending aortic elongation and longitudinal strain; a comparison between ascending aortic aneurysms and healthy aortas

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BACKGROUND: Ascending aortic elongation is less studied, although the surgical observation reveals that the aorta is more elongated in aneursym patients. The aim of this study is to describe the normal ascending aorta length, explore the relationship between the elongation and dilatation, the consequent change of curvature of the ascending aorta and the change in angulation of the aorta-ventricular septum. Furthermore, we studied if the elongation is associated with decreased longitudinal strain.
METHODS: A non-interventional retrospective design study of ECG-gated CT-scans of aneurysm patients (N.=101) compared with healthy controls (N.=83) was performed. The aneurysm patients were divided in three subgroups; aortic root dilatation (subgroup 1), tubular dilatation (subgroup 2), and aortic root and tubular dilatation (subgroup 3). Using a self-developed measurement method, the diameters, lengths and angles of the ascending aorta were measured using commercially available 3Mensio-software.
RESULTS: Median ascending aortic length of subgroup 3 (112mm) and subgroup 2 (100.3mm) were significantly higher compared to subgroup 1 (95.3mm) and the control group (87.7mm). Elongation mainly takes place at the outer curvature of the ascending aorta, and is associated with an increased angulation of the ascending aorta and a more curved ascending aorta. A significant decrease of longitudinal strain was found in the aneurysm group (1.88%) compared to the controls (2.96%).
CONCLUSIONS: Aortic elongation and decreased longitudinal strain were demonstrated in patients with ascending aortic aneurysms. Furthermore, we found a strong correlation between dilation and elongation. The systematic measurement of aortic elongation and longitudinal strain as a marker of increased risk for aortic dissection remains to be determined through a large scale longitudinal pre-dissection follow-up.

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Is Type I hybrid surgery a good choice for patients with acute non-A-non-B aortic dissection?

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BACKGROUND: To describe and investigate time-dependent changes in aortic morphology and hemodynamics in less elderly patients with acute non-A-non-B dissection after type I hybrid arch repair.
METHODS: Between January 2017 and January 2018, data from 316 patients with aortic dissection were reviewed from a prospective database. Patients (age < 65 years old) with acute non-A-non-B aortic dissection (arch-entry with antegrade or descending-entry with retrograde dissection) undergoing type I hybrid surgery were enrolled. Preoperative and follow-up CT angiography (7 days, 1 month and 12 months postoperatively) were recorded and analyzed by using computational fluid dynamics (CFD) simulations. A series of morphologic and hemodynamic parameters of the aorta were derived and evaluated.
RESULTS: Ten patients (mean age 52.5±4.8 years) were treated with arch vessels debranching combined with aortic stents implantation. Primary technique success was 100%, and 1 retrograde aortic dissection was observed during 12-month follow-up. Among morphological parameters, significant elongation of the native ascending aorta (10.0±13.7 *vs.* 16.2±17.3, P=0.02) and softening of the arch curvature (aortic arch angle 86.3±7.0 › *vs.* 99.5±11.5 ›, P=0.04) from 7 days to 1 year after surgery were observed. In terms of the changes in hemodynamics, the pressure in the aortic arch gradually decreased and the maximum time-averaged wall shear stress in the distal abdominal aorta decreased from 119.2 dyne/cm2*t to 57.4 dyne/cm2*t after surgery.
CONCLUSIONS: Type I hybrid arch repair for less elderly patients with acute non-A-non-B aortic dissection seems to offer optimal short-term outcomes and, from a hemodynamic point of view, can provide improved antegrade blood flow to vital organs. However, the unfavorable changes in the ascending aorta and arch may yield a high risk of complications in proximal landing zones. CFD simulations have provided additional evidence that may help to assess and predict hemodynamic-related aortic remodeling after surgery.

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Late reoperations after acute Debackey TYPE I aortic dissection according to primary surgical strategy

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BACKGROUND: Late aortic complications can develop after repair of acute DeBackey Type-I aortic dissection (AD) but whether a more extensive surgery prevents from future reoperations remains controversial. The aim of this study is to analyse causes, timing and results of reinterventions after primary repair for AD.
METHODS: From 1977 to 2018, 283 patients were discharged after AD surgery: 33 (mean age 60-years, Group-1) of the 226 patients who underwent ascending aorta replacement and 8 (mean age 64-years, Group-2) of the 57 patients who received total arch surgery needed an additional procedure.
RESULTS: Redo surgery was more common in Group-1 (30 *vs.* 3 patients, P<0.001) while endovascular treatment (TEVAR) in Group-2 (1 *vs.* 7 patients, P<0.001). Indications for surgical reoperation were pseudoaneurysm at graft anastomoses (18 pts, 60%, 3 with aortic insufficiency) and progression of distal aortic dissection (12 pts, 40%) in Group-1, one pseudoaneurysm at the proximal graft anastomosis in Group-2. Arch replacement was performed in 14 patients and root surgery in 11 patients, other procedures in 5 patients of Group-1; root replacement in one patient of Group-2. Indication for TEVAR was progression of distal aortic dissection in 2 patients of Group-1 and in 7 of Group-2. Median follow-up after reoperation was 2.4 years (5-years in Group-1 *vs.* 0.28-years in Group-2; P=0.002). Additional second redo surgery was

required in 4 patients from Group-1 (12%) during a median follow-up of 4 years. In-hospital mortality was 9.1% in Group-1 and 0% in Group-2 (P=0.5). One- and 5-year overall-survival was 83% and 74%, respectively, for Group-1 and 100% for Group-2 (P=0.13).
CONCLUSIONS: Complex reoperations after AD surgery are associated with acceptable mortality. However, a more extensive repair results in lower rate of reoperation and in better mid-term survival. These data support a more aggressive initial strategy in referral centers especially for younger patients.

Friday May 24, 2019
15:00 - 16:00

Cardiac Abstracts Session 7:
Mini-Avr & Sutureless

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Precise moulded autologous pericardial configurations for aortic cusp reconstruction

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BACKGROUND: In order to facilitate surgical repair of complex aortic cusp deformities and restoration of aortic valve competence, new moulds were developed to shape the glutaraldehyde-treated autologous pericardium into precise cusp-like configurations that can be used in aortic cusp reconstruction.
METHODS: The new moulds embodied the natural geometry of single aortic cusps, and a series of moulds were made available to correspond with all potential aortic cusp sizes. Aortic valve reconstruction using moulded utologous pericardial cusps was performed in 2 patients (both males, aged 14 and 19 years) with large outlet-type ventricular septal defects, extensive deformation of prolapsed right coronary cusps and severe aortic valve insufficiency. In each patient, the diseased right aortic cusp was excised, and was replaced by a moulded autologous pericardial cusp that equalled the size of adjacent undiseased native cusps.
RESULTS: Excellent coaptation with adjoining native aortic cusps could be readily observed, and intraoperative transesophageal echocardiography confirmed satisfactory aortic valve repair (aortic insufficiency <1+ and low transvalvular gradients). Follow-up transthoracic echocardiography confirmed that aortic valve function remained stable in both patients 2 years postoperatively.
CONCLUSIONS: Initial clinical experience indicated that constructing geometrically perfect cusp-like configurations was uncomplicated, and implantation of the moulded autologous pericardial cusps restored adequate aortic valve competence. We believe that the simplicity and reproducibility of this approach may assist in the dissemination of aortic cusp reconstruction procedures.

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Health care changes associated with infective endocarditis in the current century in Spain

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BACKGROUND: Several epidemiological studies have been published on infective endocarditis (IE) worldwide but we have few information about the impact on the health care system. The aim of this study was to evaluate the evolution of the incidence, mortality, and hospital costs related to IE in Spain between 2000 and 2014.
METHODS: A retrospective study was performed of all patients admitted for IE in Spanish hospitals (public and private) between January 1st, 2000 and December 31st, 2014. Data were extracted from the Data Minimum Basic Data Set (MBDS) of the National Surveillance System for Hospital Data in Spain.
RESULTS: In total, 29,777 patients were diagnosed during this period. IE was more prevalent among males (66.99%). The mean age for the totality of patients included in the study was 61.83 years (SD 18.44). The adjusted incidence of IE (events per 100,000 population) rose from 3.22% in 2000 to 5.56% in 2014. The mean length of hospital stay (LOHS) decreased slightly over the periods analyzed. In 2000, the mean LOHS was 27.0 days *vs*. 26.17 in 2014. The total national cost (€ millions) for IE increased from 7223,42 in 2000 to 15,097.47 in 2014, peaking to 16,278.48 in 2011.
CONCLUSIONS: This is one of the largest epidemiological study performed on IE in Spain. The results obtained show an increase in the incidence and mortality in the last two decades, accompanied by a remarkable raise of hospital costs until the onset of the economic crisis. Since then, hospital costs have remained stable.

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Tricuspid insufficiency in aortic valve replacement, current state of surgical treatment

Juan B. Munguira[1], Pablo Alvarez[2], Bernat Romero[1], Cristian Munoz[1], Marisa Camara[1], Nuria Vallejo[3], Jorge Lopez-Ayerbe[3], Angels Figuerola-Tejerina[4]

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BACKGROUND: Aortic stenosis (AS) is one of the most prevalent valve diseases, rarely accompanied by tricuspid regurgitation (TR). Our objective was to analyze the frequency of presentation of TR, its impact on prognosis, and surgical treatment results.
METHODS: A retrospective cohort study (2001-2018) including all patients with AS presenting some degree of TR. The sample was divided into mild (non-significant) and moderate-severe (significant) TR groups. An echocardiogram was performed before surgery, postoperatively and during the follow-up.
RESULTS: There were 8,080 patients with AS, of which 143 presented TR. Of these, TR was significant in 35.7%. In this group, the frequency of women was greater (P=0.013), functional class advanced (P=0.028)

and EuroSCORE 1 greater (P=0.001). There were differences in tricuspid annular plane systolic excursion (P=0.007) and in left atrial diameter (P=0.001). Significant TR was associated with increased mortality regardless of sex (hazard ratio [HR] 2.14, 95% confidence interval [CI] 1.27 to 3.61), respiratory insufficiency (HR 3.68, 95% CI 2.06 to 6.57), liver failure (HR 8.0, 95% CI 2.95 to 21.68), kidney failure (HR 1.14, 95% CI 1.05 to 1.24), EuroSCORE (HR 1.02, 95% CI 1.00 to 1.03), left ventricle ejection fraction (HR 1.01, 95% CI 1.00 to 1.03 for ejection fraction <50%) and tricuspid annuloplasty [HR 4.006 (1.262-12.716); P=0.019]. Overall survival was similar in patients with significant TR and non-significant TR (log rank P=0.404), also if patients with tricuspid annuloplasty were excluded (log rank P=0.271).
CONCLUSIONS: The presence of TR is rare in patients with AS. The grade of severity of the TR is not associated with increased in-hospital mortality. Tricuspid annuloplasty did not reduce mortality. During follow-up the presence of TR behaved as a factor predicting poor evolution.

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The use of intraoperative epiaortic ultrasonography in patients over 75 treated with aortic valve replacement

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BACKGROUND: Epiaortic ultrasound scanning (EAS) extended the use of ultrasound to the intraoperative diagnosis of aortic pathology. Surgical palpation of the ascending aorta underestimates the presence and severity of atherosclerotic plaques. Epiaortic ultrasound scanning has been used as an adjunct to transesophageal echocardiography (TEE) or as a primary direct diagnostic tool for imaging the ascending aorta as well as the aortic arch, which gained prominence as part of a multipronged intraoperative strategy to reduce atherosclerotic emboli.
METHODS: The analyzed group consisted of 35 patients (mean age: 81.3 years) treated with aortic valve replacement (AVR), either alone (60%) or combined with coronary artery bypass grafting (CABG; 22.8%) or aortic aneurysm replacement (11.42%). In 2 patients, only CABG was performed because intraoperatively reevaluated strategy. Thierteen patients have got a history of diabetes, 10 chronic renal failure and 3 of cerebral stroke.
RESULTS: In more than 80% of patients, positive EAS results had an influence on the choice of aortic clamping site and in 50% of patients on the site of cannulation. Female sex, peripheral vascular disease, history of previous stroke, and calcifications in the ascending aorta in TTE have significant predictive value for recognizing atherosclerotic changes in EAS and the risk of postoperative neurological complications in octogenarians treated with AVR.
CONCLUSIONS: In order to sum up the results of the analyzed group of 35 patients, clinical and demographic data were collected and compared with the results of imaging examinations. Female sex, atherosclerotic lesions in carotid vessels, previous stroke, and calcifications of the ascending aorta visualized by preoperative transthoracic echocardiography proved to be parameters which, when diagnosed together, had a significant influence on confirming atherosclerotic changes with EAS and increased the risk of perioperative complications in patients over 75 years old undergoing AVR

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Less invasive aortic valve replacement using the Trifecta GT bioprosthesis

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BACKGROUND: The optimal bioprosthesis in minimally invasive aortic valve replacement (MiAVR) is debated. Sutureless valves have been proposed to optimize operative times and hemodynamics, yet they have specific shortcomings with respect to conventional sutured valves. We investigate the safety and effectiveness of the Trifecta GT sutured bioprosthesis in MiAVR.
METHODS**.** Retrospective review of Trifecta GT recipients by three MiAVR accesses (UMS, J-Upper ministernotomy; RMS, J-Reversed ministernotomy; RAMT, Right anterior minithoracotomy). In-hospital and follow-up data were collected, including early/late hemodynamic performance (PPM, Patient-prosthesis mismatch).
RESULTS: Among 97 patients, 78.3% received UMS, 13.4% RMS and 8.2% RAMT. Approach was decided by preoperative analysis (CT-scan). There was no operative mortality, no valve-related adverse events. Concomitant procedures occurred in 18.4% (ascending aortic replacement in 15 cases, 15.4% - septal myectomy in 3, 3.1%). Average cardiopulmonary bypass time in the UMS, RMS and RAMT subgroup was 102±21, 111±26 and 113±14 minutes, respectively (P=0.18). Average aortic clamp time was 74±18, 84±19 and 77±14 minutes, respectively (P=0.19). No significant intergroup differences occurred in mechanical ventilation time, ICU stay or average bleeding. Overall, mechanical ventilation and ICU stay were 6.8±2.5 and 47±16 hours, respectively. There was one (1%) of permanent pacemaker implantation, and no significant (≥2+) aortic regurgitation at discharge. There was one moderate PPM (1%) and no severe PPM; there was no significant (≥2/4) perivalvular leak. iEOA at discharge was 1.3 ± 0.1 cm^2/m^2. At follow-up (12.6 ± 7.3 months, 100% complete) there were neither mortality nor valve-related adverse event. Hemodynamic performance was maintained at follow-up.
CONCLUSIONS: The optimal device for MiAVR needs to be individualized, as well as the selection of surgical approach. The Trifecta GT appears safe and reproductible in this context, with excellent hemodynamic performance. Current results of MiAVR using stented bioprostheses need to be considered in decision-making *vs.* transcatheter aortic valve implantation (TAVI).

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Clinical and hemodynamic outcome of patients receiving Perceval S sutureless valves in 5 years observation

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BACKGROUND: The aim of the study was to analyze the 5 years term hemodynamic and clinical parameters of the sutureless Perceval S valves implanted in Silesian Center For Heart Diseases.
METHODS: 32 Perceval S sutureless bioprosthetic valves were successfully implanted between year 2010 and 2013 (16 valves size 23, 14 size

25, and two size 21). The mean diameter of the native aortic annulus in TEE was 21.9 mm and the mean size of implanted valves 23.9. Fiveteen implantations were made by minithoracotomy. In postoperative period 75% of patients changed their NYHA class from III or II to I with evident improvement of exercise capacity
RESULTS: The mean transvalvular gradient changed significantly from 54.5 mmHg to 13,3 post operation and 14 mmHg in 5 years follow-up. Mean ejection fraction (EF = 53,5%) not changed in follow-up The value of mean effective orifice area (EOA) in follow-up echocardiography was 1.61 cm2. The mean extracorporeal circulation time was 78,6 and implantation time 10,1minutes. There was no significant difference in count of drainage and time of hospitalisation, with evident shorter rehabilitation of ministernotomy group. We noticed one in-hospital dead due to cardiac tamponade. 22 patients end 5 year follow- up 2 patients were reoperated: 1 because of aortic aneurysm and another with valve restenosis in 7years post Perceval implntation. In long term observation died 7 patients: 3 with diagnosed cancer (2 lungs and 1 liver), 2 because of sudden cardiac death, without autopsy and 2 due to stroke.
CONCLUSIONS: Implantation of a sutureless valves seems to be the right choice, especially from a miniinvasive approach. Sutureless self-expandable Perceval S valves is promising future option for older patients with lower than TAVI logistic score and small aortic annulus. In our observation the 5 years mortality was mainly concerned to age-related diseases not to valve dysfunction.

Saturday May 25, 2019
08:00 - 09:30

Vascular Abstracts Session 8:
Peripheral Arterial Occlusive Disease (PAOD)

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Results of operational interventions in the aorto-subject segment

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BACKGROUND: To evaluate the results of various methods of revascularization in atherosclerotic lesions of the aorto-iliac segment.
METHODS: 192 patients with atherosclerotic lesions of the aorto-iliac-femoral segment, who underwent reconstructive surgery, were examined. According to the type of revascularization performed, the patients were divided into 3 groups: 85 patients of the first group underwent open surgery (PA); endovasal interventions (EV) were performed in patients of the second group (63 patients); Patients included in group 3 (44 people) were treated with hybrid surgical interventions. In the analyzed observations, the duration of surgery, blood loss, bed-day and duration of stay in the intensive care unit, deviations of blood pressure and blood glucose, as well as the primary patency of the operated segment, the frequency of complications, the need for repeated reconstructions in the early postoperative period were recorded.
RESULTS: Critical ischemia and the type of C/D lesion according to the TASC II classification are more frequently observed in the hybrid intervention group (P<0.05). 222.36±66.07min, GV-149.67±51.25min) and endovasal (EV-108.19±49.37min, GV-77.58±27,79min) of the stage (P<0.05). Endovasal surgical interventions were characterized by minimal blood loss and a short period of stay in the intensive care unit (P<0.05), however, they were characterized by a significant incidence of postoperative complications, the development of which often required repeated, often open surgical interventions (P<0.05). Open surgical interventions were characterized by good results in the early stages (P<0.05). Hybrid interventions differed less blood loss compared with open methods (P=0.001). Hybrid operations have shown good results in the early stages: a slight incidence of serious complications, such as infection of the surgical area, thrombosis of the operated segment, bleeding, a small need for repeated surgical intervention and the absence of amputations (P<0.05).
CONCLUSIONS: Hybrid interventions demonstrated acceptable results in the early stages of revascularization of the aorto-iliac segment.

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The role of female gender on outcomes of stenting for aorto-iliac arterial obstructive disease

Francesco Squizzato, Michele Piazza, Mirko Menegolo, Carlo Maturi, Chiara Chincarini, Silvia Bassini, Franco Grego, Michele Antonello
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BACKGROUND: The aim was to evaluate outcomes of stenting for aorto-iliac obstructive disease in female (F) patients comparing their results with males (M).
METHODS: A single-center retrospective review of iliac stenting procedures performed from 2008 to 2017 was conducted. Preoperative clinical and anatomical data, including mean arterial diameters, were prospectively collected. Early and long-term outcomes were compared between males and females. Follow-up results were analyzed with Kaplan-Meier curves; Cox proportional hazards were used to identify independent predictors of patency.
RESULTS: 210 patients, accounting for 298 limbs (F: N.=80, 33%; M: N.=218, 66%), were treated. Comparing females to males, there were no differences regarding comorbidities (SVS score: F: 0.81±0.54; M: 0.84±0.60; P=.69) and TASC classification (P=.49). Females had more advanced symptoms at presentation (Rutherford 5/6 categories: F: 36.2%, M: 23.8%; P=.039) and smaller arterial diameter at the level of target iliac artery (F: 8.7±1.5 mm; M: 10.1±2.6 mm; P=.006); similarly the mean stent's diameter was lesser (F: 8.9±1.7 mm, M: 10.1±4.4 mm; P=.03). In-hospital medical (P=.22) and surgical (P=.50) complication rates were similar. At 72 months, females had lower primary (F: 68%, M: 86%; P=.014) and secondary patency (F: 81%, M: 95%; P=.004) compared to males, while limb salvage was similar (F: 95%, M: 99%; P=.601). Multivariate analysis indicated that female gender (HR 2.22; P=.04) and stent diameter <8mm (HR=2.46; P=.03) were overall negative predictors of patency. Within females, external iliac artery involvement (HR=2.99; P=.04) and stent diameter <8mm (HR=3.45; P=.04) were negative predictors.
CONCLUSIONS: Iliac stenting shows similar early outcomes between females and males. However during long-term, primary and secondary patency rates are significantly lower in women, and this may be explained by smaller arterial diameter; in particular, a stent diameter <8mm and external iliac stenting were negative predictors of patency.

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Experience of hybrid revascularizations over a period of 2 years at the centre for cardiovascular surgery in Vienna

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BACKGROUND:The majority of our vascular surgery patients benefit from the rising endovascular procedures performed in local anaesthesia

for treatment of aortic/aortoiliac or peripheral vascular diseases avoiding burdensome operations. An increasing number of multimorbid patients with critical limb ischemia need an complex (re-)operation. We argue that for this patient group, a single-stage hybrid operation, carried out interdisciplinary or by a team of vascular surgeons skilled in vascular and endovascular operative techniques would be the best option.
METHODS: 54 consecutively performed hybrid vascular operations over a period of two years at the Centre of Cardiovascular Surgery Vienna in Austria were evaluated. 29 (54%) were performed at the radiological angiosuite, whenever surgical exposition of the common femoral artery or the subclavian artery was necessary. In the angiosuite 8 thoracic EVARs, 20 abdominoiliacal EVARs and 1 angioplasty with stenting iliacal were conducted. In the operating room 25 (46%) hybrid operations with 17 revascularization of the iliac arteries, 6 infra- and supragenual revascularizations and 1 conclusion angiography were performed in line with vascular reconstruction of the groin arteries. Further 1 arterial port was implanted in the groin with embolisation of the gastroduodenal and gastric artery. Additional from these scheduled operations, 7 emergency surgical operations were necessary after failed interventions.
RESULTS: Our study indicates that different technical approaches can successfully be applied in one session for treatment of patients with multilevel arterial occlusive disease both in urgent planned cases and in vascular emergencies. These polymorbid patients clearly benefit from reduced physical stress by avoiding multiple operations and/or interventions, resulting in substantially shorter hospitalisation.
CONCLUSIONS: According to common international practice the endovascular specialisation of the vascular surgeons in Austria has to be broadly implemented and pushed forward for the advantage of our patients and society.

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Occluded superficial femoral artery used for emergency reconstruction: A case series about the ‘proper conduit technique’

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BACKGROUND: A commonly feared complication after open revascularization of the Femoral artery is a deep wound infection in the groin region. This infection can result in an acute or life threatening condition. It can be difficult to provide a reconstruction when the venous system has been used for earlier bypasses. Reconstruction with a synthetic prosthesis is frequently not possible as ‘first-choice-technique’ because of the contaminated operation field or when anticipating on infection of the wound in the groin. It was ad hoc hypothesized, in an acute setting with the expected surgical site infection, to use a segment of the occluded Superficial Femoral Artery (SFA) in combination with the eversion technique, which is commonly known in carotid surgery.
METHODS: This study was conducted and reported in line with the consensus-based clinical case report guideline (CARE, 2016). Data of seven patients were retrieved from the electronic patient files and were analyzed retrospectively. A duplex ultrasound was performed to evaluate the patency of the conduits of all patients.
RESULTS: Seven patients with a history of vascular disease underwent an open revascularization for which an occluded SFA segment was harvested. An eversion endarterectomy of the selected SFA segment was performed, it was used as a ‘proper conduit’ to restore the blood flow to the limb. Postoperatively, best medical treatment (antiplatelet medication and statins) was (re)started and no major complications were assessed. All groin wounds healed completely. To date, all conduits showed patency with a follow-up period of at least 6 months.
CONCLUSIONS: The ‘proper conduit technique’ of an occluded SFA segment seems to be a feasible method for emergency and elective treatment of vascular patients with (potential) groin region difficulties and risks for infection (Level-of-Evidence 4). Long term follow-up is needed to assess whether or not the promising patency stands the test of time.

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Single center experience of subintimal recanalisation for Femoropopliteal TASC II C-D lesions using Mimetic stents

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Vascular and Endovascular Surgery of Trento, Trento, Italy

BACKGROUND: According to the TransAtlantic Inter-Society Consensus (TASC II), surgical treatment is indicated for femoropopliteal D lesions. The recent development of subintimal recanalisation and the introduction of nitinol flexible stents has improved endovascular treatment of high surgical risk patients.
This retrospective single center study describes our short-term experience regarding the subintimal recanalisation with the Supera stent.
METHODS: 79 patients (82 limbs from 2015 to 2018) who underwent subintimal recanalisation and Supera stent deployment for TASC II C-D femoro-popliteal lesions were retrospectively evaluated. Primary Patency (PP)and secondary patency (SP) were assessed using Kaplan Meyer analysis.
RESULTS: 70% were male. Mean age was 78 years old. Majority of them had critical limb ischaemia (53,8%, 20,5% of cases corresponding to Rutherford categories 5-6 and 4, respectively). 96,3% were TASC IID femoropopliteal occlusions, mean length 233 mm. The mean number of stent used was 1,4 per patient. In 92% of cases an orthograde approach was used. Of the 82 procedures,50 (60,95%) underwent a concomitant treatment of tibial vessels, with successful recanalisation of 3 vessels in 31.7% of cases, 2 in half of them and 1 vessel in 15.9%. Technical success was achieved in 97,4% of procedures. 48 patients reached 12 months, 18 concluded 24 months of observation. Primary patency at 6, 12, 18 and 24 months was 86%, 67%, 63% and 60% respectively. Major amputation occurred in 3 patients (3,6%). SP rate was 91% at 6 months and remained stable at 82% at each clinical and ultrasound evaluation performed at 12, 18 and 24 months. All patients reached Rutherford category 1.
CONCLUSIONS: Our preliminary results in case of TASC II C-D femoropopliteal lesions in patients at high surgical risk validate our technique of subintimal recanalisation with Supera deployment as safe and effective.

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Management of late presenting extremity vascular injuries at Jipmer - Tertiary Care Centre in India

Kadaba Sreevathsa, Soman Jeyakrishnan, Munuswamy Hemachandren, Padmanabhan Ramshankar, Rath Durgaprasad, B.V. Saichandran

Jipmer, Pondicherry, India

BACKGROUND: Late presenting vascular injuries is a challenge for the treating surgeon. Although the management of vascular injury have been reported many times in both civilian and warfront population, the experience of managing late presenting vascular injuries are seldom described.

This study reports the surgical management of traumatic extremity vascular injury, which presented late to the emergency room at JIPMER, a tertiary care centre in India.
METHODS: From July 1, 2016, to Dec 30, 2018, 65 late presenting extremity vascular injuries – presenting beyond 8 hours of injury and treated in Emergency Operation theatre in JIPMER, Puducherry, were retrospectively reviewed.
RESULTS: All the 65 cases mentioned here presented beyond the golden period of 8 hours to emergency department, few of which were more than 24 hrs late. Surgical management included embolectomy alone in 24 cases, embolectomy with end to end vascular anastomosis in 19 cases or with interposition graft in 22 cases. Limb salvage was possible in 56 out of 65 cases. Major complications in extremity vascular patients, including limb loss and mortality, were present in 8 cases. Surgical wound infection occurred in 7 and graft thrombosis and redo surgeries 8.
CONCLUSIONS: This study is an extremity vascular injury management report in JIPMER, especially those presenting late.This is a Retrospective review and hence, patients not operated or directly sent for amputation are not mentioned in the total cases. Only patients operated are included. Late complications or follow-up is not reviewed.These cases present with challenges like timely decision making and multidisciplinary approach. We could conclude that revascularization beyond the golden hour is still feasible, thus preventing limb loss with acceptable rates of wound infection, restoring limb function and mortality. The management can be resource intensive and case to case decision making plays a key role for management.

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Midterm outcomes of drug coated balloon angioplasty in femoropopliteal arteries in daily practice

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Jeroen Bosch Ziekenhuis, 'S-Hertogenbosch, Netherlands

BACKGROUND: To evaluate the midterm outcomes in daily practice of drug coated balloon (DCB) angioplasty in femoropopliteal artery disease and to identify risk factors for restenosis.
METHODS: All patients treated with DCB angioplasty (IN.PACT Admiral, Medtronic) between January 2015 and September 2016 were retrospectively identified from a prospective held single-centre database. No exclusion criteria were applied. The primary endpoint was primary patency. Secondary endpoints were primary assisted patency, secondary patency, clinically driven target lesion revascularization (CD-TLR) and major adverse events. All endpoints were calculated with the Kaplan-Meier analysis. The Univariable and Multivariable Cox regression analyses were performed to identify risk factors for restenosis.
RESULTS: A total of 109 patients (113 legs) were included (45.1% male, mean age 72.2 ± 10.2). The rate of critical limb ischemia was 52.2% and total occlusions were treated in 38.1%. Primary patency rates were 87.3%, 78.6% and 60.6% at 1, 2 and 3 years, respectively. Primary assisted patency and secondary patency rates were 95.2% and 99.1%; 89.2% and 96.6%, and 79.2% and 90.6% at 1, 2 and 3 years, respectively. The CD-TLR was 6.9%, 14.3% and 20.6% at 1, 2 and 3 years, respectively. Overall mortality and major target limb amputation were 18.3% and 5.3% at 3 years. Multivariable analysis demonstrated that only TASC D lesions were associated with restenosis (P=.008).
CONCLUSIONS: DCB angioplasty is an effective and safe treatment option for femoropopliteal lesions in daily practice with excellent 1- and 2-year results. The 3-year results were slightly less favourable, which may indicate a late "catch-up" phenomenon. Only TASC D lesions were associated with loss of primary patency after adjustment for confounders.

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Effects of supervised exercise therapy on modifiable cardiovascular risk factors in intermittent claudication - meta-analysis

Sandra Jansen[1], Beatrijs Hoorweg[1], Sanne Hoeks[2], Marijn van den Houten[1], Marc Scheltinga[3], Joep Teijink[1], Ellen Rouwet[2]

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BACKGROUND: Cardiovascular risk reduction is a vital element of treatment in patients with intermittent claudication (IC). The objective of this study is to determine the effects of supervised exercise therapy (SET) on modifiable cardiovascular risk factors in IC patients.
METHODS: This is a systematic review and meta-analysis of prospective studies on the effects of SET on cardiovascular risk factors in symptomatic IC patients. Studies were eligible if they presented baseline and follow-up values for at least one of the following risk factors: blood pressure (systolic or diastolic), heart rate, lipid profile (total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol), glucose, HbA1c, body weight, BMI, or cigarette smoking. Pooled mean differences between follow-up and baseline were analysed using a random-effects model. Data were classified into short term results (6 weeks to 3 months) and mid-term results (6 to 12 months). Statistical heterogeneity was presented as I^2 and Q-statistic.
RESULTS: Twenty-seven studies with a total of 808 patients were included in this review. In the short term, SET resulted in significant improvements of systolic blood pressure (decrease of 4 mmHg, 10 studies, 95% confidence interval [-6.40 to -1.76], I^2 0%) and diastolic blood pressure (decrease of 2 mmHg, 8 studies, [-3.64 to -0.22], I^2 35%). In the mid-term, SET contributed to significant lowering of levels of LDL-cholesterol (decrease of 0.2 mmol/L, 4 studies, [-0.30 to -0.12], I^2 29%) and total cholesterol (decrease of 0.2 mmol/L, 4 studies, [-0.38 to -0.10], I^2 36%).
CONCLUSIONS: This study shows favourable effects of SET on blood pressure and cholesterol levels. Despite moderate quality, small trial sample sizes, and heterogeneity, these findings support the prescription of SET programs not only to increase walking distances, but also for risk factor modification. Future studies should address the potential effectiveness of SET to promote healthier lifestyle and improve cardiovascular outcomes in IC patients.

Saturday May 25, 2019
08:00 - 09:30

Cardiac Abstracts Session 8: Congenital Cardiac Surgery

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Relevance of social determinants for diagnosis and treatment of congenital cardiac anomalies in South America

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BACKGROUND: Congenital heart disease (CHD) continues to be the most common cause of major cardiac disease in infancy and childhood. Cardiac defects may be life-threatening and may curtail life expectancy

if anomalies are not monitored and corrective surgical procedures are not performed when deemed necessary. Marginal habitus and limitations in access and utilization of health care remain a challenge in South America.
METHODS: We examined the relationship between individual level social health determinants and the time lapse between date of first cardiac lesion diagnosis and date of surgical intervention in three South American countries – Ecuador Peru and Brazil.
We conducted a retrospective review of selected indicators of social determinants of health – parental employment status, parental health status, household crowding, age and gender – and assessed their impact on the time lapse between the date of diagnosis and the date of corrective surgical intervention.
RESULTS: The mean age (in years) of pediatric patients was 5.26± 5.39. 56.9% of patients experienced a time lapse of longer than 12 months between date of cardiac lesion diagnosis and date of corrective procedure. This proportion increased to 88% when the window was reduced to 3 months between diagnosis and intervention. Pearson's Chi-square test was used for statistical analysis with statistical significance at p value < 0.05 with 95% CI. Poor parental health ($P<0.05$), household crowding ($P<0.05$) and parental unemployment ($P<0.05$) were associated with an increased time lapse between date of diagnosis and date of surgical intervention for congenital cardiac anomalies.
CONCLUSIONS: This retrospective review suggests that low socioeconomic status at the individual level is associated with delays in accessing appropriate care for congenital cardiac diseases requiring surgical correction. Improved rural clinic screening and earlier referral for specialist evaluation may contribute to an increased awareness of those patients at risk of being overlooked.

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Duct dependent cyanotic neonates with PDA pose a unique challenge on next stage surgical intervention

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BACKGROUND: Duct dependent Cyanotic neonates are offered PDA stenting in our center. 18 babies have undergone one or more surgical procedures. We assessed the pulmonary arteries indexed growth and requirement of further pulmonary arteries rehabilitation in this subset.
METHODS: From January 2014 to December 2018 thirty consecutive neonates with cyanotic congenital heart disease had PDA stenting as initial palliation. Eighty percent were ventilated prior to the procedure. Procedural success was 100 %. Survival to discharge was 96 %. All patients were followed up prospectively. 18 patients of this group have undergone further surgical procedures
RESULTS: 90 % of the neonates had origin stenosis of one of the branch pulmonary arteries before PDA stenting. The indexed branch Pulmonary artery size was significantly smaller which grew after stenting the PDA. At the time of surgical procedure (Glenn etc.) Stent division/ ligation required additional PA plasty in 90 % of the cases. The pulmonary arteries in the midterm follow-up needed further rehabilitation by stent placement in two third cases.
CONCLUSIONS: PDA stent provide excellent palliation in cyanotic neonates. Despite an origin stenosis, the stent allowed growth in the size of both pulmonary arteries. However, majority required surgical augmentation and further stenting of pulmonary arteries in the midterm. Vigilant monitoring of pulmonary artery size is required during follow-up imaging of these babies. Stents in PDA may cause pulmonary arteries fibrosis and narrowing.

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Safety of patent ductus arteriosus closure with video-assisted thoracoscopic clipping in preterm infants

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BACKGROUND: Patent ductus arteriosus (PDA) is a congenital heart defect, that occurs commonly in preterm infants. The conservative or pharmacological treatment are the basic strategy. However, if they fail or are contraindicated and percutaneous approach is impossible, then surgery remains the only solution. Due to the minimally invasive characteristics, video-assisted thoracoscopic surgery (VATS) is the preferred technique. The goal of this study is to evaluate the results of VATS clipping of PDA in preterm infants.
METHODS: Outcomes of consecutive 49 preterm infants (mean gestational age 26.9±3.0weeks) with a mean age at the surgery of 30.4±14.2days and weight of 1346.4±670.8grams were analyzed. All children underwent between February 2012 and May 2018 VATS closure of PDA due to hemodynamically significant duct with mean diameter of 3.9±1.3mm, ratio of the left atrium to the aorta ≥1.5 and presence of left-to-right shunt. The complete follow-up lasting 4.7±1.7years was performed.
RESULTS: Operative mortality was zero. The mean procedure time was 46.6min (15-135min). Emergency conversion to thoracotomy was necessary in 7 (14.3%) patients. One patient required late conversion due to lung injury. Chest tube insertion was needed in 5 patients with pneumothorax (N.=4) and chylothorax (N.=1). The 30-day and in-hospital mortality rates were 12.2%. The main cause of deaths was cardiopulmonary failure (N.=4) and all these infants required preoperative inotropes with mechanical ventilation. Other two patients died due to cerebral disorders and both of them had preoperative intraventricular hemorrhage. Two patients were discharged home 3 and 4 days after the surgery, whereas rest of the patients required further treatment on neonatal intensive care unit with mean hospital stay 8.3±4.5weeks due to their prematurity. One- and five-year probability of survival were 83.6% respectively.
CONCLUSIONS: VATS closure of PDA is safe and effective in preterm infants. The high postoperative mortality and prolonged hospital stay depends on the prematurity.

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Single center experience of percutaneous Ventricular Septal Defect (VSD)

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BACKGROUND: Since Lock reported his first attempt of VSD closure with Rashkind device the enthusiasm about percutaneous VSD closure keep growing and the most experienced in the world to now is chenese people who performed almost 3000 procedures. This study was designed to share our experience of percutaneous VSD closure (including perimembranous pmVSD) with variety of devices.
METHODS: 97 patients with the mean age 13.81 ± 15.59 yr were included in the study in between January 2012 and January 2019. 94 pts

(96.9%) had congenital VSD, 2 pts (2.1%) residual shunt after surgery, 1 pt (1.0%) posttrauma VSD. 26 pts (28.8%)had muscular VSD and 71 pts (73.19) had pmVSD. 8 pts had hybrid perventricular VSD closure, 89 pts had percutaneous closure.
RESULTS: 57 different type of occluders were implanted to 56 pts, 26 of them were used for muscular defects and 30– for pmVSDs. 39 Nit-Occlud le VSD coils and 1 Nit-Occlud PDA coil were utilized in 39 pmVSDs. The procedure was successful in 91 pts (93.8%). Mean fluoro time – 22.9±30.9 (from 9 to 118) min. Mean procedure time 125,0±55,5 (from 30 to 340) min. 10 pts (10,3%) experienced complications. 3 (3%) of them had major complication and 7 (7.2%) minor.The complete closure rate was 67%, 92.8% and 97% following 24 hr, 6 month and one year after procedure. Mean follow-up was 28.6±19.3 months. No incidence of A-V block, new onset of valvar regurgitation were recorded.
CONCLUSIONS: Percutaneous VSD closure is safe and effective alternative to open heart surgery. Creativity and cool head are necessary for proper patient and device selection in [...]

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Different left ventricular remodeling between descending thoracic and ascending aorta banding in porcine model

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BACKGROUND: There are differences in the timing of peak left ventricular (LV) afterload (early *vs.* late) in arterial hypertension. However, chronic effects of different timing in LV afterload on LV remodeling and functional state remain unknown. Therefore we aimed to compare differences in LV functional and structural remodeling between chronic late *vs.* early LV systolic loading, after 8 weeks of thoracic aorta banding in the porcine heart, using cMRI and invasive measurements
METHODS: Pigs (N.=14, 28±4 kg) randomly underwent either ascending or descending thoracic aorta banding. Chronic late LV systolic loading resulted from descending thoracic aorta banding (DB N.=8). Ascending aorta banding (PB N.=6) induced chronic early systolic loading. cMRI was performed on baseline, 4th and 8th week, whilst invasive measurements on 4th and 8th week. Repeated measurements two-way ANOVA was performed in R studio. Levene and Shapiro-Wilk test with post hoc Tukey HSD tests for adjusting significance level were performed.
RESULTS: Results are presented as mean±SEM at significance level of $P<0.05$. The timing of LV afterload was different between the groups ($P<0.001$) and the LVEF ($P=0.016$), correlating negatively with the timing of peak LV afterload in DB ($r = -.74$, $P=0.035$). The LV hypertrophy defined by the relative wall thickness ratio was different, in descending vs ascending aorta banding (RWT in DB 0.45±0.02; PB 0.67±0.03 $p=0.02$), as the differences in LVEF. Ea was no different ($P=0.8$). Both LV end-systolic elastance (PB Ees 5.86±0.78 mmHg/ml; DB Ees 3.29±0.5 mmHg/ml; $P=0.048$) and the arterial-ventricular coupling (DB 0.53 ± 0.08; PB 0.35 ± 0.03, $P=0.047$) were different after 8 weeks in DB *vs.* PB respectively.
CONCLUSIONS: There are differences in LV systolic function and hypertrophy in different timing of peak LV afterload (late *vs.* early) in descending thoracic *vs.* ascending aorta banding, after 8 weeks in the porcine heart.

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Experience of management aortic coarctation in pregnancy

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BACKGROUND: Native severe coarctation is a condition in which pregnancy is at risk – WHO IV, which means pregnancy is contraindicated. Diagnosis of aortic coarctation is quite poor in developing countries.
METHODS: We are presenting seven cases of secondary arterial hypertension management in pregnant women due to aortic coarctation. Mean age of patients was 25,71±5,28 years. Mean term of gestation at the time of diagnosis was 23,28±5,76 weeks. Mean systolic blood pressure on admission was 175,71±32,58 [from 140 to 240] mmHg.
RESULTS: All patients received antihypertensive drugs. Mean SBP on medication was 147,86±29,70 [from 110 to 200] mmHg. Four patients whose SBP was higher than 160 mmHg had percutaneous intervention for their coarctation. 3 of them had coarctation stenting. Spontaneous uneventful vaginal delivery occurred in 3 women who had intervention before labor. One patient with severe coarctation stenting had caesarian section done due to high residual gradient and arterial hypertension after procedure. Three patients had coarctation stenting after childbirth. All patients with native coarctation were managed with caesarian section and strict blood pressure control. Of them one woman experienced acute aortic dissection type A on the 4-th day after caesarian section. On the same day she had coarctation stenting than supracoronary ascending aorta replacement and patent ductus arteriosus ligation. All pregnancies were completed successfully with healthy babies born in term.
Mean SBP after intervention was 126,42±10,69 [from 110 to 140] mmHg.
CONCLUSIONS: Stenting of coarctation during pregnancy seems to be safe and effective option. There is no sufficient evidence still to draw definite conclusions about the optimal time of interventions.

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Can the stent replace the shunt in symptomatic tetralogy neonates?

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BACKGROUND: In selected cases a staged repair is preferred in symptomatic patients with Tetralogy of Fallot (TOF) in comparison to the neonatal repair. For several years the gold standard has been the aorta-pulmonary shunt. In this study we investigated a novel non-surgical approach, with the assumption that the post-surgical outcome would be the same.
METHODS: In the last decades the use of right ventricular outflow tract (RVOT) stenting is considered to be an adequate alternative. We reviewed RVOT stenting in TOF patients in a total of 39 patients in 3 pediatric cardiac centers. Several parameters pre- and post-stenting and prior to surgery were compared. These parameters consist of age, weight, saturation, size of pulmonary arteries, the direct post-surgical results and operative techniques.
RESULTS: Thirty-nine symptomatic T4F patients underwent stent implantation. No significant differences between the included patients in the three centers comparing age, weight, pre-stent saturation and echocardiographically determined pre-stent pulmonary artery sizes existed. No procedural death occurred and no emergency surgery was necessary. Saturations increased from 85% (69-96%) to 89% (72-98%) ($P=0.0023$). Three of the treated patients needed additional shunts. On six occasions additional interventions were necessary. Thirty-five patients went to surgery, 4 are still awaiting surgery, at a median of 148 and 383 (21-250 and 330-510) days after stenting ($P< 0.0001$). The corrected patients all underwent a trans-annular patch at their corrective surgery and the stents were removed completely.

CONCLUSIONS: Stenting of the RVOT could be an effective alternative in the initial management of TOF patient with restricted pulmonary blood flow. It can be safely performed in different hospital settings, with comparable results. Due to the high incidence of transannular patch application the primary patient group receiving a RVOT stent should be limited to those with very small underdevelopped pulmonary annulus.

Saturday May 25, 2019
08:00 - 09:30

Vascular Abstracts Session 9: Vascular Access

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Outcomes of basilic vein transposition versus polytetrafluoroethylene forearm loop graft as tertiary vascular access

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BACKGROUND: Basilic vein transposition or the use of a forearm (PTFE) loop graft are recommended as tertiary vascular access. The aim of this study is twofold; first, to compare the outcomes and patency rates of patients treated with a basilic vein transplantation to patients treated with a PTFE loop, and second, to identify patient-related factors of influence on patency rates.
METHODS: Data collected in our database of patients with chronic renal dysfunction requiring hemodialysis were analyzed. From 2006 to 2017, 55 patients with a basilic vein transposition and 75 patients with a PTFE loop were included. Patency rates were calculated. Multivariate analysis was used to identify factors of influence on survival. Incidence of complications and reinterventions were calculated and compared.
RESULTS: Mean follow-up time was 29 months. A significant higher 2-year primary assisted patency rate was found for the basilic vein transposition group; 72.7% (6.5%) *vs.* 47.6% (6.2%), (P<0.01). 2-year primary patency rates and secondary patency rates were comparable. Cox regression identified BMI (HR 1.77, 95% CI 1.05-2.98, P=0.03) and age (HR 0.54, 95% CI 0.32-0.91, P=0.02) as predictors for failure regarding primary patency in PTFE loop patients. The incidence rate of total complications was significantly higher in the PTFE loop group with 0.70 per patient year (PY^{-1}) versus 0.28 PY^{-1}(P=0.001). A significant higher PTA and surgical revision rate was found in the PTFE loop group, 1.77 PY^{-1}versus 1.05 PY^{-1}(P=0.022) and 0.22 PY^{-1}versus 0.07 PY^{-1}(P=0.002), respectively.
CONCLUSIONS: In conclusion, in this non-randomized study basilic vein transposition has better patency, fewer complications and fewer reinterventions compared to PTFE loop. Multivariate analysis suggests that especially younger patients and those with a higher BMI could take advantage of getting a basilic vein transposition rather than a PTFE loop.

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Diagnosis and treatment of neurogenic thoracic outlet syndrome according to a dedicated care pathway

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BACKGROUND: Neurogenic thoracic outlet syndrome (NTOS) is a condition caused by compression of the brachial plexus serving the upper extremity. Diagnosis and therapy of NTOS remains disputed. Moreover, surgical treatment (thoracic outlet decompression, TOD) has never been researched in a randomized controlled trial. The reporting standards for thoracic outlet syndrome by the Society of Vascular Surgery aim to produce consistency in diagnosis, description of treatment and assessment of results to allow for more valuable data to be reported. Here, we present the results of the implementation of the reporting standards in our 'NTOS care pathway'.
METHODS: A prospective cohort trial was performed. All patients suspected for TOS that were referred to our clinic between January 1st and December 31 (2017) were included in the study cohort. Diagnosis and treatment was performed according to the reporting standards.
RESULTS: In total, 124 patients were referred under the suspicion of NTOS. After evaluation in a NTOS care pathway including multidisciplinary discussion, 79/124 patients (64%) met the reporting standard criteria and were diagnosed with NTOS. The diagnosis could not be confirmed in 11/45 patients, and in 34/45 patients another diagnosis was established. Dedicated specialized physical therapy was successful in 15/79 (19%) of patients. 3/79 (4%) of patients refrained from further treatment. 61/79 (77%) patients underwent TOD and neurolysis. The disability of arm, shoulder and hand scale (DASH) decreased from 54.78 to 23.22 (P<0.001) and the Cervical-Brachial Symptom Questionnaire score decreased from 76.10 to 29.06 (P<0.001). There were no major complications. Mean hospital admission was 1,55 (±0,69) days.
CONCLUSIONS: Systematic work up of patients suspected for NTOS according to a care pathway based on the reporting standards gives good guidance on diagnostics and treatment of this population. With long-term follow-up, continued clinical relevance should be assessed.

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Perioperative angiography; a forgotten novel risk factor for vascular surgical site infections in the groin?

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BACKGROUND: Vascular surgical site infections (VSSI) are a burden for the affected patients with increased risk of graft failure and the possibility of gaining multidrug-resistant bacteria, prolonged time of recovery and hospital costs. The treating surgeon and vascular surgery unit is as well heavily loaded with repeated vacuum dressing replacements in the operating theatre. The known risk factors are usually difficult modifiable. The aim of this study was to identify modifiable risk factors to reduce VSSI in the groin.
METHODS: Each vascular patient with surgical opening of the groin at our department was consecutively enclosed in our study during a one-year observation period. Known risk factors were documented including renal parameters, liver function, glycated hemoglobin level, body mass index, hypertension, critical limb ischemia and others like performing surgeon, type of prosthesis and duration of operation. Additionally, perioperative percutaneous angiography at the operation site the month before or after surgery was documented.
RESULTS: There was a highly significant (p-value < 0.001) association of perioperative angiography and development of VSSI in our patients. 239 groins in 205 patients were observed resulting in 40 (16.7%) VSSI requiring surgical intervention including 18 (7.5%) minor VSSI requiring necrosectomy with secondary closure of the wound and 22 (9.2%) major

VSSI involving the subcutaneous tissue with repeated vacuum dressing changes before secondary closure. Graft failure and explantation could be avoided in all cases. 45 angiographies were performed perioperative at the operation site resulting in 19 (42.2%) VSSI versus 21 (10.8%) VSSI from these patients not receiving an angiography.
CONCLUSIONS: Our study revealed that perioperative angiography is a highly significant and modifiable risk factor for VSSI. Perioperative angiography will be reduced as much as possible at our department and hybrid treatment with intraoperative angiography will be preferred in the future.

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Outcomes after endovascular mechanical thrombectomy in occluded vascular access used for dialysis purposes

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BACKGROUND: To re-establish patency in occluded vascular access, endovascular mechanical thrombectomy using the AngioJet™ system can be considered. Experience with this system in occluded vascular access is limited, especially in native arteriovenous fistulae (AVF). The aim of this study was to review our results in endovascular mechanical thrombectomy using the AngioJet™ in patients with AVF and arteriovenous grafts (AVG).
METHODS: Data collected in a database of patients requiring hemodialysis for renal failure were retrospectively analyzed. Patients who underwent endovascular mechanical thrombectomy procedures with the AngioJet™ system for occlusion of vascular access were included. Clinical and technical success rates and patency rates were calculated. Multivariate analysis was used to identify factors of influence.
RESULTS: 92 AngioJet™procedures in 60 patients with thrombosed vascular access were reviewed, during a mean follow-up period of 21.5 months in patients with an AVF and 11.9 months in patients with an AVG. Technical success was achieved in 92.6% of the cases with an AVF and 92.0% of the cases with an AVG. Clinical success was achieved in 92.6% of the cases with an AVF and 90.8% of the cases with an AVG. Significant higher primary and primary assisted patency rates were observed in the AVF group compared to the AVG group. Multivariate regression analysis indicated that a left-sided vascular access and female sex were independent predictors for failure regarding primary patency in AVG patients. Furthermore, the use of immunosuppressive drugs and older age were negative predictors for secondary patency in AVG patients.
CONCLUSIONS: The Angiojet™system can be considered as an effective technique in re-establishing patency in occluded vascular access with minimal use of central venous catheters for dialysis. Good technical and clinical success rates were achieved with acceptable patency rates, which were improved in patients with an AVF compared to patients with an AVG.

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ACT guided heparin administration leads to better levels of heparinization in non-cardiac arterial procedures

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BACKGROUND: Heparin is administered to prevent thrombo-embolic complications. Almost all vascular surgeons and interventional-radiologist use a single bolus of 5000 IU. Heparin has a non-linear dose-response and elimination curve in the individual patient. The activated clotting time (ACT) was used, to evaluate the effect of a fixed dose of 5000 IU heparin and it was compared to ACT guided heparinization.
METHODS: ACT was measured during open and endovascular procedures. The ACT was measured before, 5 and every 30 min after heparin administration. In group 1 5000 IU was given. In group 2 after the initial dose of 5000 IU, additional dosages of heparin were administered. In group 3, an initial heparin dose of 100 IU per kilogram was given and additional heparin dosages were administered. In both group 2 and 3 the target ACT was 250 sec. Primary outcome was maximum ACT measured.
RESULTS: In total 250 patients were included (group 1: 150, group 2: 80, group 3: 20). The baseline ACT was 131 ± 17 sec. and the ACT 5 min after the initial dose of 5000 IU was 189 ± 33 sec. In group 1 5% of patients reached an ACT of 250 sec. In group 2 the mean number of additional dosages heparin was 2, with a maximum of 6. In group 2 27% of patients reached an ACT of 250 sec. A negative correlation between bodyweight and ACT was found. In group 3 the mean ACT after the initial dose of 100 IU/kg was 232 ± 42 sec. In group 3 47% of patients reached an ACT of 250 seconds.
CONCLUSIONS: A standard dose of 5000 IU heparin leads to inadequate levels of heparinization in a vast majority of patients. This syudy shows that it should be obligatory to measure the ACT during non-cardiac arterial procedures.

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Prevalence of high on-treatment platelet reactivity to aspirin in patients with PAD treated with PTA

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BACKGROUND: Patients with peripheral artery disease (PAD) following peripheral percutaneous transluminal angioplasty (PTA) are prone to complications following the procedure, despite treatment with aspirin. High on-tratment platelet reactivity to aspirin is associated with increased risk of ischemic events in patients following PTA.
METHODS: 140 patents with PAD undergoing PTA of lower limbs' arteries were included in the study. 29 patients (group1) were not treated with aspirin therapy prior to the admission and all of them started aspirin treatment on the day of admission. 111 patients (group2) were treated with aspirin prior to the admission and the treatment was continued during the study. Two blood samples were collected from every patient: first at the day of admission, second 7days thereafter. We assessed platelet activation pathways involving arachidonic acid receptor. ASPI-tests using multiple electrode aggregometry were performed in all blood samples.
RESULTS: ASPI levels in blood samples obtained on the day of admission were between 61 and 1837. In group 1 ASPI levels were from 244 to 1357 on the day of admission. After a week on aspirin treatment, ASPI levels among them were from 33 to 1057. Therefore, significant decrease of ASPI levels after a week from beginning of aspirin treatment was observed (mean ASPI decrease from 1002 to 368). There were 3 'low responders' in group 1 (ASPI levels on the 7th day: 828, 856 and 1057). ASPI levels on the day of admission among them were: 1267, 1306 and 1188 (the highest ASPI levels obtained in the study).
CONCLUSIONS: High on treatment platelet reactivity and low platelet response to aspirin in patients with PAD following PTA of lower limbs' arteries may be the result of their patelet high reactivity in general. Greater doses of aspirin or other antiplatelet drugs may be required for theese patients to avoid postoperative complications.

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Functional status and out-of-hospital outcomes in vascular surgery patients

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BACKGROUND: Evaluation of the functional dependency of vascular surgery patients has proved to correlate with short-term mortality but lacks data in the long-term. We aimed to determine the correlation between the functional status at discharge and the out-of-hospital mortality.
METHODS: We performed an observational cohort study including non-cardiac vascular surgery patients (open and endovascular) surviving hospital admission of 18 years or older treated in Boston, Massachusetts, USA. The exposure of interest was functional status determined by a licensed therapist at hospital discharge and rated based on qualitative categories adapted from the Functional Independence Measure. The primary outcome was all cause 90-day mortality after hospital discharge. Adjusted odds ratios were estimated by multivariable logistic regression models.
RESULTS: This cohort included 2318 patients (male 51%; mean age 61±17.7). After evaluation by a physiotherapist, 425 patients scored the lowest functional status, 631 scored moderately low, 681 moderately high and 581 scored the highest functional status. After multivariable logistic regression analysis the lowest functional status was associated with a 3.41-fold increased odds of 90-day mortality (95% confidence interval(CI), 1.70-6.84) compared to patients with the highest functional status. When excluding patients who underwent venous interventions the adjusted odds ratio was 6.76 (95% CI, 2.53-18.12) for the 90-day mortality post-discharge. The odds for re-admission within 30-days was 1.5 fold increased in patients who scored the lowest functional status.
CONCLUSIONS: In vascular surgery patients surviving admission, functional status is strongly associated with out-of-hospital mortality and readmission rate. This is especially apparent in patient who underwent a vascular procedure. Ultimately, functional status could become a target to improve the post-operative survival of vascular surgery patients by improving this in the preoperative and postoperative setting.

Saturday May 25, 2019
08:00 - 09:30

Vascular Abstracts Session 10: AAA

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Implications of aortic straightening after endovascular aneurysm repair

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BACKGROUND: By deployment of the endoprosthesis, the angulated aorta is stretched. This causes tension onto the configuration, which could influence the stability of the endograft in the aorta. This study quantifies postoperative change of angulation and curvature (bending rate) in patients with and without late (>1 year) type IA endoleak or migration.
METHODS: Thirty-five patients were identified with late type IA endoleak or migration (>10 mm). The control group consists of 53 patients without complications, with at least a preoperative, a 1-month, and a late (>1 year) CT scan (CT follow-up was similar for both groups). The suprarenal angle was measured between the axis of the suprarenal aorta and the aortic neck, the infrarenal angle between the axis of the aortic neck and the aneurysm sac. Maximum curvature was automatically calculated over the centerline between the lowest renal artery (pre-EVAR) or the proximal end of the endograft fabric (post-EVAR), and the aortic bifurcation. Differences between pre-, and 1-month follow-up, and between 1-month and 1-year follow-up were tested by the paired t-test.
RESULTS: Suprarenal angulation was larger in the complication group, and did not change after endograft deployment in both groups. Infrarenal angulation was similar between groups preoperatively, but reduced significantly after endograft deployment, and increased again during late follow-up in the complication group. Preoperative aortic curvature was significantly larger in the complication group, and decreased significantly after endograft deployment to a curvature below $80m^{-1}$ in both groups.
CONCLUSIONS: The bending capacity of endografts is limited, which can be quantified by curvature. The aortas of patients who developed a complication had sharper angles compared to controls, which was stretched more by the endograft post-deployment. Aortic straightening causes tension that could contribute to device migration and endoleak.

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Early results with the custom-made Fenestrated Anaconda aortic cuff in the treatment of complex AAA

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BACKGROUND: The treatment of complex abdominal aortic aneurysms (AAA) can be performed with a specific custom-made fenestrated aortic cuff.
CASE REPORT: Between 2013 and 2016, 57 custom-made Fenestrated Anaconda™ aortic cuffs were placed in 38 centers worldwide. Postoperative and follow-up data included the presence of adverse events, necessity for reintervention and renal function.
Fifteen clinics participated, leading to 29 cases. Median age at operation was 74(IQR71–78), five patients were female. Two patients were treated for a para-anastomotic AAA after open AAA repair, nineteen patients were treated because of a complicated course after primary endovascular AAA repair and the eight cases were primary procedures for AAA. A total of 76 fenestrations (mean 2.6 per case) were used. Four patients needed seven adjunctive procedures. Two patients underwent conversion, one because of a dissection of the superior mesenteric artery and one because of perforation of a renal artery. Median operation time was 225min(IQR150–260), median blood loss 200mL(IQR100–500) and median contrast volume 150mL(IQR92–260). Primary technical success was was 86% and secondary technical success was 93%. The 30-day morbidity was 7/29 and a mortality rate of 4/29. Between preoperative and median follow-up of 11 months eGFR was reduced statistically significantly (76 to $63mL/min/m^2$). During follow-up nine had an increase in aneurysm sac diameter (5 cases >5mm), 14 cases had a stable or decreased aneurysm sac diameter and in two cases no aneurysm size

was reported. Two cases with a type III endoleak were treated by endovascular means during follow-up. Survival, reintervention free survival and target vessel patency at one year were 81±8%, 75±9% and 99±1%, respectively. After two years these numbers were 81±8%, 67±11% and 88±6%, respectively.
The complexity of certain AAA cases is underlined in this study, and the Fenestrated Anaconda™ aortic cuff is a valid option in selected cases where few treatment options are left.

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15-years of EVAR for infra-renal AAA in a single center: is stricty lifelong surveillance necessary?

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BACKGROUND: Endovascular aortic aneurysm repair (EVAR) in patients with suitable anatomy is the preferred treatment for infrarenal abdominal aortic aneurysm (AAA). Concerns regarding late complications have resulted in close surveillance regimens. The aim of this study was to evaluate the long-term complications and the surveillance regime after EVAR.
METHODS: This was a single-center retrospective cohort study. Last 15-years, all patients who were treated for infrarenal AAA with EVAR were included. We reviewed medical charts and radiological images to identify demographics, complications, re-interventions and death during follow-up. Descriptive statistics were performed and Kaplan-Meier curves were constructed.
RESULTS: In total, 534 patients were included (90% male) with a median age of 73 years (range 63–83). The median aneurysm diameter was 60 mm (range 47–73). The mean follow-up time was 47 ± 41 months. Endoleak was found in 172 (32%) patients; 32 (6%) endoleak type I, 124 (23%) endoleak type II, 14 (3%) endoleak type III, 0 (0%) endoleak type IV, and 2 (0.4%) endoleak type V. Rupture occurred in 7 patients, 6 of them died due to the consequences. The primary endoleak type IA patients were treated conservatively with spontaneous sealing in most cases, 20 (63%) patients with endoleak type I needed a re-intervention. Endoleak type II patients were treated conservatively in 121 (98%) patients; 62% showed spontaneous sealing. All our endoleak type III and type V patients needed a re-intervention. The overall 30-day mortality was 2%. The overall 5-year survival was 76% with a stent-related mortality of 12%. All rupture or stent-related deaths were within the first 3 years of follow-up.
CONCLUSIONS: In our large cohort, we found a lower rate of re-interventions compared to literature, without affecting the rate of rupture. As ruptures did not occur after the third year of follow-up, simplifying the follow-up should be considered.

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The outcome of AFX ENDOLOGIX endograft in preventing TYPE II endoleaks: single center five-year follow-up

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BACKROUND: The AFX endograft, with its anatomical fixing at the aortic bifurcation, presence of a single bifurcated body have minimized the risk of migration and possible iliac branches competition in tight aortic bifurcation The multilayer ePTFE-STRATA attached only to proximal and distal ends of the graft allows ePTFE (Active Sealing) facilitate sac sealing and blocking collateral arteries reverse flow (type I-II endoleak prevention).
The significative contrast media reduction makes AFX as first choice in patients with renal failure. Aim of this work is to evaluate the outcome at five years follow-up.
METHODS: From October 2012 to December 2018, 86 patients with AAA were treated with AFX Endologix endograft (69 infrarenal AAA; 7 unilateral and 2 bilateral iliac aneurysms; 2 anastomotic aortic pseudoaneurysm). IFU indications were not followed in 18% of patients.
In 44, a proximal cuff was deployed (7 Medtronic Endurant cuff, 3 Bolton Relay, 3 Valiant Captivia) and in 12 an iliac extension was implanted, with hypogastric embolization in 6. The average quantity of contrast media was 60 cc. During follow-up (mean 48 months), all patients were controlled by Duplex scan and Angio-CT.
RESULTS: No endoleaks were revealed at completion angiography and 30-day mortality and complication rate was nil. A branch occlusion occurred in two patients. During follow-up, no type I and II endoleaks, graft related mortality and conversion were recorded. Aneurysmal sac shrinkage was observed in 63 (73.5%). In one patient, a possible type II/III endoleak was detected at three months (no AAA diameter increase at three years).
CONCLUSIONS: AFX endograft seems able to minimize type I and II endoleaks and reduce significatively contrast media amount expecially in renal failure patients. Its use combined with different cuff in neck adverse anatomy seems feasible, showing favourable results without adverse effects at the mid-term follow-up.

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Outcome of ruptured abdominal aortic aneurysm repair in octogenarians: a systematic review and meta-analysis

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BACKGROUND: Ruptured abdominal aortic aneurysm (rAAA) is a life threating emergency occurring increasingly in octogenarians. Open (OR) or endovascular aneurysm repair (EVAR) is expensive and is associated with high mortality and morbidity, yet it is the only chance of survival. The outcome statistics of rAAA treatment contains valuable information to make an informed shared decision on treatment. A systematic review and meta-analysis on outcome of rAAA repair in octogenarians is therefore performed.
METHODS: Pubmed, Embase and Cochrane databases were searched for articles published between January 2013 and October 2018 on octogenarians with a rAAA treated with EVAR or OR. Primary outcomes were 30-day, 1-year mortality and ambulatory state.
RESULTS: The search retrieved a total of 1569 articles, of which 8 retrospective studies could be included reporting on 7526 patients in total. Results of all studies included the 30-day mortality in octogenarians, whereas the 1-year mortality was only mentioned in 4 studies. Ambulatory state was not reported in any of the studies. Meta-analysis showed an overall 30-day mortality of 43% (95% CI: 33-53) and a 1-year mortality of 47% (95% CI: 32-62). Patients after EVAR had lower mortality at 30 days (RR 0.50, 95% CI: 0,38-0,67) and at 1 year (RR 0,65, 95% CI: 0,44-0,96).
CONCLUSIONS: The overall 30-day and 1-year outcomes of treatment for rAAA in octogenarians are acceptable. EVAR has a survival benefit after 30 days and 1 year. Data on ambulatory state is needed for better decision making.

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Changes in Anaconda endograft limb configuration after endovascular aneurysm repair

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BACKGROUND: Limb occlusion after endovascular aneurysm repair (EVAR) of abdominal aortic aneurysms (AAA) is observed in up to 6% of the patients. At long term the Anaconda endograft is associated with a relatively high limb occlusion rate. The independent ring-stent configuration of the limbs provides flexibility in angulated anatomy. Yet, shrinkage of the aneurysm may result in changes in the original configuration and infolding of the graft fabric. This so-called "concertina effect" may lead to areas of blood stasis and increased thrombogenicity and thereby contribute to the emergence of limb occlusion. The the aim of this work was to evaluate in detail postoperative change in Anaconda endograft limb configuration.
METHODS: This study used postoperative ECG-gated CT scans of 13 AAA patients with an Anaconda endograft. These patients participated in a clinical observational trial (Trialregister.nl identifier NTR4276) and were followed by protocol for 24 months after EVAR. Postoperative changes from discharge to 24 months in limb length and distances between the individual nitinol rings of the limbs were evaluated. The length of the limbs was measured as the length of the center lumen line. For each patient the mean and minimal distances between individual rings were automatically calculated and averaged for each limb after applying a previously validated segmentation algorithm.
RESULTS: At 24 months follow-up the average length of the Anaconda endograft limbs had decreased by 10.2 ± 1.1 mm (P<0.001). The mean distances between rings decreased on average by 0.17 ± 0.24 mm (P=0.001). The minimal distances between rings decreased on average by 0.37 ± 0.38 mm (P<0.001).
CONCLUSIONS: The length of the Anaconda limbs significantly decreased 2 years after EVAR as well as the inter-ring distances of the limbs. This observation may be associated with the relatively high emergence of limb occlusions.

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Aortic endograft infections

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BACKGROUND: Endovascular treatment has become the standard procedure for patients with aortic aneurysms. The treatment of aortic endograft infection are contradictory. The aim is to analyze explant of infected endograft and its outcomes.
METHODS: We retrospectively analyzed our prospectively collected database between 2014 and 2018 during which time 558 endovascular procedures (EVAR/TEVAR/BEVAR/FEVAR) were performed and 186 open procedures for AAA/TAA(A). During this period, nine infected endovascular graft explants due out of which four had been implanted in our institution (infection rate 0.5%). The others had been implanted elsewhere. The index operation was EVAR (N.=6), TEVAR (N.=2), or BEVAR (N.=1).
RESULTS: The mean age of the seven males and two females was 67,7 (range 55 to 78) years. The mean time elapsed till the endograft explant was 2.6 years. The primary indication (4 patients) for the endograft was one plaque rupture TAA with later esophageal perforation, TAA in one case with a perforated sigmoid, in one BEVAR case had seven months later a psoatic abscess and the final patient with an iliac side branch had sepsis and endoleak 5 years after the index procedure. Causative agents were s. aureus, enterococcus, pseudomonas, e. coli and streptococcus, but in one case agent could not be found.
The aortic reconstruction was done with the superficial femoral veins in four cases and in four cases an aortic allograft and the final got a prosthetic graft. All but one female survived the first 30-days and another female died within 90 days. The follow-up was in average 12.7 month range (1 to 54 month), during which time another patient succumbed. Several redoes were necessary with in mean 1.7 per patient.
CONCLUSIONS: Surgical removal of endograft is an option for treatment of endograft infection, repeated operations were necessary.

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Open surgical conversion after EVAR. Analysis and follow-up of a referral center experience

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BACKGROUND: The increasing popularity of endovascular aneurysm repair (EVAR) has led to its liberalisation including in situation wherein anatomy qualifies the patient as outside IFU. Simultaneously, the number of open surgical conversion is growing. Analysis of factors leading to open is paramount to improve surgical decision. The present work reports on our experience of open surgical conversion after EVAR.
METHODS: Single center retrospective study. Patients operated on for EVAR failure between Dec. 2013 to Nov. 2018 were included. Patients characteristics, indication and postoperative course have been analyzed.
RESULTS: Overall, 26 patients (mean age 75 yo) have been included. Thirty-nine percent of the patients were initially operated on in our center and 61% were referred. EVAR consisted in bifurcated endograft in 73% of the cases and aorto-uni-iliac in 27% of the cases. Mean time interval between EVAR and conversion was 5.3 years. Indication for conversion was as follow: Type 1a EL (43%); Type 1b EL (5%); Type 2 EL (10%); graft infection (37%); rupture without clear etiology (5%). At the time of conversion, mean aortic diameter was 56.3mm. Aortic cross-clamping was realized below renal artery, above renal artery, above SMA, above CT, or at the level of descending thoracic aorta in 4%, 27%, 23%, 32% and 14% of the cases, respectively. Endograft removal was complete in 91% of the cases with surgical reconstruction (5 arterial allograft) and partial in 9% of the cases. In the postoperative course, 1 patient died of MOF and transitory renal failure was observed in 42% of the cases. After a mean follow-up of 21 months no aneurysm-related death was noted.
CONCLUSIONS: Open conversion following EVAR is likely to increase in the foreseeable future. The main reasons are EL and infection. Open conversion with graft removal is associated with acceptable outcome.

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Staged versus synchronous coronary and carotid artery revascularization

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BACKGROUND: We aimed to compare immediate results of simultaneous and staged revascularization in patients with concomitant coronary and carotid artery stenosis.
METHODS: this research includes 45 patients, operated in the RRCEM at the period of 2013 - 2018 years. Patients were divided into two groups: the first group (simultaneous) – 20 patients – simultaneous carotid endarterectomy and coronary artery bypass grafting off-pump or on-pump: second group (staged) – 25 patients, staged carotid endarterectomy and coronary bypass grafting. Both groups were comparable by sex and age. Indications for simultaneous or staged approach based on significance of stenosis both in carotid and coronary artery basins and severity of symptoms. In postoperative period the incidence of main cerebro-vascular events (myocardial infarction, stroke, all cause death) and postoperative stay duration were assessed.
RESULTS: Patients included in simultaneous group underwent carotid endarterectomy followed by off-pump coronary artery bypass surgery (19/95%), in one case (5%) due to hemodynamical deterioration we turned on-pump. In the staged group, in all 25 (100%) cases, the coronary bypass step was performed off-pump. The index of grafted vessels was 3.6 for the simultaneous and 3.4 for the staged group.
In the early postoperative period, cerebral circulation disorders were observed in both groups and differed statistically not significant (1(5%) *vs.* 1(4%); P=0,7). In simultaneous group one patient (5%) died due to pulmonary complications, in the second group no mortality was observed. The average duration of the postoperative hospital period was 8,8±1,2 days for the patients operated simultaneously; patients of the staged group, stayed at hospital overall 15,2±1,5 days; due to two-time hospitalization.
CONCLUSIONS: We can conclude that simultaneous and staged approach in surgical revascularization among patients with combined carotid and coronary artery stenosis showed no difference regarding to main cerebro-vascular and cardiac events. Staged approach accompanied with relatively longer postoperative in-hospital period.

3

The immediate and midterm results of ascending aortic aneurysm repair in low volume center

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BACKGROUND: the immediate and mid-term results of surgical treatment of ascending aortic aneurysms in single low-volume Center were analyzed.
METHODS: During the period of 2016-2018 years 12 patients were operated with the aneurysm of the ascending aorta. The mean age of the patients was 52.5 ± 2.7 years (28-70 years).The average diameter of the ascending aorta in its widest part was 6.5 ± 0.8 cm (5.2-9.5 cm). In all cases, the aortic aneurysm was combined with the aortic valve disease, of which in 10 cases the aortic aneurysm was caused by aortopathy associated with the bicuspid aortic valve. In one case, the aneurysm of the ascending aorta was combined with symptomatic stenosis of the tricuspid aortic valve, the average gradient on the valve was 103 mm Hg, and in the remaining one case ascending aortic aneurysm was associated with Marfan syndrome. Mean CPB time was 304.4±59.2 min; mean aortic cross-clamp time – 207.5±55.7 min. In 11 cases, the aortic root composite graft replacement procedure (mechanic valve St.Jude Medical; tubular prosthesis - Vascutek) was performed, in three cases coronary artery bypass grafting procedure was performed concomitantly. In one case, isolated aortic valve and ascending aorta replacement procedure was performed.
RESULTS: Average amount of blood lose postoperatively was 725±183.2 ml. The average duration of the postoperative hospital period was 12,8±1,2 days. In the early postoperative period nor any postoperative complications or death were observed. Mean follow –up period consisted 16.8 ±7,2 months, during this period two patients died due to valve related complications (thrombosis and gastro-intestinal bleeding).
CONCLUSIONS: Surgical treatment of the ascending aortic aneurysms in low-volume center can be associated with satisfactory immediate and midterm results.

4

Off-pump coronary artery bypass grafting in patients with left ventricular dysfunction

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BACKGROUND: we evaluated the immediate results of surgical treatment of patients with chronic ischemic heart disease and reduced left ventricular function.
METHODS: 89 patients with reduced left ventricular ejection fraction underwent off-pump coronary artery bypass grafting during the period from December 2013 to January 2018. The mean age was 57.7 ± 6.8 years. All patients had congestive heart failure on admission and episode of myocardial infarction. The 35 patients (39.3%) had symptoms of angina of high functional class III and IV, and 49 (55.1%) and 5 (5,6%) patients respectively were operated with unstable angina or ongoing myocardial infarction. The average ejection fraction was 31.4 ± 4.0%; the average left ventricle EDV - 223.8 ± 54.8 ml. The EuroSCORE perioperative risk of death was 5.7 ± 2.2, which corresponds to the expected death rate of 7.9 ± 4.5%. The average number of bypassed vessels was 2.48 ± 0.67, 13 (14.6%) patients underwent endarterectomy from the coronary arteries due to their diffuse lesion.
RESULTS: in early postoperative period died 3 patients (3.3%). The ejection fraction and the end diastolic volume of the left ventricle after surgery were 34.3 ± 6.6% and 168.5 ± 45.1 ml respectively. All patients in early postoperative period faced heart failure treated by inotrope infusion. In 45 (%) cases the rhythm disturbances and in 2 patients (2.2%) - cerebral circulation disorders were observed. During 30 day observation a significant increase in the cardiac index was noted (1.64 ± 0.29 l / m2 / min before the intervention against 2.48 ± 0.55 l / m2 / min).
CONCLUSIONS: off pump coronary artery bypass in patients with chronic ischemic heart disease complicated by left ventricular failure is an effective technique, with satisfactory mortality and morbidity in early postoperative period.

5

Bilateral versus unilateral internal thoracic artery revascularization in patients with multivessel coronary artery disease

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BACKGROUND: We aimed to compare incidence of bleeding, wound complications and major cardiac events among patients underwent

coronary artery bypass grafting procedure using BITA *vs.* LITA harvesting.
METHODS: The study included 43 patients who underwent surgery in the department of cardiac surgery from October 2016 to January 2018. All patients were divided into 2 groups: the first group consisted of 25 patients who underwent coronary bypass with the use of the left internal thoracic artery and venous grafts (LITA+SVG), the second group – 18 patients underwent CABG using both internal thoracic arteries for myocardial revascularization (BITA+SVG). The age of the patients ranged from 47 to 66 years (the average - 55 years). In both groups, all patients were male.
RESULTS: In the first group, 14 patients had stable angina, the remaining 11 patients had unstable angina. In the BITA+SVG group, all patients had unstable angina. The revascularization index was 3.1 for the patients of LITA+SVG group and 3.1 for the BITA+SVG group. In the early postoperative period, acute myocardial infarction, stroke and mortality were not observed in any case. The average blood-loss in drainage tube during first postoperative day was 280 ± 15 ml and 305 ± 23 ml for the LITA+SVG and BITA+SVG groups, respectively. It should be noted that in the first and second groups, were not observed any wound related complications.
CONCLUSIONS: this comparative study showed that BITA and LITA harvesting doesn't influence early postoperative period. Both methods accompanied by satisfactory results regarding to bleeding, wound healing and major cardio-cerebral events in patients with multivessel coronary artery disease.

6
Immediate and midterm results of thoracic aortic aneurysm repair (an initial experience)

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BACKGROUND: the immediate and mid-term results of surgical treatment of patients with ascending aortic aneurysms in single low-volume Center were analyzed.
METHODS: 12 patients with the aneurysms of the ascending aorta were operated in the period from 2016 to 2018. The mean age of the patients was 52.5 ± 2.7 years (28-70 years).The average diameter of the ascending aorta in its widest part was 6.5 ± 0.8 cm (5.2-9.5 cm). In all cases, the aortic aneurysm was combined with the aortic valve disease, of which in 10 cases the aortic aneurysm was caused by aortopathy associated with the bicuspid aortic valve. In one case, the aneurysm of the ascending aorta was combined with symptomatic stenosis of the tricuspid aortic valve, the average gradient on the valve was 103 mm Hg, and in the remaining one case ascending aortic aneurysm was associated with Marfan syndrome. Mean CPB time was 304.4±59.2 min; mean aortic cross-clamp time – 207.5±55.7 min. "In 11 cases, the aortic root composite graft replacement procedure (mechanic valve St.Jude Medical; tubular prosthesis - Vascutek) was performed, in three cases coronary artery bypass grafting procedure was performed concomitantly. In one case, isolated aortic valve and ascending aorta replacement procedure was performed."
RESULTS: Average bleeding after operation was 725±183.2 ml. The average duration of the postoperative hospital period was 12,8±1,2 days. In the early postoperative period nor any postoperative complications or death were observed. Mean follow-up period consisted 16.8 ±7,2 months, during this period two patients died due to valve related complications (thrombosis and gastro-intestinal bleeding).
CONCLUSIONS: Surgical treatment of the ascending aortic aneurysms in low-volume center can be associated with satisfactory immediate and midterm results.

8
Causes of coronary artery stent thrombosis in patients presenting acute coronary syndrome

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BACKGROUND: To analyze the stent thrombosis in patients presenting with acute coronary syndrome and to determine the influence of the combination of diverse factors responsible for development of stent thrombosis of coronary arteries.
METHODS: According to the classification of Academic Research Consortium proposed in 2006 on stent thrombosis, we have carried out a retrospective analysis: 404 (55,6%) patients.
There has been analyzed the influence of some factors on development of the stent thrombosis, for what the following variables were included into the prognostic model of proportional risks.
RESULTS: Stent thrombosis was detected in 8 (1,9%) patients with ST-segment elevation MI and without it according to angiographic data who underwent a stenting, males - 7 (87,5%), females - 1 (12,5%). Stent thrombosis has appeared in 7 (87,5%) patients with ACS with ST-segment elevation and in 1 (12,5%) patient with ACS without ST-segment elevation in 12th days after stent implantation. Stent thrombosis in acute period (0 - 24 hours) was found in 1 (12,5%) patient, in subacute period (24 hours - 30 days) — in 6 (75%) patients, there were no patients in late period (from 30 days till 12 months) and in very late period (after 12 months) — only 1 (12,5%) patient. In 4 (50%) cases stent thrombosis was located in anterior descending artery, in 2 (25%) cases – in diagonal artery, in 2 (25%) cases – in right coronary artery.
CONCLUSIONS: In our analysis the general rate of stent thrombosis was 1,9%. In PCI for stent thrombosis the second stent is implanted only in case of severe residual dissection. If unstable plaque is the cause of thrombosis contributing the protrusion of a tissue and its coming out of stent cells into vascular lumen, the repeated stent in stent implantation can be required.

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Our strategy in acute type A aortic dissection

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BACKGROUND: Type A aortic dissection carry a high risk of morbidity and mortality. We presented a 62-year old man developing Stanford type A aortic dissection.
METHODS: He had hypertension, hyperlipidemia, and was smoker. The enhanced CT revealed Stanford type A aortic dissection.
RESULTS: He was taken into operation room. Median sternotomy was performed. Access to the right atrium and right subclavian artery was obtained. Myocardial protection was achieved by direct antegrade administration of isothermic blood cardioplegia into both coronary ostia and retrogadely via coronary sinus. Proximal of truncus brachiosefalicus and left carotid artery were dissected. A 8 mm dacron tube graft was

anastomosed to the left carotid artery. A 28 mm dacron tube grat was anastomosed to the proximal descending aorta with sandwich technique. Proximal portion of truncus brachiosephalicus was ligtured. Proximal of left carotid artery and right subclavian artery grafts were anastomosed to the tube graft between aortic annulus and proximal descending aorta The cardiopulmonary bypass time, cross-clamp time, selective antegrade cerebral perfusion time , and systemic circulatory arrest time were 250 min,195 min, 70 min, and 6 min, respectively.
CONCLUSIONS: Unilateral selective antegrate cerebral perfusion with moderate hypothermic circulatory arrest remains a safe strategy for cerebral and visceral protection during emergent surgical repair of acute type A aortic dissection.

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Combined atherosclerotisis of coronary and carotid arteries. What and when to operate?

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BACKGROUND: To present the results of surgical treatment of patients with multifocal atherosclerosis based on a differential approach of surgical strategy.
METHODS: During the period from 01/01/2015 - 01/11/2018 in FCCVS n.a. S.G. Suhanov, Perm we operate 154 patients with combined atherosclerosis of coronary and carotid arteries included in the research. In 66 patients (43%) we performed combined operation CABG with CEA and in 88 (57%) patients we performed underwent stage treatment. Depending on our differential approach we select simultaneously or stage treatment. We divided the patients into 2 groups: A - 66 patients on simultaneously treatment, and B - 88 patients we used stage treatment. Groups did not differ among themselves in indicators.
RESULTS: In a group with combined surgical correction we have 2 (3%) cases of perioperative stroke, 1 (1.5%) case myocardial infarction, and 2 (3%) cases bleeding. In the group of stage treatment there was have 2 (2.3%) cases of perioperative stroke, 1 (1.1%) case myocardial infarction, and 3 (3%) cases bleeding. Mortality in all groups was 0.
CONCLUSIONS: Combined surgical treatment of coronary and carotid arteries atherosclerosis does not increase the risk of postoperative complications in comparison with stage treatment. The proposed approach of treatment methods for combined lesions of the carotid and coronary arteries.

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Negative correlation between body mass index and chest tube output after coronary artery bypass grafting

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BACKGROUND: Obesity is a well-known and obvious threat for humanity but some contradictory outcomes have been encountered during previous medical research. Interestingly, obesity was recognized as a protective factor for some specific obesity related situations. We aimed to show the relation between increased Body Mass Index (BMI) and chest tube output after coronary artery bypass grafting (CABG).
METHODS: We retrospectively collected data of 421 patients underwent isolated CABG surgery between dates of December 2015 and December 2016. Obtained BMI values were grouped into classes, determined by AHA and World Health Organization, which were; underweight (<20kg/m^2), normal weight (20 – 25 kg/m^2), overweight (25 - 30 kg/m^2), obese (30 - 35 kg/m^2) and severely obese (>35 kg/m^2). Postoperative chest tube output volume corresponded drainage at first twenty-four hours after CABG surgery.
RESULTS: Mean age was found 61.6 (± 1.06) years. Female to male ratio was found 40.9/59, 6 (N.=170/251). Patient population was divided into 2 groups as BMI below and above 30 kg/m^2 to coarsely evaluate the relation between BMI and chest tube output. 193 patients were in non-obese group and 136 patients were in obese group. Mean drainage amounts of non-obese and obese groups were 630 ± 360 milliliters and 463 ± SD 303 milliliters respectively. We ran independent *t*-test to evaluate the relation between BMI and chest tube output. It was statistically significant. We decided to evaluate the relation between drainage and five different BMI subgroups. ANOVA showed, statistically significant chest tube output difference between normal and obese groups, as well as severely obese group.
CONCLUSIONS: BMI is negatively correlated with bleeding after CABG surgery. BMI should considered to be included in future bleeding prediction systems.

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Xenon anesthesia for patients undergoing cardiopulmonary bypass: a systematic review and meta-analysis

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BACKGROUND: Cardiopulmonary bypass has significant hemodynamic instability that may result in perioperative organ injury, including myocardial infarction, stroke and postoperative cognitive delirium. Numerous clinical trials indicated minimal hemodynamic side effects and substantial organoprotective properties of Xenon. We therefore systemically searched and analyzed the available literature to evaluate the efficiency, safety, and potential advantages of xenon anesthesia for patients 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 comparing xenon anesthesia during cardiopulmonary bypass.
RESULTS: From a total of 90 entries identified, 5 RCTs were appropriate for inclusion into the final analysis. This meta-analysis indicated a statistical significant difference comparing Xenon with Placebo regarding Primary outcomes such as Cardiac index (CI)(MD= 0.33, 95% CI [0.10, 0.57], P=0.005), systemic vascular resistance index (SVRI)(MD= -512.03, 95% CI [-706.44, -317.62], P=0.00001), left ventricular stroke work index (LVSWI) (MD= 3, 95%CI [0.69, 5.31], P=0.01) and Central venous pressure (CVP) (MD= -1 , 95%CI [-1.83, -0.17], P=0.02).The overall pooled estimate showed that Xenon had lower risk for adverse events such as Sepsis (OR = 0.57, 95%CI [0.17, 1.93]), Hypotension (OR = 0.80, 95%CI [0.58, 1.10]), Acute kidney injury (OR= 0.23, 95% CI [0.02, 2.14]), Cardiac tamponade (OR= 0.36, 95% CI [0.08, 1.54]) and Mortality (OR= 0.45, 95% CI [0.10, 2.06]). While Xenon had higher risk of Serious side effects (OR= 1.16, 95% CI [0.45,2.98]), Delirium (OR= 1.17, 95% CI [0.57, 2.40]) and Atrial fibrillation (OR= 1.35, 95% CI [0.98, 1.86]) compared to control.

CONCLUSIONS: This meta-analysis showed that in patients undergoing CRP using of Xenon showed a statistically significant regarding most measured efficacy outcomes compared with other inhaled and IV anesthetics. Well-conducted and reported randomised trials are needed comparing xenon with other inhaled and IV anesthetics.

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Optimal perfusion for aortic dissection: conversion to direct cannulation of the ascending-aorta to prevent malperfusion

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BACKGROUND: Malperfusion is a severe complication of type A acute aortic dissection (AADA). The best means of adequate inflow is unclear. The femoral artery (FA) or axial artery is often used. Antegrade perfusion options with Seldingertechnique include ventricular apex or ascending aorta. However, in some cases, these methods are insufficient to maintain cardiopulmonary bypass (CPB). We investigated whether direct ascending aorta cannulation could avoid malperfusion.
METHODS: Over 4 years, 132 cases of surgical reconstruction of AADA were analysed. FA cannulation was initially selected in all cases. In the case of malperfusion, the cannula was inserted directly into the lumen of the ascending aorta during venous drainage to the right atrium. A wire-reinforced endotracheal tube was used.
RESULTS: Group F (FA cannulation, N=106) and Group A (direct ascending aorta cannulation, N=26) were compared. In both groups, patient background was similar. Time from skin incision to cannulation was significantly shorter and time from CPB to hypothermic cardiac arrest (HCA) was significantly longer in Group F than Group A (14±0.6min *vs.* 18±1.3min, P<0.01, and 36±1.3min *vs.* 30±2.8min, P<0.01, respectively). However, time from skin incision to HCA was not different between Groups F and A (49±1.2min *vs.* 48±2.6min, respectively). No significant difference was observed between Groups F and A in time required for CPB, aortic cross clamp or HCA (152±3.5min *vs.* 154±7.3min, 118±2.8min *vs.* 124±5.9min, 42±1.3min *vs.* 46±2.7min, respectively). Postoperatively, the incidence of stroke and cardiac death was not different between the 2 groups (13.2% *vs.* 19.2% and 13.2% *vs.* 15.3%, respectively).
CONCLUSIONS: In AADA, conversion to antegrade perfusion directly via the ascending aorta might be a safe option compared with FA retrograde perfusion. Furthermore, hypothermia for circulatory arrest is achieved quickly. Conversion to this technique could be useful to achieve optimal perfusion in cases of malperfusion.

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Comparative analysis of moderate and deep hypothermia with pulmonary endarterectomy

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BACKGROUND: From 2010 to 2017, 47 pulmonary endarterectomy (PEA) were performed. The article compares two groups of patients operated under deep and moderate hypothermia using intermittent circulatory arrest (CA).
METHODS: All patients who underwent PEA (N.= 47) were divided into 2 groups depending on the level of hypothermia: first group (N.= 37) - deep hypothermia (18 - 20 ° C), second group (N.= 10) - moderate (22 - 24 ° C). The mean age was 51 ± 12 and 49 ± 16 years old. Preoperative diagnostic data: average PAP - 48 and 54 mmHg, PVR - 969 and 990 dyn*s/cm^5, respectively. The operation was carried out according to the standard protocol. The duration of CA for the first group did not exceed 20 minutes, for the second - 15 minutes.
RESULTS: Cardiopulmonary bypass time was 231 and 254 min, aortic clamping time - 134 and 150 min, the mean number of CA is 2.8 and 3.5; the total CA time was 35.2 and 41.4 min, respectively. There was a significant decrease of pulmonary hypertension (P<0.05) in the early postoperative period, in both groups: average PAP - 25.3 and 27 mmHg, PVR - 283 and 305 dyn*s/cm^5, respectively. The intensive care unit stay was 4 days in average in both groups. There were 7 cases (4 and 3) of transient neurological disorders, which regressed at the time of discharge. Two patients in the first group died.
CONCLUSIONS: The number of early hospital complications doesn't differ significantly in both groups of patients, but PEA at moderate hypothermia needs more periods of CA and more time. Our results show a significant decrease in PVR.

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Hybrid coronary revascularization: alternative to standard technique of CABG

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BACKGROUND: The analysis of the results of hybrid coronary revascularization in comparison to conventional operations.
METHODS: 3550 patients were operated on by one surgical team in the period from 2010 to 2017. 124 patients (3,5%) have been operated on using hybrid coronary revascularization including full arterial revascularization of the LCA off pump technique without any manipulations on the ascending aorta with PTCA of the RCA (G1 group), 124 patients have been operated on by the standard technique, including a cannulations of the ascending aorta and/or vein bypasses (G2 group). Both groups were comparable in terms of preoperative risk factors, including the Euroscore II score (G1 1,9 % *vs.* G2 1,1 %). All patients in G1 (100 %) were operated on with dual antiplatelet therapy *vs.* 0 % in G2.
RESULTS: Revision for surgical bleeding was 0,8 % (G1) *vs.* 1,6 % in (G2), P=0,97. The frequency of perioperative acute myocardial infarction was 0,8% (G1) *vs.* 1,6% (G2), P=0,97. Requirement of repeat revascularization was 2,4% (G1) *vs.* 0% (G2), P=0,97. Between the groups studied there was comparable recurrence of angina pectoris in 12 month follow-up: 10% (G1) *vs.* 8% (G2), P=1,0, also there was revealed the same rate of the arterial grafts disfunction, 2,4% (G1) *vs.* 2,4% (G2), P=1,0. The quantity of neurological complications was lower in G1 (0% *vs.* 1,2% in G2), p 0,97. At the same time there was revealed the best potency of coronary stents in comparison to venous anastomosis after 12 month follow-up: 99,2% (G1) *vs.* 97,6% (G2), P=0,97. The total quantity of adverse events (MACCE) was 3,2% (G1) *vs.* 3,2% (G2).
CONCLUSIONS: The hybrid coronary revascularization demonstrate adequately early and long term results with the careful screening of patients and can therefor be used as an effective alternative to the standard procedures of CABG.

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Using computer tomograhpy for evaluation graft patency in early postoperative period after CABG

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BACKGROUND: To assess the results of CT coronary angiography performed in the early postoperative period in patients undergoing coronary bypass surgery.

METHODS: Between January 2015 and December 2017, 1,701 patients were surgically operated on at the the Ural Cardiology Institute for ischemic heart disease. Out of 1701 patients, there were 458 women (26.9%) and 1243men (73.1%). The average age was 63.3 ± 8.3 years. Patients underwent MSCT angiography in the early postoperative period after CABG. Exclusion criteria for CT coronary angiography were: respiratory arrhythmia, sinus tachycardia, ventricular or atrial extrasystole, atrial fibrillation and allergic reaction to contrast.
RESULTS: In the early postoperative period CT coronary angiography was performed in 216 patients (12.7%). In the analysis, 605 distal anastomoses were evaluated, of which 252 venous grafts and 353 arterial grafts. Thirty-one (14.3%) patients underwent single-vessel surgery, 57 (26.4%) patients had 2 shunts, 74 (34.3%) had 3 shunts, 36 (16.7%) had 4 shunts, 15 (6.9%) patients had 5 shunts and 3 (1.2%) patients had 6 shunts. Using MSCT, acute occlusion of 14 (2.3%) anastomoses was detected. In 1 case, the patient underwent a bimammary coronary bypass with the formation of t-graft, CT coronary angiography revealed an occlusion of the anastomosis of RIMA - Marginal Artery, but on selective coronary angiography shuntography, when contrasting the T-graft, all shunts were found to be passable. Thus, this patient was not included in the number of patients with occluded anastomoses. And acute occlusion was detected in 13 (2.1%) anastomoses.
CONCLUSIONS: CT coronary angiography is an affordable and effective method for assessing the consistency of distal anastomoses in the early postoperative period in patients after CABG and can be routinely used in a cardiosurgical clinic.

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Preoperative evaluation of pulmonary function for mitral valve surgery well predict postoperative pulmonary complications

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BACKGROUND: The purpose of this study is to determine the role of preoperative pulmonary function evaluation (PFTs) in patients scheduled for mitral valve (MV) surgery with or without tricuspid valve(TV) repair. Also to evaluate the association between pulmonary function derangements and perioperative morbidity and mortality.
METHODS: This case series study was conducted in a period of 6 months, in 2017 on 103 patients with preoperative PFTs who were selected for MV repair (N.=20) or MV replacement(N.=83). Patients who underwent concomitant TV repair surgery were included, however, patients undergoing any other cardiac surgeries or have previous valvular surgery were excluded. Outcomes were studied in the combined MV repair and MV replacement groups and within each of them. The patient's demographic information and echocardiographic and PFT results were collected. The association between pulmonary function derangements and intraoperative blood product transfusion, intubation time, intensive care unit (ICU) stay, hospital stay was evaluated.
RESULTS: There was not any mortality in first 30 days after the surgery. These patients had significantly lower PFT parameters (P value=0.02). The spirometric parameters showed significant correlation with increasing intubation time: forced vital capacity (FVC, r = -0.25, P=0.01), forced expiratory volume in one second (FEV1, r = –025, P=0.01), mid expiratory flow (MEF75, r = –0.33, P=0.001), MEF50 (r = –0.23, P=0.02), MEF2575 (r = –0.20, P=0.04), PEF (r = –0.26, P=0.007) and with intraoperative blood product transfusion: FVC (r = –0.30, P=0.001), MEF75 (r = –0.25, P=0.01), FEV1 (r = –0.24, P=0.01) FEV1/FVC (r = 0.28, P=0.004) PEF (r = –0.32, P=0.001). Hospital stay were correlated to FVC% predicted (r = –0.2, P=0.03), FEV1/FVC% predicted (r = 0.32, P=0.01).
CONCLUSIONS: This study indicates that most patients who need MV replacement or MV repair have abnormal PFT results in our center. The consistency of the adverse correlation between derangement in PFT results and morbidity after MV surgery suggests that PFTs should be a routine part of the preoperative tests for patients who are candidates for MV surgery.

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Pioneering cardiac surgery services in tertiary care hospital of Khyber Pakhtunkhwa Province of Pakistan

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BACKGROUND: Establishing safe Cardiac Surgical practices, as a new setup from the start in Tertiary Care Hospital of Khyber Pakhtunkhwa, Pakistan; was not an easy task, especially at a very young age. I want to present the successful story of establishing Cardiac Surgery Unit in Medical Teaching Institute-Hayatabad Medical Complex (MTI-HMC) Peshawar, Pakistan.
METHODS: We established a new setup in public sector hospital. All the patients operated by Dr. Muhammad Aasim in Hayatabad Medical Complex Peshawar KP, from 1st December 2017 to 31st December 2018 are included in this study. Data of the patients were recorded prospectively in the dedicated computer in MS-Excel format. Patients were grouped into Open Heart Cardiac Surgical Procedures and Closed Heart Surgical Procedures. The Surgical procedures were further segregated into Coronary, Valvular, Congenital and Combination / Complex categories. Some special procedures were also performed and documented accordingly.
RESULTS: Total of more than 350 Patients were operated by Dr. Muhammad Aasim in the mentioned time period. All the Surgical Patients received quality surgical treatment as per standard protocols and have very good outcome.
CONCLUSIONS: Cardiac Surgery Services can be established safely, even by very young properly trained Cardiac Surgeons, in any new setup having Cardiology services.
KEY WORDS: Cardiac Surgery, Cardiac Surgery Unit, Hayatabad Medical Complex, Peshawar.

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Cardiac surgery services in less facilitated deprived world; helping the needy people beyond borders

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BACKGROUND: To establish safe Cardiac Surgical practices in less facilitated deprived parts of the world for helping the needy people beyond borders.
CASE REPORT: All the patients operated by Dr. Muhammad Aasim in Amiri Medical Complex Kabul Afghanistan, from 10th July 2016 to 30th November 2017 were included. Data was recorded prospectively in the

dedicated computer in MS-Excel format. Patients were grouped into Cardiac Surgical Procedures (further divided into Open Heart & Closed Heart procedures), Vascular Surgical Procedures, Thoracic Surgical Procedures and Miscellaneous Surgical Procedures (Isolated IABP insertion, Re-exploration, debridement & rewiring; etc).
Total of 338 Patients were operated by Dr. Muhammad Aasim in the mentioned time period. There were 211 Cardiac Surgical Procedures consisting of 183 Open Heart Surgeries and 28 Closed Heart Surgeries. Vascular Surgical procedures of different types were 85 in number. Twenty seven (27) patients were operated for Thoracic Surgical procedures. Patients requiring Miscellaneous Surgical procedures were 15 in number.

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Minimally invasive mitral valve replacement in rheumatic disease with continuous suture technique

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BACKGROUND: Minimally invasive mitral valve surgery has become a routine procedure in many institutions. The disadvantage of this approach is prolonged aortic cross-clamp and cardiopulmonary bypass (CPB) times. Replacement mitral valve with continuous suture technique helps reduce cross-clamp time and CPB time. We report our preliminary experience with patients undergoing minimally invasive isolated mechanical mitral valve replacement in rheumatic disease with continuous suture technique.
METHODS: Between January 2018 and October 2018, a total of 15 patients with mitral valve rheumatic disease underwent replacement mechanical valve with continuous suture technique through a right small thoracotomy with peripheral cannulation at Vietnam National Heart Institute. We analyzed the 30-day mortality and postoperative complications of this group.
RESULTS: The mean age was 50.4 ± 7.6 years consisted of 5 (33.3%) males, mean LVEF was 64.7±5.2 %, mean NYHA was 2.5 ± 0.49. There were 8 (53.3%) patients were performed concomitantly left appendage exclusion. Intermittent ante-grade warm blood cardioplegia was used as myocardial protection in all patients, mean CPB time 87.9 ± 20.1 min, cross-clamp time 53.7 ± 13.9 min, mean mechanical ventilation time was 12.9 ± 8.9 hours. Mean ICU time was 47.5 ± 16.62 hours. Length of stay was 11.7 ± 3.9 days. Complications: No conversion to median sternotomy needed; No cerebrovascular accidents; Groin seroma: 1 (6.7%) patient; Pneumothorax: 2 (13.3%) patients; Overall 30-day mortality was 0%. Predischarge echocardiography revealed no residual.
CONCLUSIONS: Our preliminary result was acceptable and demonstrated that minimally invasive mitral replacement with continuous suture technique can be performed safely and effectively and help reduce the cross-clamp time and CPB time, however long-term follow-up as well as large numbered, multi-centered research are needed for further assessment.

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Identification of lncrnas in aortic valve calcification patients with bicuspid aortic valve

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BACKGROUND: An individual with bicuspid aortic valve (BAV) has a higher risk of developing aortic valve calcification (AVC) than people with tricuspid aortic valve. AVC in patients with BAV and TAV is known to be distinct in molecular level. But the epigenetic mechanism of AVC in patients with BAV is still undefined. So we use RNAseq technology to describe the role of long noncoding RNA (LncRNA) in the AVC process of patients with BAV
METHODS: We collected aortic valve samples of 5 patients with BAV, of which 2 have AVC and 3 of which have not. We performed RNA-seq technology on an Illumina Hiseq 2500/2000 platform to characterized all feathers of LncRNAs in BAV. Gene expression levels between groups of valves were compared with edegeR to find out differential lncRNAs. Then we predicated the target gene of LncRNA by location and expressed correlation. We performed the GO (Gene Ontology) and KEGG (Kyoto Encyclopedia of Genes and Genomes) enrichment analysis for the target gene candidates of differential lncRNAs to predict the potential function of AVC specific lncRNAs. A value of $P<0.05$ (2-sided) was considered to be statistically significant.
RESULTS: Compared with noncalcified aortic valves. We found that 24 lncRNAs were upregulated and 3 are downregulated in calcified aortic valves. the target gene candidates of differential lncRNAs were enriched in numerous Go terms including the following heparin binding, chemokine activity, chemokine receptor binding, immune response, G-protein coupled receptor binding, intracellular organelle, organelle, negative regulation of transcription. The most significantly a ected pathways identified by KEGG pathway analysis includes: renal cell carcinoma, non-alcoholic fatty liver disease (NAFLD),pancreatic secretion,HIF-1 signaling pathwa, shigellosis.
CONCLUSIONS: our study proved that lncRNAs play an important role in AVC of patients with BAV. The result may improve understanding of the special molecular alterations in AVC with BAV and may provide potential targets for future clinical applications.

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Stress methods to evaluate the risk of surgery in patients with ischemic cardiomyopathy

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BACKGROUND: The aim is to compare the early outcomes of cardiac surgeries with the results of stress and rest echocardiography and myocardial perfusion gated single photon emission computed tomography (GMPI) in patients with ischemic cardiomyopathy (ICM).
METHODS: Thirty two patients (60±6 years old) with ICM, LVEF 32±5% and LVESVI 86.3±25.4 ml/m^2 underwent dobutamine stress echocardiography (DSE) (5-40 mkg/kg/min) and myocardial perfusion gated SPECT (GMPI) with ^{99m}Tc-MIBI (two days protocol: adenosine stress / rest). All the patients underwent coronary artery bypass grafting with surgical ventricular restoration (34%) and mitral repair (40%) if indicated. During DSE, LVEF, wall motion score index (WMSI), global longitudinal strain (GLS) by speckle-tracking imaging, and the LV myocardium mass were defined. The LV contractile reserve (LVCR) and LV performance index (power/mass ratio) were calculated. Based on GMPI, LV perfusion and contractile function were evaluated. All patients were retrospectively subdivided into 2 groups: group I (N.=12) with complications in the early postoperative period (death, intra-aortic counterpulsation balloon support, inotropic support), group II (N.=20) without complications.
RESULTS: The risks of cardiac surgeries according to Euroscore II were comparable in both groups (5.1±1.6 *vs.* 5.8±1.6). According to the rest echocardiography, the groups significantly differed in LVEDVI, LVEF, LVWMSI, GLS, and the right ventricle function. However, the viability and power/mass ratio by DSE as well as preoperative perfusion param-

eters defined by GMPI showed no significant difference between the groups. Rest LVEF, stress LVEF, and LV peak ejection rate were significantly lower in group I.
CONCLUSIONS: In patients with ICM, the myocardium viability, power/mass ratio, and myocardium perfusion parameters cannot be used as predictors of early postoperative complications. The preoperative parameters of the LV volume and contractile function (according to both rest echocardiography and GMPI) allow predicting early outcomes of cardiac surgeries in patients with ICM.

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Use of veno-venous intravascular aspiration system 'angiovac' under exclusive ultrasound monitoring in 6 consecutive patients

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BACKGROUND: The veno-venous intravascular aspiration system AngioVac (AngioDynamics, Latham, NY, USA) is a promising alternative to open-heart surgical treatment useful to remove "en-bloc" fresh, soft thrombi or other embolic material. Indications, tips and contraindications are still under debate.
METHODS: We collected data from the first 6 consecutive patients treated with AngioVac system in our center.
1. abdominal malignancy with venous invasion
2. endocarditis on leads
3. atrial thrombus and pulmonary embolism
4. jugular/atrial thrombosis
5. thrombosis of the superior vena cava
6. jugular thrombosis/tricuspid endocarditis

PATIENTS underwent general anesthesia and intubation. Heparin was given and the inlet cannula was inserted percutaneously into a femoral vein under ultrasound monitoring. The 22 F aspiration cannula was inserted through the other femoral vein or the right jugular vein depending on the location of the mass.
RESULTS: Set up and monitoring were always adequately guaranteed by transesophageal echocardiography, without the need of fluoroscopy. Complete removal was achieved in patients 2. (fresh right atrial thrombus) and 3. (mobile vegetations on endocavitary leads), partial but significant removal in 4. and 5., no removal was obtained in 1. because of the stiffness of the neoplasm, and in patient 6. because of impossible positioning of the aspiration cannula. Patients 3. and 5. (totally percutaneous) didn't require a thoracic access.
CONCLUSIONS: Fresh thrombus or mobile vegetations for endocarditis on pacemaker leads represent the major indications. If thrombus isn't fresh success can be partial or none. Stiff neoplastic invasion (maybe mistaken for venous thrombus) appears not to be removable with AngioVac. Chronic thrombosis of the superior vena cava can hamper the procedure. Selection of the ideal patients remains therefore mandatory. If the procedure is performed by an heart surgeon (expert in minimally invasive techniques), into the operative room, a surgical bail out is feasible.

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Aortic arch surgery using frozen elephant trunk technique: midterm results

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BACKGROUND: The aim is to analyze midterm results of the aortic arch surgery using frozen elephant trunk (FET) technique.
METHODS: A total of 66 consecutive patients with acute (AAD), chronic (CAD) aortic dissection, and an aneurysm underwent one-stage aortic repair using FET technique between March 2012 and December 2018. The mean age of the patients was 55.2±9.8 years. Moderate hypothermia and antegrade cerebral perfusion (ACP) via the innominate artery were utilized. The proximal anastomosis of the hybrid stent graft was performed in zone 0, zone 1, zone 2, and zone 3 in 3%, 3%, 24.2%, and 69.7% respectively. The mean diameter of the deployed hybrid stent graft was 27.7±2 mm (22-40 range).
RESULTS: The mean duration of the cardiopulmonary bypass, cardioplegic arrest, lower body circulatory arrest, and ACP were 219.2±61.7 min, 139±48.1 min, 61.7±21.8 min, and 45.1±12.7 min, respectively. The incidence of permanent and transient neurological deficit was 4.5% and 3%, respectively. The 30-day mortality was 9.1%. No permanent spinal cord ischemia occurred. The distal edge of the stent graft was in T7-T12 range. Its lower edge was implanted at the T9-T12 level in 46(69.9%) cases. Cumulative survival, freedom from negative remodeling and distal aortic re-intervention at 5 years were 77.4%, 55.6%, 83.3% in patients with AAD, 78.9%, 68.6%, 71.4% in patients with CAD, and 87.5%, 100%, 100% in patients with an aneurysm, respectively.
CONCLUSIONS: The FET procedure is an effective method in aortic arch aneurysm as well as aortic dissection cases and provides acceptable midterm results.

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Arch debranching on the beating heart: choosing the right strategy for perfusion

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BACKGROUND: Beating heart aortic arch debranching (BHAAD) lets it use the aortic arch as a landing zone for an endovascular prosthesis. Compared to open arch procedures, the advantages of this hybrid approach to arch diseases are the avoidance of circulatory arrest and deep hypothermia. Nevertheless risk of excessive bleeding and subsequent hypovolemic shock is high. To perform BHAAD we used three strategies: totally off-pump intervention, on pump circulation on the beating heart, and an hybrid strategy we called "emo-volemic assistance".
METHODS: From September 2013 until May 2018 7 consecutive patients underwent BHAAD as a first step.
Cell saver was used in all patients.
Patients 1, 2, 3 and 6 were operated off-pump, heparin dose was 1,5 mg/kg: access to left subclavian artery was intrathoracic in patients 2 and 3, extra-thoracic in patients 4 and 6. Patient 5 was operated on-pump on the beating heart: right subclavian artery was used for arterial cannulation, left ventricle was vented and the patient was cooled at 28°C.
Patients 4 and 7 were operated with emo-volemic assistance: full heparinization, cannulation of the femoral vein "ready to start", used for rapid blood reinfusion from cardiotomy. No emergency arterial cannulation was necessary although significant bleeding occurring in patient 4.
RESULTS: The first step was well tolerated by all patients. Unfortunately patient 4 experienced the fatal rupture of the descending aorta just few days before the implantation of the endoprosthesis that had been scheduled 1 month after the first step.
CONCLUSIONS: The BHAAD plus endoprosthesis appears to be able to reduce complications and extend the treatment to very ill patients otherwise considered as prohibitive risk. Avoiding the arterial cannulation may help to prevent embolization of endo-aneurysm thrombus. Minimizing the time interval between the two steps can be life-saving.

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Surgical therapy timing of CABG for acute myocardial infarction

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BACKGROUND: Acute myocardial infarction (AMI) is one of the severe complication of coronary heart disease patients, the surgical therapy timing of Coronary artery bypass graft (CABG) for AMI patients is still controversy. We retrospectively reviewed and analyzed the relationship of the timing and outcome of AMI patients.
METHODS: From 2002 January to 2017 December, 211 AMI patients underwent surgical therapy in our center. We divided 211 patients into three group according to the time from the onset of AMI to operation. 56 patients (26.5%) received CABG less than 2 days, 62 patients (29.4%) were 3-7 days and 93 patients (44.1%) were longer than 7 days. The clinical characteristics, surgical methods, postoperative outcomes, and follow-up of the three groups were retrospectively analyzed.
RESULTS: The mean ages of the three groups were basically the same (66.3±4.3 *vs.* 66.7±5.1 *vs.* 69.5±9.6), and the proportion of ST-segment elevation myocardial infarction was lower in the 3-7 days group (63.5% *vs.* 54.8% *vs.* 67.7%). The proportion of cardiac shock was lower in the 7-day group (3.6% *vs.* 6.5% *vs.* 1.1%), but the ratio of ventricular septal perforation (1.8% *vs.* 1.6% *vs.* 8.6%) and combined ventricular aneurysm (0% *vs.* 1.6% *vs.* 4.3%) is higher than the other two groups. The proportion of surgery under cardiopulmonary bypass was higher in the group over 7 days (21.4% *vs.* 19.6% *vs.* 44.2%). Mortality was higher in the 0-2 day group than in the other two groups (12.5% *vs.* 9.5% *vs.* 7.5%).
CONCLUSIONS: The indications for bypass surgery in acute myocardial infarction are clear, and the timing of surgery needs to be comprehensively considered in consideration of hemodynamics and mechanical complications. There was no significant difference between off-pump CABG and on-pump CABG.

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Atrial fibrillation surgery guided by complex fractionated atrial electrogram and frequency analysis of fibrillation waves

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BACKGROUND: A surgical strategy based on structural alteration of the electrical substrates of atrial fibrillation (AF) is required to achieve better outcomes of AF surgery. Recently, it was suggested that continuous short-cycle fractionated electrical potentials recorded in the atrium (complex fractionated atrial electrogram: CFAE) may reflect the electrical substrate of AF. We performed AF surgery guided by preoperative CFAE mapping using a 3-dimensional (3D) mapping system and the frequency analysis of fibrillation waves.
METHODS: From January 2015 to August 2016, 8 patients (mean age: 66.5±6.4 years) underwent CFAE mapping-guided AF surgery. In the preoperative electrophysiological study using 3D mapping and frequency analysis of fibrillation waves. CFAE was defined by a low voltage electrogram (0.05-0.25 mV) with a highly fractionated potential (short cycle length <120 msec). A modified Cox-maze operation was performed with additional cryoablation of CFAE sites by reference to fibrillation cycle length.
RESULTS: There were 1-3 (mean: 2.5±0.8) CFAE sites in the right atrium and 2-4 (mean: 2.4±0.7) sites in the left atrium. Concomitant cardiac surgery included mitral valve plasty in 6 patients, and aortic valve replacement and mitral valve replacement in 1 patient each. At discharge, 7 patients were in sinus rhythm and 1 patient still had AF, but sinus rhythm recovered at 3 months postoperatively in this patient without anti-arrhythmic medication. After a mean follow-up of 38.8±10.5 months, all patients remained in sinus rhythm.
CONCLUSIONS: Mid-term results suggest that CFAE mapping and the frequency analysis of fibrillation waves guided atrial fibrillation surgery is feasible and effective. The fibrillation cycle length was closely related to CFAE site and CFAE site ablation might be effective to maintain sinus rhythm and favorable atrial function.

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Modified left ventricular reconstruction method for ischemic heart disease with left ventricular aneurysm

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BACKGROUND: Left ventricular aneurysm is one of the complications after myocardial infarction, and traditional surgery has certain limitations. To summarize the clinical effects and follow-up results of our center using modified left ventricular reconstruction surgery for left ventricular aneurysm.
METHODS: From January 2002 to December 2016, we performed a modified left ventricular reconstruction for 33 patients (22 males and 11 females) with post myocardial infarction ventricular aneurysm. The average age of 56.8 (48-65) years old. The preoperative ventricular aneurysm size was 62.8 mm with an average left ventricular end diastolic diameter and an average EF of 34.7%. All patients underwent a modified left ventricular reconstruction surgery, that is, after the ventricular aneurysm was opened and the boundary was defined, a suitable size of polyester sheet was lining the ventricle cavity, and the purse was sutured after suturing the border after resection. The outer layer was sutured continuously with two lengths of 3-5 cm felt strips. 25 patients underwent coronary artery bypass surgery. 18 patients underwent ventricular septal perforation repair. 13 patients underwent mitral valvuloplasty and 3 patients underwent mitral valve replacement.
RESULTS: Perioperative mortality was 9.1% (3/33), with an average follow-up of 72.9 (1-171) months. There was no death during follow-up and there was no reoperation due to mitral regurgitation. At the postoperative follow-up, the mean left ventricular end-diastolic diameter was 58.8 mm, with an average EF of 39.4%.
CONCLUSIONS: Modified left ventricular reconstruction surgery is performed at the same time as the removal of ventricular aneurysm, and the effect of left ventricular remodeling and ventricular systolic function retention is clear. Perioperative, long-term follow-up results showed satisfactory results. At the same time, revascularization does not affect the surgical outcome of this group of patients.

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Clinical experience of aortic valve surgery in aortitis patient

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BACKGROUND: Aortic valve surgery is complicated in patients with aortitis. This clinical research retrospectively analyzed the type of le-

sions, surgical procedures, and follow-up results of aortic valve surgery in aortitis patient.
METHODS: From January 2010 to December 2018, 17 patients with aortitis disease were treated in our center. Among them, there were 9 males and 8 females with an average age of 55.5 ± 6.4 years. Eight patients (42.8%) were diagnosed as arteritis and 9 patients (57.2%) were diagnosed as Behcet's disease. The mean preoperative aortic regurgitation was 3.5±0.8 (0-4) and aortic stenosis was 0.4±0.7 (0-4). The average diameter of ascending aorta was 44.0±17.0 (29-70) mm, and the mean preoperative EF was 46.7±7.0 (31-55)%. In patients with vascular inflammatory disease, aortic valve replacement is performed specifically. The annulus suture is inserted from the outside of the vessel wall, the spacer is placed outside the vessel wall, and the felt strip is reinforced on the outside of the annulus.
RESULTS: There were 2 cases of aortic valve replacement, 10 cases of aortic valve root replacement (Bentall), and 5 cases of aortic valve repair. The average cardiopulmonary bypass time was 259.1 ± 99.1 min, and the mean aortic clamp time was 183.4 ± 76.6 min. Perioperative mortality was 17.6% (3/17), with an average follow-up of 37.3 (5-90) months, and 1 patient died during the follow-up period (7.1%, 1/14). The incidence of redo surgery was 14.3% (2/14). One patient underwent redo Bentall procedure for a pseudoaneurysm of the root. One patient underwent redo aortic valve replacement for aortic valve prolapse after a surgical aortic valvuloplasty.
CONCLUSIONS: For patients with complex vascular inflammatory disease / Behcet's disease, special surgical techniques can be used to reduce the risk of prosthetic valve detachment.

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Association between packed red blood cell transfusion and clinical outcomes in patients following coronary-artery-by-pass-grafting

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BACKGROUND: The purpose of this study was to evaluate the impact of packed red blood cell (PRBC) transfusions on the occurrence of 30-day major adverse cardiac and cerebral events (MACCE) following coronary artery bypass grafting (CABG).
METHODS: In this retrospective study, we analyzed 696 patients who underwent isolated CABG between October 2014 and April 2018. The prognostic impact of PRBC transfusion on MACCE was investigated by means of multivariate logistic regression analysis and propensity score matching. In addition to that, subgroup analysis was performed with regards to the amount of transfused PRBC units. 30-day MACCE was defined as composite of 30-day mortality, myocardial infarction, stroke or transient ischemic attack.
RESULTS: Overall, 322 (46.2%) patients received PRBC transfusions with a mean of 1.6±2.44 units per patient. Multivariate analysis showed that PRBC transfusion was independently associated with increased incidence of 30-day MACCE (OR 1.19; 95% CI 1.09-1.29; P<0.001). When stratified by the amount of transfused PRBC units, the transfusion of >4 PRBC units was independently associated with increased rate of postoperative MACCE (OR 4.47; 95% CI 2.09-9.5; P<0.001). However, transfusion of ≤4 PRBC units did not increase the incidence MACCE (OR 1.06; 95% CI 0.54-2.09; P=0.84). Propensity score matching sustained these findings and showed increased incidence of MACCE associated with transfusion of >4 units of PRBC (OR 12.19; 95% CI 1.49-99.26; P=0.019), but not when ≤4 PRBC units were transfused (OR 0.99; 95% CI 0.40-2.4; P=0.98).
CONCLUSIONS: Transfusion of more than 4 units of PRBC in patients following CABG is associated with increased incidence of 30-day MACCE.

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Penetrating war cardiac and great vessels injury, surgical outcome analysis in 24 patients

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BACKGROUND: Outcome analysis of war penetrating cardiac and great vessels injury.
METHODS: Retrospective analysis of a group of 24 patients who underwent a surgery for war penetrating cardiac and great vessels injury since 7/2012 to 4/2015. Simple X ray CXR, AXR, the suspect and high possible course of the gunshot, simple 2M echo Philips just to distinguish if there pericardial effusion or no, and if suspect we follow the rule "open and see don't wait and see".
RESULTS: The mean age 33.5 ± 33.1 years, with men significantly prevailing (19 patients, 79.1%). A total of 3 injured persons (12.5%) were haemodynamically stable when admitted, 21 injured persons (87.5%) were unstable or in critical condition. All the injuries were repaired by cardiac surgeon. The injury of coronary arteries was in one . In 14 patients (58.3%) a penetrating injury of other orgns was simultaneously managed. The mean ICU stay was two days, on average 4 ± 9 units of red blood cells were administered during the in-hospital stay which lasted on average 7.1 ± 2.4 days.
DISCUSSION: A cardiac arrest, severe hemodynamic instability, unconsciousness, serious concomitant injury, gunshot injury, multiple injuries represent predictors of death in these injuries. The total mortality ranges from 16 to 25%, the presence of vital signs at the time of hospital admission is associated with 75-84% probability of survival. The surviving patients show excellent short-term results with the exception the case who suffered neurologic complication (4.1%)
CONCLUSIONS: Our experience proves a high survival rate of patients with penetrating war cardiac and great vessels injury. Treatment algorithm and a vital interdisciplinary cooperation are the key goal of successful management of these injuries. 'Open and see don't wait and see' is the rule which should be follow.

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Root management strategy in Stanford A aortic dissection

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BACKGROUND: There is no standard method for root management in Stanford A aortic dissection (TAAD) involving the aortic root. We retrospective observed the results of different surgical methods for TAAD patients and analyzed the risk factors of aortic insufficiency (AI) and aortic dilation in the midterm follow-up period.
METHODS: From January 2008 to December 2016, 427 acute Stanford A aortic dissection patients received surgical therapy were analyzed retrospectively. There were 328 male and 99 female patients, aging from 22 to 83 years with a mean age of (51±12) years. These patients were divided into two major groups: 298 cases with root reconstruction using Dacron felts and partly with aortic valve resuspension repair, 129 cases with Bentall procedure. Proper shape based on the status of dissection involvement

of Dacron patch was cut and put between the middle and outerlayer of aorta, then inside the inner layerone band Dacron felt was sutured with the aorta and the new middle layer with Dacron patch as mentioned above.
RESULTS: Cross-clamp, cardiopulmonary bypass, and circulatory arrest times of all the patients were (252±78), (173±69) and (30±9) minutes, respectively. The 30-day mortality was 7.7% (33/427), while no difference among the 2 procedures (8.1% and 7.0%). In the average follow-up time of (38±23) months (range from 0.5 to 90.0 months), survival rates were similar among the 2 procedures (82.9% and 84.5%). Only one patient received redo Bentall procedure because of severe aortic regurgitation and dilated aortic root (50 mm).
CONCLUSIONS: The indication of root management of acute Stanford A aortic dissection is based on the diameter of aortic root, structure of aortic leaflets, and the dissection involvement. For most acute Stanford A aortic dissection patients, aortic root reconstruction is a feasible and safe method.

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Clinical outcomes of the location of primary intimal entry in Stanford A aortic dissection

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BACKGROUND: Primary intimal entry is the leading cause of aortic dissection. The relationships between the location of primary intimal entry in Stanford A aortic dissection and the clinical manifestation and outcomes are not clearly.
METHODS: From January 2011 to December 2016, 476 TAAD patients (365 male, 111 female) were enrolled in this retrospective research. With the aid of Preoperative CT scan and intraoperative observing, we confirmed the location of primary intimal entry of all patients, the results revealed that 229 patients with primary intimal entry in the ascending aorta (Group As), 90 patients located in the aortic arch (Group Ar)and 157 patients in the other site or with multiple location (Group O). The clinical data and perioperative information were analyzed related to the location of primary intimal entry.
RESULTS: The ratio of hypertension was higher in the Group Ar (84.44%, P=0.06), while the ratio of Marfan syndrome was significantly lower in the Group O (0.64%, P=0.06). Cerebral malperfusion distributed differently and more predominant in Group As and Group Ar, and more patients with aortic valve regurgitation (Grade≥2) were in Group As. As different range of dissection inducing by different location of intimal entry, we have performed different surgical methods. More root replacement operations in Group Ar and more total arch replacement in Group As. With similar operative time, ICU stay was shorter in Group Ar. Mortality and morbidity were similar in all patients.
CONCLUSIONS: The clinical manifestation and clinical outcomes were different according to the location of primary intimal location in patients with Stanford A aortic dissection.

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Clinical features and surgical outcomes of acute Stanford type A aortic dissection involving coronary arteries

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BACKGROUND: Acute Stanford type A aortic dissection often involves coronary artery ostium. This article will retrospectively analyze the clinical features and surgical outcomes of this type of patients.
METHODS: From January 2011 to October 2015, 309 patients with acute Stanford type A aortic dissection received emergency surgery at our center. Among them, 40 patients were diagnosed with coronary artery opening. We used Neri classification to group the patients and statistically analyze the patient's surgery, postoperative and follow-up data.
RESULTS: Forty patients, with an average age of 49.9 ± 12.0 years. Among them, 26 cases of Neri A type (18 cases of right coronary involvement, 5 cases of left coronary involvement, 3 cases of left and right coronary involvement), 7 cases of type B (6 cases of right coronary involvement, 1 case of left coronary involvement), 7 cases of type C (There were 6 cases of right coronary involvement and 1 case of left and right coronary involvement. The mean extracorporeal circulation time, aortic occlusion time, and cessation cycle time were 297.8 ± 84.5, 210.2 ± 59.5, and 32.9 ± 11.7 minutes, respectively. The 30-day mortality rate was 20% (8/40). The mean follow-up was 24.6 ± 17.0 (1-58) months, and 4 patients died during the follow-up period.
CONCLUSIONS: Acute Stanford type A aortic dissection patients with coronary artery involvement can significantly increase operative mortality, and different surgical procedures need to be selected depending on the type of involvement.

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Minimally Invasive Hybrid Coronary Revascularisation (MIHCR) as standard, cost effective therapy using a staged approach

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BACKGROUND: A combination of Minimally Invasive CABG and Percutaneous coronary Intervention (PCI) is performed as hybrid approach to treat patients with multivessel coronary artery disease. We present our early experience using this approach.
METHODS: 38 patients with multivessel coronary artery disease (CAD) were treated by MIHCR over a 14 month period. We adopt 2 stage approach which can be perormed without the need of an expensive Hybrid Opearting theatre. Satge – 1: Minimally Invasive CABG is performed on day 0 using sinle or bilateral Internal Thoracic Artery (ITA) The patients are then loaded with antiplatelts on post op day 2 following which PCI is peformed using drug eluting stents. Angiography is routinely performed during PCI to assess ITA graft patency. Patients are usually discharged home on post op day 4 after complete coronary revascularisation.
RESULTS: Both left and right ITA were used in 8 patients and left ITA alone in the remaining 30 patients. During PCI 2 DES were inserted in 21 patients while the remaining 17 required only one stent. 9 patients in the group were high risk with Euroscore II above 5. These high risk patients stayed in hospital upto 7 days in the post operative period but had much less compliactions compared to similar patients undergoing conventional CABG. Two patients were taken back to theatre for bleeding / tamponade in the early post op period.
CONCLUSIONS: MIHCR is a safe procedure and can be considered as standard, cost effective therapy in low and especially high risk patients. In developing countries like India majority of patients with Coronary Artery Disease are between 40 to 65 years. Early recovery and getting back to work following MIHCR is proving to be a huge finacial benefit to these patients.

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Trans-apical and trans-auricular approach to mitral valve annuloplasty (animal experiments)

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BACKGROUND: Reconstruction of mitral valve is a well-known procedure in the open-heart surgery practice. The catheter-assisted endovascular approach is quite safe, however, being a not reliable procedure. Our aim was to develop mitral valve annuloplasty by a mini-invasive approach without artificial circulation.
METHODS: Animal experiments were performed with explanted pig hearts. Transapical approach suggested application of introducing device directed via cardiac apex, the receiving device should be introduced via the auricle of left atrium. Synthetic non-absorbable braided threads and a synthetic semi-ring implant were used for mitral valve annuloplasty, in order to reduce the size of mitral valve annulus, like as in routine open-heart operation.
RESULTS: Twenty experiments with explanted pig hearts were performed. Transapical implantation of artificial chords was performed with specially designed set of instruments, as it was demonstrated earlier. Suturing in the mitral valve annuloplasty was performed with modified needles, and routinely used synthetic braided threads by using special feeding and receiving devices. More than 40-50% reduction of annulus size was successfully achieved in all hearts.
CONCLUSIONS: Total repair of mitral valve insufficiency without leaflet resection can be performed by transapical and transauricular approach upon the explanted hearts.
This approach should be also confirmed in big animal models, with combined transesophageal/intracardiac ultrasound and X-ray guidance for precise puncturing the fibrotic ring and prolapsing part of the mitral valve leaflet.

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Electric muscle stimulation in patients with chronic heart failure and cardiac rhythm devices

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BACKGROUND: Whole body-electrical muscle stimulation(WB-EMS) is an alternative to traditional exercise training for patients with chronic heart failure(CHF) to improve their oxygen uptake at peak, anaerobic threshold, work capacity and Ejection Fraction. Due to lack of evidence, the use of WB-EMS in patients with cardiac devices is commonly believed to be not possible until now. The purpose of this study was to evaluate the safety of WB-EMS in patients with CHF and pacemaker or cardioverter defibrillator.
METHODS: This prospective study involved 52 patients with the mean age of 74.9±10.3 years, who were qualified for EMS between 2016 and 2018. All patients presented CHF and 80% of them could not participate conventional training due to orthopedic or neurological disorders. Eight bipolar devices were programmed into unipolar sensing and the test was repeated. Overall 60 tests were performed, 45(75%) with bipolar and 15(25%) with unipolar configuration. WB-EMS protocol included frequencies of 7-100Hz with electrodes placed on legs, arms, chest, shoulders and back.
RESULTS: We observed electromagnetic interferences(EMI) in 20% trials, however significant more with unipolar configuration(4.4% *vs.* 66.7%, P<0.05). Oversensing was the main manifestation of EMI (N. =10, 16.7%). Intermediate loss of pacing were detected in 7 cases (11.2%). Single exit block was found in one unipolar VVI-pacemaker. We did not noted any spurious shock treatment caused EMI in patients with cardioverter defibrillator. All EMI were hemodynamically insignificant and no complete loss of pacing during WB-EMS was observed. Inappropriate interpretation of heart pulse on cardiac monitor obtained in 80% of patients, however peripheral oxygen saturation was intact.
CONCLUSIONS: EMS could be safely used in patients with CHF and cardiac devices. Interferences occurs commonly in unipolar devices and have intermediate harmless nature. Individual risk assessment during the initial WB-EMS should include evaluation of patient's underlying rhythm, device specification and peripheral oxygen saturation during stimulation.

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Surgical correction of primary pulmonary vein stenosis

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BACKGROUND: Primary pulmonary vein stenosis is a rare congenital heart disease with high mortality and morbidity. We present outcomes after pulmonary vein stenosis correction.
METHODS: There were 4 patients operated from 2017 to 2018 with congenital pulmonary vein stenosis in our center. Medium age was 7.7 months (range, 6.5 - 10 months). Medium weight was 5.5 kg (range, 4-8 kg.). In 3 cases we performed sutureless operation.
RESULTS: One patient died after operation in hospital. He was admitted to the hospital in serious condition with pneumonias on a ventilator with age 6.5 months. Delayed sternal closure was performed in 2 children. Three children of 4 were discharged home from our center. One patient was admitted to our center for balloon dilatation and stent implantation in vein stenosis after suttereless technique 3 times. Another patient died after sutureless correction at home in 6 months.
CONCLUSIONS: Primary pulmonary vein stenosis still carries a poor prognosis despite adoption of the sutureless technique in the current era. Balloon dilatation and stent implantation in pulmonary vein could be necessary for correction restenosis in follow-up.

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Minimally invasive endoscopic-assisted LAD revascularization *vs.* PCI (ENPILA): early outcomes in a randomized clinical trial

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BACKGROUND: To evaluate in-hospital results of prospective RCT ENPILA (EndoACAB *vs.* PCI for LAD Revascularization)
METHODS: Our prospective RCT includes 100 patients, randomized in 2 groups: 1st group includes patients, who underwent LAD minimally invasive endoscopic-assisted revascularization (EndoACAB procedure) (N = 50), 2nd group includes patients who underwent PCI (N.=50). To evaluate the adequacy of myocardial revascularization primal endpoints

were analyzed, including major adverse cardiovascular events (MACE), such as death, non-lethal MI, recurrent revascularization; and secondary endpoints: conversion, bleeding in perioperative period, pain, quality of life. Inclusion criterion is isolated critical LAD lesions, suitable for either EndoACAB, or PCI revascularization. The study is designed using non-inferiority criteria. For the present, this trial includes 52 patients, 1st group includes 25 patients and 2nd group includes 27 patients.
EndoACAB (Endoscopic-Assisted Coronary Artery Bypass) consists of harvesting IMA with endoscopic techniques and LAD direct vision anastomosis formation through the anterolateral minithoracotomy 3-4 cm length using myocardium stabilizer.
RESULTS: EndoACAB procedure was successfully performed in all patients (100%) from the 1st group. In PCI group no complications have also occurred. There were no significant difference in primary and secondary endpoints during in-hospital period in both groups. All patients in early in-hospital period underwent coronaroangiography and shuntography. Incomplete myocardial revascularization, technical difficulties and other complications weren't detected.
CONCLUSIONS: Minimally invasive endoscopic-assisted myocardial revascularization results were comparable to the PCI results during in-hospital period.

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The effectiveness of high-volume continuous hemofiltration for CPB management

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BACKGROUND: This prospective study's goal was to determine continuous hemofiltration effectiveness for CPB management
METHODS: Prospective controlled clinical trial included 62 open-heart surgery patients with the CPB by roller pump and duration >180 min. Patient's mean age was 67±14 (min 45, max 82) 1st group (controlled, N.=29) included standard CPB, 2nd group (analyzed, N.=33) included CPB with the high-volume hemofiltration using polyionic buffered solution 80 ml/min.Hemofiltration has been also supported by ultrafiltration when hydrobalance maintenance was needed at the level of 8-10 ml/kg. Anesthesia protocol was standard;myocardial protection was administered with Custodiol® solution. Main preoperative clinical data was comparable in both groups. To evaluate the perfusion aggressiveness,following laboratory tests were made: IL-6, IL-10,WBC, PLT, procalcitonin, lactate, C-RP and metalloproteinase. Check points were before, right after the surgery and in 24 h. Presence of respiratory and renal complications, drainage blood loss, hemostasis disorders, ICU and in-hospital stay were also analyzed.
RESULTS: IL-6 level in 2nd group was significantly lower (P=0,0017) and did not exceed 7,4 pg/ml. C-RP, metalloproteinase and procalcitonin levels were lower too, but not statistically significant. Lactate level in analyzed group was in reference range, while in control group after perfusion it increased to 8,3±4,2 mmol/l. 3 patients (10,3%) from controlled group had the hemostasis disorders, while in analyzed group they did not occurred at all. Blood transfusion occurrence was the same in both groups. Renal dysfunction, requiring dialysis, was diagnosed in 6 (20,7%) patients from controlled group *vs.* 2 patients (6,1%) from analyzed group. Respiratory insufficiency developed in 3 patients (10,3%) only in controlled group. In-hospital stay was significantly lower in analyzed group - 10±1 days *vs.* 25±2 days in controlled group, and so was the ICU length - 2±1 *vs.* 4±2 respectively. Polyorganic insufficiency syndrome (POIS) occurred in 3 patients(10,3%) from the controlled group.
CONCLUSIONS: CPB management using continuous hemofiltration with polyionic buffered solution reduces the incidence of specific complications.

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Modified method for background grading of coronary artery with diffuse lesion in CABG patients

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BACKGROUND: The first aim of this study is practical significance estimation of different scoring systems in patients with diffuse coronary lesion. An assessment of new algorithm of diffuse lesion quantification is the second aim.
METHODS: 180 patients who underwent CABG in 2014 were divided in two groups. 1 group included 89 patients with diffuse lesions and 91 patients with local proximal lesions formed group 2. All patients were assessed by different scoring systems (SYNTAX Score, algorithm of diffuse coronary artery quantification according Graham M. et al. and index of diffuse lesion (IDL). IDL is calculated for each target vessel. IDL is points summing of 3 parameters: extent of atherosclerosis (0-intact vessel, 1-lesion during<10% of vessel, 2-lesion during 10%-50% of vessel, 3–lesion during >50% of target vessel or artery calcinosis), diameter of coronary lumen (0->2 mm, 1–1.5-2.0 mm, 2–1-1.5mm, 3–<1mm), blood supplying distribution (0-dominate artery, 1-balanced blood supply, 2-collateral perfusion, 3-reduced vessel zone of myocardial fibrosis). Results of CABG procedures were analyzed.
RESULTS: Clinical profile was similar in both groups without significant difference in vast majority characteristics. There was significant difference in average Graham et al. score (24,4±5,1 *vs.* 9,4±4,3 in groups 1 and 2 respectively, P<0,05). SYNTAX Score were comparable (36±3,2 *vs.* 32±2,6 in group 1 and 2 respectively, p>0,05). EuroScore values were equal in both groups (1,4±1,09 *vs.* 1,3±0,88 in diffuse and proximal lesions groups respectively, p>0,05). Graft patency as a function of IDL value were separately analyzed. The definite positive correlation has been observed between graft failure frequency and higher target vessel IDL (90% of occluded grafts had IDL value >5).
CONCLUSIONS: SYNTAX score doesn't reflect lesion diffuseness. Graham score generally reflects diffuseness overall but doesn't estimate target vessel. IDL score can reflect atherosclerotic burden of target vessel and be prognostic relevant to graft patency.

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Lifevest after cardiac surgery

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BACKGROUND: Patients with left ventricular ejection fraction (LVEF) ≤35% are at high risk for sudden cardiac death (SCD)and benefit from implantable cardioverter-defibrillator (ICD) therapy. ICD implantation is not indicated during the first 40 days after acute myocardial infarction and <3 months after coronary artery bypass grafting, because of possible cardiac function recovery.The wearable cardioverter defibrillator (WCD)is a therapy optionfor preventing sudden cardiac death at the time of recovery.This study evaluated effectiveness of the wearable cardioverter-defibrillatorin preventing SCD after cardiac surgery.

METHODS: From 02.2015through02.201826WCD patients wereretrospectively analyzed and followed-up. Patient demographics, defibrillation treatments, and daily wear timeswere retrospectively obtained from our clinical database and Lifewestnetwork.The patients were questioned about actual NYHA grade and implanted ICDat the end of follow-up.
RESULTS: Twenty-five patients (mean age 65, 22 men, 3 woman)were treated by the WCD in response toheart failure(mean EF=24%)after cardiac surgery(21 CABG, 1 AVR ,1 AVR+CABG, 1 AVR+ MVR, MVR +CABG). Average daily use of WCD was 22,1 (SD±2,7) hours which were worn 85 days (SD±35). At that time 11,96 (SD±15) events were detected but not treated, 1 defibrillationperformed, and no asystoleseen. At the end of follow-up(12months, SD±9) 20 patients were questioned. All of the patients were alive and 5(25%)of them were with implanted ICD.10 (50%)patientswere in NYHA grade I, 3 (12%) in NYHA grade II, 3(12%) between grade II-III, 2 (8 %) in grade III and 2 (8%) patients in NYHA grade IV.
CONCLUSIONS: WCD is effectivetherapyfor prevention of suddencardiac death during recovery period of heart function after cardiac surgery. It is treatment with high patient compliance.

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Results of open aortic valve valve commissurotomy compared to mechanical prosthesis in children

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BACKGROUND: To estimate outcomes of open aortic valve (AV) commissurotomy compared to mechanical prosthesis in children and adolescents with congenital AV stenosis.
METHODS: Retrospective review of 103 patients, operated in 2003-2017 with congenital AV stenosis was performed. Inclusion criteria: age 5-15 years, no previous AV intervention, significant AV gradient with no signs of AV regurgitation, annular dilation/hypoplasiaor left ventricle outflow tract obstruction.
Mean age was 11.7±2.7 years; AV gradient was 81±20.1 mm Hg, annular diameter was 19.5±2.5 mm; and mean Z-score 0.7±0.9. Surgery wasperformed through median sternotomy with moderate hypothermia. Commissurotomy had being performed in 33 patients, and 70 patients had AV replaced with mechanical prosthesis (Manouguian technic was used in 41 case). in-hospital mortality was 2.9%, all patients had AV replasement. Mean peak gradient at discharge was 26.0±10.4 mm Hg.
RESULTS: Risk factors for mortality were younger age and surgery before 2010.
AV commissurotomy was associated with younger age and significantly shorter ischemic and bypass time. Patients who had AV replasement had lower gradient at discharge, longer in-hospital stay and higher risk for non-lethal complication development.
Mean follow-up time was 4.0±2.0 years (1-10). No evident data was received about AV regurgitation increase and aortic root dilation after commissurotomy. Children after AV replacement had higher AV reoperation freedom in first 5 years after surgery. Freedom from AV replacement/re-replacement in 10 years for both cohorts was 62%.
CONCLUSIONS: AV commissuretomy as a valve-sparing technic, compared to AV replacement, could be considered as more preferred procedure in children with discrete AV stenosis. However, low reoperation freedom shows the need for more advanced surgical approaches for congenital AV stenosis are to be applied in this group of patients.

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Outcomes of 3 pledgeted sutures for repair of ischemic mitral regurgitation in patients undergoing CABG

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BACKGROUND: I am applying this paper for Young Surgeons Award. The various surgical techniques for the management of ischemic mitral regurgitation (İMR) are available at the time of coronary artery bypass grafting (CABG). We evaluated short- and mid-term surgical outcomes and feasibility of using 3 pledgeted sutures for ischemic mitral valve repair.
METHODS: Between March 2014 and November 2017, 37 patients (60.4+/-8.3 years) with moderate to severe MR (grade 3.5+/-0.5) underwent CABG with mitral annuloplasty using 3 pledgeted sutures which was placed on posterior annulus on each of P1, P2 and P3 segments. The etiology of mitral regurgitation was ischemic in all the patients. The patient's echocardiographic studies were performed during and within 3 months and 1 year after surgery.
RESULTS: In-hospital mortality was 2.7%, survival at 3 month and 1 year was 91.9% and 89.2%, respectively. Intraoperative TEE indicating 0-1+ MR was achieved in 33 patients, of which 30 patients had same degree of MR at discharge with TTE. Leaflet coaptation was 0.7+/-0.2 cm. Follow up TEE on 32 patients at 1 year showed zero to trivial MR in 9 patients, grade 1+ MR in 17 patients, 2+ MR in 4 patients, and 3-4+ MR in 2 patients. Size of left atrial decreased from 54+/-7 to 48+/-8 mm (P<0.001). Patients with severe annular dilatation (27.5%) had a greater recurrence rate (P<0.001). All patients were free of endocarditis and thromboembolism.
CONCLUSIONS: Repair of mitral valve using 3 pledgeted sutures during the CABG is feasible which achieve immediate valve competence and has long-term durability. This approach is probably more applicable for patients with lesser degree of annular dilatation and has time and cost saving benefits.

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Aortic intramural hematoma originated from endocarditis of bicuspid aortic valve

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BACKGROUND: Bicuspid aortic valve frequently leads to aortic stenosis, aortic regurgitation, endocarditis and aortic dilatation. However, Aortic intramural hematoma originated from endocarditis is very rare. Here, we report a case of ascending aortic intramural hematoma originated from aortic valve endocarditis with bicuspid aortic valve.
CASE REPORT: A 62-year-old man was referred to emergency room because of the anterior chest pain that occurred one hour before. Patient blood pressure was 90/51mmHg, pulse was 108 times per minute, and body temperature was 36.5°C. As a result of blood tests, the number of WBC was 22,180/dl(neutrophil,86%), CK-MB was 1.65ng/ml, Troponin-T was 0.322ng/ml, Pro-BNP(Brain Natriuretic peptide) was 4966.00pg/ml, CRP was 7.08mg/dl. The EKG result was sinus rhythm, and there was no ST change. 2D-echocardiography revealed a bicuspid aortic valve with aortic valve regurgitation. Chest CT results revealed hemopericardium, ascending aorta dilatation and eccentric high density lesion without enhancement along ascending aorta. Despite the suspicion of inflammatory disease of the aorta due to leukocytosis, a

suspicion of hemopericardium on CT showed a higher possibility of intramural hematoma and emergency operation was performed. Operative findings revealed intramural hematoma of the ascending aorta and endocarditis of the bicuspid aortic valve. We removed the ascending aorta, resected the aortic leaf, and performed a Bentall operation by inserting a 21 mm valved-graft. After the operation, the patient developed chylothorax, but was discharged after recovery after conservative treatment.

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TAPSE as predictor of outcomes in mitral valve surgery patients with coexisting severe tricuspid regurgitation

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BACKGROUND: Tricuspid annular plane systolic excursion (TAPSE) which reflects right ventricle (RV) systolic function longitudinally has been widely used as one of the prognostic markers in mitral valve surgery (MVS). However, in the presence of severe tricuspid regurgitation (TR), TAPSE has been known to be a confounding factor in assessing RV function. The aim of this study is to investigate the association of TAPSE as predictor of outcomes in patients underwent MVS with coexisting severe TR.
METHODS: From January 2018-December 2018, 193 patients underwent isolated MVS or in combination with severe TR underwent concomitant tricuspid valve surgery were retrospectively reviewed. All patients had TAPSE >=15mm measured by echocardiography. Postoperative mortality, complications, length of ICU and hospital stay were compared.
RESULTS: Out of 193 patients, 162 (83.94%) had isolated MVS and 31 (16.06%) had coexisting severe tricuspid regurgitation (TR). The mean age was 46.01 ±13.05 in isolated MVS and 41.97 ±11.90 in MVS + severe TR (P=0.11). Median (interquartile range [IQR]) TAPSE was 23 (19.0–27.0mm) in isolated MVS versus 21 (18.0–24.5mm) in MVS + severe TR (P=0.38), other pre-operative characteristics and comorbidities were also similar between the 2 groups (P>0.05). This study showed that mortality rate was significantly higher 9.7% versus 2.5% (P=0.04), significantly longer hospitalization (P=0.03), and significant post-operative complications (P=0.02) in patients with MVS + severe TR, however there was no significant difference in length of ICU stay between the 2 groups (P=0.27).
CONCLUSIONS: This study revealed that MVS patients with severe TR had significantly poorer outcomes in spite of similar pre-operative TAPSE >=15mm. Pre-operative TAPSE value was indeed a confounding factor in the presence of severe TR, therefore TAPSE should not been used to assess RV function and predict outcomes in MVS patients with severe TR.

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Management of acute coronary syndrome in emergency departments: a cross sectional multicenter study

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BACKGROUND: We aimed to describe diagnosed acute coronary syndrome (ACS) and its care management and outcomes in emergencydepartments (EDs) and to determine related cardiovascular risk factors (CVRFs).
METHODS: We conducted a cross sectional multicenter study that included 1173 adults admitted to EDs for acute chest pain (ACP) in 2015 at 10 sites in avellino emergency department aorn moscati hospital . Data included patients' baseline characteristics, diagnosis, treatment and output.
RESULTS: ACS represented 49.7% of non-traumatic chest pain [95% CI: 46.7-52.6]; 74.2% of ACS cases were unstable angina/non-ST-segment-elevation myocardial infarction (UA/NSTEMI). Males represented 67.4% of patients with ACS (P<0.001). The median age was 60 years (IQR 52-70). Emergency medical service transportation was used in 11.9% of cases. The median duration between chest pain onset and ED arrival was two hours (Inter quartile ranges (IQR) 2-4 h). The age-standardized prevalence rate was 69.9/100,000 PY; the rate was 96.24 in men and 43.7 in women. In the multivariable analysis, CVRFs related to ST segment elevation myocardial infarction were age correlated to sex and active smoking. CVRFs related to UA/NSTEMI were age correlated to sex, familial and personal vascular history and type 2 diabetes. We reported 27 cases of major adverse cardiovascular events (20.0%) in patients with STEMI and 36 in patients with UA/NSTEMI (9.1%).
CONCLUSIONS: Half of the patients consulting EDs with ACP had ACS. Emergency medical service transportation calls were rare. Management delays were acceptable. The risk of developing an UA/NSTEMI was equal to the number of CVRFs +1. To improve patient outcomes, it is necessary to increase adherence to international management guidelines.

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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 cm^2/m^2) 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. Thromboses of left atrium was marked at 13 (10,2 %) pts, including massive in 3 pts. 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).
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 cm^2/m^2) were marked in 21 (16,5%) pts with BSA >1,75 m^2 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 m^2, 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 m^2 it may lead for significant PPM (indexed effective orifice area = 0,93± 0,02 cm^2/m^2) and heart failure. 23 mm prosthesis may be used in pts with body mass ≤ 45 kg (BSA<1,5 m^2).
CONCLUSIONS: Pts with SCLV are in group of higher risk for operation and increasing risk of PPM.

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Mitral valve replacement with translocation of papillary muscles of anterior leaflet

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BACKGROUND: To determine the possibilities of correction of mitral valve disease (MVD) at left ventriculomegalia (LVM) (end-diastolic volume of the left ventricle ≥300 ml) by original method of translocation of papillary muscles of anterior leaflet (TPMAL) (island technique).
METHODS: Analyzed group consists of 537 patients (pts) with isolated MVD and combination with LVM were operated at period 2000-2016 yy in Institute. All pts was divided at 3 groups:1) group A (229 pts) - mitral valve replacement (MVR) + preserving of posterior leaflet of MV; group B (59 pts) MVR + preserving of posterior leaflet of MV + original method of TPMAL (island technique); group C (247 pts) - only isolated MVR without preservation of MV's structure.
RESULTS: The hospital mortality were: group A - 1,7%; group B - 1,7; group C - 3,9% (P<0,05). Data of echo for group A: end-diastolic volume (EDV) (ml): preoperative (PRE) - 331,4 ± 19,1, postoperative period (11 - th day) (POST) - 247,2 ± 21,7, remote period (RP) - 175,5 ± 23,2; ejection fraction of LV (EFLV): PRE – 0,43 ± 0,03, POST - 0,51 ± 0,04, RP – 0,53 ± 0,04. Data of echo for group B: EDV (ml): PRE - 331,2 ± 29,1, POST - 185,8 ± 23,1 , RP - 163,5 ± 17,2; EFLV: PRE – 0,43 ± 0,05, POST - 0,51 ± 0,03, RP – 0,57 ± 0,03. Data of echo for group C: EDV (ml): PRE - 337,4 ± 30,9, POST - 279,2 ± 31,5 , RP - 221,5 ± 27,8; EFLV: PRE – 0,42 ± 0,04, POST - 0,44 ± 0,03, RP – 0,46 ± 0,03.
CONCLUSIONS: Correction of MVD with preservation of valve apparatus of MV especially with original method of TPMAL (island technique) is highly-efficient intervention for pts with LVM and associated with good LV's morphometry at all postoperative period in compare with group C (P<0,05).

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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 Institute. 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%). AF was marked in all pts. All data divided at 2 groups: group A – MVR + TPLA + ligation of LA's auriculum was 128 pts and group B – 577 pts only MVR without LA's plasty or ligation's auriculum.
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 .
CONCLUSIONS: The original method of TPLA was allowing to improve better clinical results at group A than in B (P<0,05).

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Predictors of acute kidney failure after open-heart surgery on infrarenal aorta

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BACKGROUND: The question about reduction of the lethality in open surgery on infrarenal aorta remains in connection with some risks of postoperative complications (from 18% to 55%). Acute kidney failure (AKF) ranks third among them. It was decided to detect risk factors for AKF after open surgical intervention on infrarenal aorta.
METHODS: 26 patients were studied, they had been operated for Leriche syndrome and infrarenal aortic aneurysms. The results formed the basis of this work. 7 patients became the study group because they had suffered from postoperative complications with ACF. 19 patients were formed in the control group as they hadn't AKF. Nature of aorta's injury, cardiovascular diseases and previous surgeries, laboratory and instrumental results and arterial hypertension were assessed during our work. The results of research were classified on the average value scale (mean) ± standard deviation (SD). The non-parametric Mann-Whitney test was used to compare the groups. The difference in the categorical variables was also reviewed by the use of Pearson's $\chi 2$ and the Fisher index. The differences were considered statistically significant at P<0,05. Mathematical processing was conducted using software packages STATISTICA 10.
RESULTS: Reliable connection was found between increasing risk of developing AKF and a high atherogenic coefficient as indicator of broke lipid metabolism (P<0,05). All the patients were overweight in the group studied (P<0,05). Heart attack and other cardiovascular diseases were observed in a half of the patients (P<0,05). There was hypotonic hemodynamic instability during peri-operative period (P<0,05) in the study group. Bleeding was at the half of all the patients after surgery (P<0,05).
CONCLUSIONS: The results of surgical treatment considerably get worse because of AKF development, that means it is necessary to count all the risk factors, including bleeding, peri-operative hypotension and source change of myocardium. Identification of AKF predictors will allow to prevent complications.

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Transaortic correction of systolic anterior motion and mitral regurgitation with hypertrophic obstructive cardiomyopathy

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BACKGROUND: Systolic anterior motion of the mitral valve (SAM) may contribute to left ventricular outflow tract (LVOT) obstruction due to hypertrophic obstructive cardiomyopathy (HOCM) and produce mitral regurgitation (MR). We review our experience in concomitant transaortic correction of this pathology.
METHODS: 10 patients with severe dynamic LVOT obstruction due to HOCM and SAM with moderate to severe MR were operated between

2016 and 2019. All patients were subjected to transaortic Morrow septal myomectomy with Alfieri stitch procedure (Fig. 1). In two cases additional Cox-MAZE V procedure and carotid endarterectomy was performed and in 7 cases procedure was supplied by CABG.
RESULTS: Pre- and postoperative transthoracic echocardiography assessment revealed transaortic gradient reduction from 95.0±27.2 to 14.4±13.4 mm Hg and MR reduction to zero-trace level. with dramatic improvement in clinical status in all patients. Mean CPB time was 62±18 min and aortic cross-clamp time was 46±21 min. There were no perioperative mortality or major morbidity. All patients were discharged from cardiac surgery department at 7th postoperative day.
CONCLUSIONS: Resection of excessive myocardial tissue along with restriction of SAM by suturing mitral leaflets reliably eliminates LVOT obstruction and MR due to HOCM and SAM. Both procedures may be comfortably performed via aortotomy approach.

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The mitral valve regurgitation repair reliability in patients with congenital heart defects

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BACKGROUND: Valve replacement provides stable, predictable late results, but the mitral valve repair is considered preferable, when possible. The goal of the study is the results of reconstructive interventions on the mitral valve regurgitation in patients with congenital heart defects.
METHODS: During 1998-2018, the mitral valve regurgitation repair was performed in 109 patients with different congenital heart defects (excluding partial and complete atrioventricular canal, single ventricle). The age of patients at surgery ranged from 3 to 63 (15.8±5.2) years, 87 of them (79%) were under 18 years. Isolated congenital mitral lesion was in 57 (52.3%) patients. The preoperative Mitral valve regurgitation degree was mild in 35, moderate in 59, and severe in 15 patients. It was due to annular dilatation, cleft of cusp and prolapse of the leaflets. Ejection fraction before the operation ranged from 51 to 80% (64,5%±4.5), Z-score mitral valve from -0.56 to 3.53 (1.85±0.8). 74 (35%) patients were in II NYHA FC, and 35 (32%) in III-IV FC. Repair of the mitral valve was represented by valvuloplasty in 47 cases, different types of annuloplasty in 29 and multicomponent reconstruction in 33 cases.
RESULTS: 69 (63.5%) patients were examined at follow- up 6.5±4.9 (1-18) years. The age of patients was 5-68 (22.3 ± 14.1) years. Mitral valve Z-score ranged from -0.41 to 2.11 (0.71± 0.64), LV ejection fraction - 50-85% (66.9±6.1). 66 (95%) patients were in I-II FC NYHA and lead an active lifestyle. 63 (91%) patients had minimal or mild mitral valve regurgitation, 9% of patients - moderate or severe insufficiency. Survival rate and replacement freedom mitral valve was 97% and 88% respectively.
CONCLUSIONS: Mitral valve repair in patients with congenital heart defects is the procedure of choice and accompanied by good survival, high freedom from mitral valve replacement, and satisfactory functional status of patients.

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Totally endoscopic port-access atrial myxoma resection without robotic assistance

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BACKGROUND: Left atrial myxoma is the most common type of benign intracardiac tumor. Tumor resection by conventional sternotomy or small right thoracotomy is the common treatment of choice. We report our experience with totally endoscopic port-access technique without robotic assistance.
METHODS: From 1/2017 to 11/2018: 17 conscutive patients underwent operations:13 female, 4 male. Among of them: 14 left atrial myxoma, 3 right atrial myxoma; Median age: 58 ± 11 years old. Peripheral cardiopulmonary bypass was established via femoral artery, femoral veinous and right internal jugular vein. CO2 was flowed into right chest cavity. Surgical approach via 3 ports: 10 mm for the 3D camera at the right midaxillary line in the 4th intercostal space, 12 mm near the right midclavicular line in the 5th intercostal for main surgical instruments, 5mm at the anterior axillary line in the 3th intercostal for secondary instruments. Cardiac arrest used trans-thoracic Chitwood aortic clamp, antegrade Custodiol HTK cardioplegic solution administration via a needle inserted into ascending aortic.
RESULTS: 16 the operations were successful, 1patient required conversion to sternotomy because the lung was severe adherent to the chest wall. There didn't have any hospital death, 1 patient had complication of femoral arterial stenosis at the site of cannulation. Mean cardiopulmonary bypass and aortic cross-clamping time were 174.07 ± 58.62 minutes and 85.33 ± 39.00 minutes, respectively; Ventilated time: 9.66 ± 3.72 hours; Length of hospital stays: 6.8 ± 1.9 days. The mean follow-up time was 14.7 months, there were neither late hospital death nor recurrent tumor.
CONCLUSIONS: Totally endoscopic port-access atrial myxoma resection without robotic assistance can be performed safely. It could be alternative to the conventional sternotomy or small right thoracotomy approach. It has advantages of decreased postoperative pain, less surgical trauma, cosmetic benefits and greater patient satisfaction.

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Thrombembolia prevention in patients with atrial fibrillation by open-heart resection of left atrium's appendage

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BACKGROUND: Atrium fibrillation (AF) is one of the most frequent types of an arrhythmia. Acute cerebrovascular accident (CVA) develops as a dangerous complication of AF, caused by cardiac embolism. Every fifth patient with heart attack was diagnosed AF, besides 90 per sent of blood clots takes place at the left atrium's auricle (LA). It was decided to appreciate the results of resection LA auricle in open heart surgery and review the opportunity of using this method as a prevention of thromboembolic complications.
METHODS: Work based on the results of 39 patients. There were 19 patients who had resection of LA auricle among the main heart surgery. 20 patients from the control group got some heart surgery, but nobody got the removal of the LA auricle. The primary method of collecting information was a survey by phone. The survey included such items as complaints about cardiovascular system, cardiovascular events in post-operative period, opportunity of physical activity and others. The results of our research were classified on the average value scale (mean) ± standard deviation (SD). The non-parametric Mann-Whitney test was used to compare the average value groups. The difference in the categorical variables was also reviewed by the use of Pearson's $\chi2$ and the Fisher index. The differences were considered statistically significant at $P<0,05$. Mathematical processing was conducted using software packages STATISTICA 10.
RESULTS: The results showed that almost every patient take anticoagulants. However, there were 4 cases of acute CVA in the control group. 2 cases of them were fatal. There are no such complications in the group

studied. Even comparing of little groups makes it possible to identify statistically significant frequency of CVA (P<0,05).
CONCLUSIONS: A radical resection of left atrium's auricle considerably reduces a risk of thromboembolic complications with the patients who had AF after open-heart surgery.

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Aortic root re-replacement with cryopreserved aortic homograft versus composite valve-graft in patients with destructive endocarditis

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BACKGROUND: Our aim is to compare results of implantation of cryopreserved aortic homograft (CAH) and composite valve-graft (CVG) in patients with prosthetic endocarditis and aortic root destruction.
METHODS: From 2011 to 2017, we performed 23 reoperations on aortic root due to infectious complications after previous interventions on aortic valve or ascending aorta.
There were 7 cases of Bentall procedure with CVG: 5 after aortic valve replacement (AVR), 1 redo Bentall procedure and 1 after ascending aorta replacement. And there were 16 CAH implantations: 7 – after Bentall procedure, 7 – after AVR or re-AVR, 2 – CAH reimplantation.
Mean age - 49,1 years. Mean interval – 21 months. Early endocarditis in 50%, acute stage - in 87% of reoperations. Twelve patients had aortic root abscesses with extensive destructions, 7 – intracardiac fistulas and 5 – mediastinitis with a fistula on suprasternal notch. In 3 patients the infection extended around temporary pacing wires. One patient had vegetations on the internal wall of dacron graft with an embolism in right radial artery, the mechanical prosthesis was clear.
RESULTS: Resternotomy – 3 (bleeding), 1 – side thoracotomy and lung stitching (massive pneumothorax due to violent lung emphysema), 3 – permanent pacemaker implantation. Recurrent infection was in 3 patients. Overall mortality 21,7% (5 patients, and 4 of them with CVG). Mortality in CAH-group became 6,3%.
CONCLUSIONS: Active prosthetic endocarditis remains a challenging problem with high mortality either in early or in long-term period after previous aortic valve or root procedures. At reoperations it is necessary to perform full surgical debridement of all surrounding tissues involved in inflammatory process with removal of all infected implants. Allografts' shape and its implantation technique allows to apply it into destructed aortic root with deeply changed anatomy and to fill abscesses' cavities with its tissues without hemodynamic deterioration.

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A patient with infective endocarditis involving vegetation of mechanical prosthetic mitral valve

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BACKGROUND: Prosthetic valve endocarditis is associated with high mortality and reoperation rate despite diagnostic and therapeutic improvements. We present a patient with infective endocarditis involving vegetation of prosthetic mitral valve.
METHODS: A 56-year-old male was hospitalized in our clinic in November, 2018. He had undergone mitral valve replacement fourteen years ago. He had exertional dyspnea. Echocardiography showed vegetation (1.2x0.6 cm) in mechanical mitral valve annulus and dehiscence in the posteromedial of mechanical mitral valve annulus. Left ventricular end-diastolic and end-sistolic diameter, and left atrial diameter were 51 mm, 30 mm, 36 mm, respectively. Ejection fraction was 60%. Antibiotics treatment was given to patient due to infective endocarditis as long as one month.
RESULTS: The infective mechanical prosthetic mitral valve was removed. All infective tissues were excised from the periannular cavity. The vegetation material was sent for frozen examination. The frozen examination showed abundant leucocyte infiltration. New mechanical prosthetic mitral valve was replaced. The mean cardiopulmonary bypass and aortic clamping times were 150 minutes and 110 minutes.
CONCLUSIONS: Surgical manegement of prosthetic valve endocardit is remains a challenge. Surgical treatment is effective method.

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Our strategy in acute type A aortic dissection

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BACKGROUND: Type A aortic dissection carry a high risk of morbidity and mortality. We presented a 62-year old man developing Stanford type A aortic dissection.
METHODS: He had hypertension, hyperlipidemia, and was smoker. The enhanced CT revealed Stanford type A aortic dissection.
RESULTS: He was taken into operation room. Median sternotomy was performed. Access to the right atrium and right subclavian artery was obtained. Myocardial protection was achieved by direct antegrade administration of isothermic blood cardioplegia into both coronary ostia and retrogadely via coronary sinus. Proximal of truncus brachiosefalicus and left carotid artery were dissected. A 8 mm dacron tube graft was anastomosed to the left carotid artery. A 28 mm dacron tube grat was anastomosed to the proximal descending aorta with sandwich technique. Proximal portion of truncus brachiosephalicus was ligtured. Proximal of left carotid artery and right subclavian artery grafts were anastomosed to the tube graft between aortic annulus and proximal descending aorta The cardiopulmonary bypass time, cross-clamp time, selective antegrade cerebral perfusion time , and systemic circulatory arrest time were 250 min,195 min, 70 min, and 6 min, respectively.
CONCLUSIONS: Unilateral selective antegrate cerebral perfusion with moderate hypothermic circulatory arrest remains a safe strategy for cerebral and visceral protection during emergent surgical repair of acute type A aortic dissection.

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Valve sparing root reinforcement and commissure resuspension with autologous pericardial strips in type A dissection

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BACKGROUND: To analyze mid-term results of valve sparing root repair (VSRR) including root reinforcement and commissure resus-

pentation by using autologous pericardial strips for type A aortic dissection.
METHODS: From 2004 to 2019, 113 patients who received emergency operation for type A aortic dissection were included. The patients with aortic root involvement underwent either VSRR (N.=48) or Bentall (N.= 28) procedure. Patients (N.=37) without root involvement received a supracoronary graft in ascending aorta (NoR). The perioperative data, aortic valve function and survival outcomes after up to 15 years follow-up were analyzed.
RESULTS: In the entire cohort 83% patients were male and the average age was 51 years old. The median follow-up duration and range were 17 (1 - 69) months in VSRR group, 59 (2 - 183) months in Bentall group, and 37 (1 - 121) months in NoR group. Preoperatively 58% patients in VSRR group and 89% patients in Bentall group had moderate or severe aortic insufficiency. Two patients (4%) in VSRR group had postpoeratively moderate aortic insufficiency as preoperatively, while no one did in Bentall or NoR group. There was no reoperation regarding to dysfunctional aortic valve during follow up in all groups. Five-year survival was 91.0% in VSRR group, 94.5 in NoR group and 100% in Bentall group. Ten-year survival was 94.5% in NoR group and 92.6% in Bentall group.
CONCLUSIONS: VSRR and Bentall procedure for type A dissection involving aortic root with or without aortic insufficiency provide satisfied short and mid-term results similar to the patients without root involvement.

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Transit-time flow measurement for graft quality assessment in minimally invasive multivessel coronary bypass grafting

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BACKGROUND: We routinely perform minimally invasive multivessel coronary bypass grafting (MICS CABG) as an alternative to conventional procedure in low-risk patients. CT-angiographic evaluation of patients, subjected to MICS CABG has shown excellent graft patency rates. We report on transit-time flow measurement (TTFM) data after MICS CABG.
METHODS: 243 Patients were operated between 2014 and 2019. All patients were subjected to MICS CABG by small left side thoracotomy with internal mammary artery (LIMA) harvesting, proximal anastomoses and distal anastomoses performed under direct vision. Saphenous vein or radial artery conduits were harvested endoscopically. Transonic TTFM was intraoperatively used for 75 patients after protamine introduction and hemodynamic stabilization. Mean graft flow (ml/min) and pulsatility index (PI) were evaluated. 1-year CT-angiographic graft patency data is available for 28 patients.
RESULTS: Mean number of grafts was 2.6±0.5 with all distal targets accessed. LIMA to left anterior descendent (LAD) graft was used in 97.8% cases. TTFM showed mean graft flow 27.7±30.2 ml/min for LAD region, 19.8±12.2 ml/min for left circumflex (LCx) region and 25.6 ±17.2 ml/min for right coronary (RCA). PI's were 2.8±0.8, 3.1±2.1 and 2.7±1.6 respectively. There were 2 cases when TTFM results led to reconstruction of the graft (both cases LIMA to LAD grafts). CT-angiography follow-up showed that only one graft among 59 was occluded. It was saphenous vein graft to obtuse marginal artery. Overall graft patency in these patients was 98.3%.
CONCLUSIONS: TTFM has shown its proven reliability for long-term graft patency prediction. Optimal graft flow patterns and excellent 1-year graft patency rates after MICS CABG has been achieved.

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Simultaneous coronary and carotid surgery in a smoker patient with chronic obstructive pulmonary disease

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BACKGROUND: We reported a smoker patient with chronic obstructive pulmonary disease having right internal carotid artery stenosis and coronary artery stenosis.
METHODS: A 65-year old man was hospitalised in our clinic in May, 2017. He had chronic obstructive pulmonary disease,carotid artery stenosis and coronary artery disease.The angiography showed right internal carotid artery stenosis.The angiography again showed left anterior descending coronary artery segmental stenosis.
RESULTS: General anesthesia was applied. Right carotid endarterectomy was performed before coronary artery bypass grafting. A median sternotomy was made. Before the pericardium was opened, the left ITA was completely mobilised. Heparin was given in doses of 1.5-3 mg/kg, to achieve an actived clotting time of ≥300 seconds. One deep pericardial retraction suture was placed at the left posterior fibrous pericardium. Left anterior descending artery- left internal mammarian artery bypass grafting with off-pump technique was performed. Stabilisation of heart was achieved with a suction device (Octopus[4]). Due to hemodynamic instability related to interrupted flow throughout the left anterior descending coronary artery a temporary shunt was inserted for the anastomosis time. After completion of the LAD anastomosis, a tacking sutures were placed to secure the epicardium to eliminate torsion and tension on the anastomosis. The patient was discharged with antiplatelet drug.
CONCLUSIONS: Simultaneous carotid endarterectomy and off-pump coronary artery bypass graft can be performed safely.

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Ice-only guided cryoballoon ablation of atrial fibrillation: surgical approach without x-ray and 3-D navigation

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BACKGROUND: Cryoballoon ablation is one of the most straightforward and effective methods in AF treatment. However, high radiation doses are often disregarded by physicians, though cumulative risks of radiological exposure may harm both the patient and the physician. It may be extremely inappropriate to use contrast agents and fluoroscopy in some patients. In addition, utilization of cryoballoon and navigation simultaneously may trigger budget considerations. The aim of current clinical case is to demonstrate the possibility of performing cryoballoon ablation without X-Ray exposure and navigation system, using exclusively intracardiac echocardiography and the 8-pole Achieve diagnostic catheter for checking the criteria of PVI.
METHODS: A 69-year-old patient with longstanding systolic hypertension and chronic kidney disease presented paroxysmal atrial fibrillation in 2016. Drug therapy was found ineffective, so cryoballoon ablation was performed. Transseptal puncture was controlled exclusively by ICE. The delivery sheath was placed in the left atrium and the 10-pole catheter was positioned in the RV. Arctic Front Advance 28 mm Cryoballoon and Achieve 8-pole electrode 20 mm were placed in every pulmonary vein under the ICE-control.
RESULTS: Effective cryoapplications were delivered to each PV with the following parameters: LSPV closure at 42 sec, total time of exposure

240 sec (-42C), LIPV closure at 25 sec, total time of exposure 240 sec (-48C), RIPV, total time of exposure 240 (-47C), RSPV closure at 21 sec, total time of exposure 180 sec (-51C). 10-pole diagnostic catheter was replaced from RV to SVC using ICE bicaval position for phrenic nerve stimulation. PVI was confirmed by testing for entrance/exit block. The patient was discharged on the second day in a good condition.
CONCLUSIONS: Cryoballoon ablation without X-Ray exposure and 3-D navigation system may be the most preferred approach for some patients. Avoiding fluoroscopy significantly decreases further risks both for the patients and physicians.

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Surgical strategy of transcatheter tricuspid valve in valve implantation in a pacemaker-dependent patient

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BACKGROUND: The surgical strategy in pacemaker-dependent patients with endocardial right ventricular pacing during transcatheter tricuspid valve replacement is not established. A few cases describe transcatheter tricuspid valve in valve (TVIV) implantation with transvalvular device leads. Due to possible damage of right ventricular electrode and further risks of life threatening heart rhythm disorder, the placement of a non-transvalvular pacemaker electrode during TVIV is recommended.
METHODS: Current clinical case demonstrates TVIV in a pacemaker-dependent patient and an implantation of a non-transvalvular electrode with further extraction of previous endocardial right ventricular lead. A 62-year-old woman with tricuspid valve implantation due to infective endocarditis in 2005. A pacemaker DR implantation was performed because of the 3d –degree AV block in 2016. In 2018 according to clinical picture and echocardiography TVIV was recommended because of dysfunctional tricuspid prosthetic valve.
RESULTS: To avoid further risks of damaging right ventricular electrode, epicardial bipolar lead (Medtronic) was fixed to left ventricular apex with pacing threshold 2.8 V, R-wave 7mV. Further extraction of endocardial right ventricular lead, using LLD device, was performed. After predilation of the tricuspid valve with a balloon Edwards 25 mm Edwards Sapien XT 29mm prosthesis was implanted. In 5 days the dysfunction of an epicardial lead was revealed with pacing threshold >7.0 V, so BS Easytrak lead was implanted through the coronary sinus with pacing threshold 1,4V. The patient was discharged in a good condition on the 18thday after TVIV and RCT reimplantation, 14thday after lead implantation through the coronary sinus. We observed stable value of the threshold and lead impedance after 3 months.
CONCLUSIONS: The placement of non-transvalvular pacemaker leads, such as epicardial position or through the coronary sinus, may be preferable in pacemaker-dependent patients during TVIV. However, more research is needed to determine the treatment tactics for this group of patients.

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The results of valveless reconstruction of the artificial pulmonary trunk

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BACKGROUND: The aim of the study is to evaluate the results of valveless reconstruction of the right ventricle (RV) - pulmonary artery (PA) conduits, implanted for congenital heart diseases (CHD) correction.
METHODS: Between 1995-2018 years, 102 patients underwented reconstructive reoperations RV–PA conduit obstruction. All patients had undergone a previous biventricular repair CHD. Mean age at the time of conduit implantation was 5.8±3.7 years. Mean interval between conduit implantation and conduit reconstruction was 8.6±5.4 years. Indications for reoperations were multilevel conduit stenosis and/or conduit valve dysfunction with significant pulmonary regurgitation. Conduit reconstruction by synthetic or xenopericardial patch without valve or monocusp implantation was performed in 55 patients (valveless (A) group), and conduit reconstruction by xenopericardial patch with monocusp valve was performed in 47 patients (control (B) group).
RESULTS: There were 5 hospital deaths. There were no significant differences in variables of hemodynamic in groups A and B immediately after surgery. Mean follow-up was 8,7±4,1 (1,0–18,5) years. Overall freedom from reoperations and reinterventions was 88%, 57% and 57% after 5, 10 and 15 years. The major indication for reoperation after conduit reconstruction was restenosis of RV-PA conduit. Freedom from reoperations and reinterventions at 5 and 10 years after conduit reconstruction was higher in group A (100% and 88%) than in group B (86% and 31%). At the same time, in late follow-up group A, compared to group B, demonstrated higher median end-diastolic volume RV (115,3 versus 109,7, ml/m^2) and lower RV ejection fraction (45% versus 47%), but it was not statistically significant (P=0.1).
CONCLUSIONS: Implantation of monocusp valve during reconstruction is a risk factor of appearance of conduit reobstruction. But the absence of the valve in the RV outflow tract and the risk of RV dysfunction is subject for constant monitoring of these patients for timely pulmonary valve replacement.

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Valve profiles and types of heart block after Edwards Intuity sutureless bioprosthesis implantation

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BACKGROUND: Various aortic bioprostheses have been widely used in the current era. We evaluated the effectiveness of Edwards Intuity Sutureless arotic valve (Intuity valve) related with valve profiles and types of heart block occurred after implantation
METHODS: Intuity valves were implanted in 5 patients with aortic stenosis between March, 2017 and Decenber 2018. The mean age was 76.2 years, and female were 4/5. They all had 3 aortic leaflets with calcific degeneration. Their maximal/mean pressure gradients were 93.2/58.8 mmHg. Their aortic valve area was 0.58 cm2 (0.40 cm2/m2). Their cardiac rhythms were normal sinus and only one patient had 1st degree atrioventricular block.
RESULTS: There were no surgical mortalities and major complications. The size of implanted valves were 23mm in 1, 21mm in 2, and19mm in 2 patients. Postoperatively, 1 patient with preexisting 1st degree heart block experienced complete atrioventricular block and recovered sinus rhythm with left bundle branch block (LBBB) at 8th postoperative day. LBBB occurred in another case and 1st degree heart block was observed in 2 patients. LBBB and 1st degree heart blocks were fixed. The postoperative echocardiography at 7th postoperative day showed that the maximal/mean pressure gradients and aortic valve area were 20/13 mmHg and 1.0 cm2 in 19mm. 22.5/13mmHg and 1.6cm2 in 21mm, and 24/12mmHg and 1.7cm2 in 23mm valve, respectively.
CONCLUSIONS: Intuity valve was effective in terms of valve profiles. Various heart blocks caused by Intiuty valve need careful monitoring.

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NOR1 and Connexin43 play an essential role for hypertrophy in induced pluripotent stem cells-derived cardiomyocytes

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BACKGROUND: Left- ventricular pressure- overload hypertrophy (LVH) and subsequent terminal heart failure due tochronic hypertension is one of the leading causes of death inthe western world. LVH is accompanied by various cardiac molecular and cellular changes resulting in hypertrophyc cell growth. Here we aimed to establish functional induced pluripotent stem cell-derived cardiomyocytes (*iPS-CM*) as an in vitro model for left-ventricular hypertrophy and to identify hypertrophy marker on a molecular basis which are until now not described in the literature.
METHODS: iPS-CM were treated with the messenger phenylephrine (PE) for 24 and 48 hours to induce hypertrophy and to identify hypertrophy marker at the level of both gene and protein. By performing microarray analysis we found Nor1 to be the highest upregulated gene in hypertrophied cardiomyocytes. Beside Nor1, further hypertrophy-associated factors (Connexin43, Mcl-1 and Akt) were analyzed by real-time PCR and Western blot. Cell size was quantified by actin staining and fluorescence microscopy. To elaborate the role of Nor1 and Connexin43 for hypertrophic cell growth in iPS cardiomyocytes, knock-down experiments with gene-specific siRNAs were performed.
RESULTS: The treatment with PE induced a significant increase of cell size in iPS-CM. All tested factors showed a significant protein upregulation, Connexin 43 had a biphasic trend with a significant increase after 24h but not after 48h. In real-time PCR the upregulation of Nor1 and Cx43 expression were also significant. Knock-down of Nor1 and Connexin 43 expression suppressed hypertrophic cell growth.
CONCLUSIONS: Our data demonstratesthat iPS-derived cardiomyocytes can be used as a valuable in vitro Model for left-ventricular hypertrophy. We further show for the first time that the orphan receptor Nor1 and Connexin43 had anessential role for hypertrophy in iPS-CM. Targeting of Nor1 and Connexin43 might be useful to inhibit cardiac hypertrophy.

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Initial results of total arterial revascularization using only composite bilateral internal mammary artery 'Y' grafts

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BACKGROUND: A composite BIMA graft in Y configuration allows full revascularization without any other graft material. This method although well described, has found routine application in our hospital only in the last years. This study analysed perioperative and early outcomes of patients who underwent BIMA grafting with a composite Y configuration.
METHODS: From our operative records 62 patients were identified, who underwent total arterial CABG surgery with BIMA grafts in Y configuration as the only graft material from 2016 to 2018. Patient preoperative, intraoperative and pre-discharge data were analysed to assess the safety and early results of this procedure.
RESULTS: In all patients, full myocardial revascularization was achieved with an average of 3.1 coronary artery anastomoses per patient. Mean patient age was 66.9±9.2 years, 16.1% had diabetes, 17.7% had left ventricular ejection fraction lower than 50% and 33.9% of patients have had a previous MI. Despite the sick patient population we observed no perioperative and intrahospital mortality in this initial series. Sternal wound infection was observed in 4 patients (6.5%).
When we divided the patient population into two groups – first 30 patients and the subsequent 32 patients we observed a decrease in overall operation time from 214.6±38.4 min to 193.3±44.7 min P<0.05 suggestive of a certain learning curve. Yet we did not observe a significant change in aortic cross-clamp times (63.0±21.1 min and 61.9±17.9 min; P=0.83) or total CPB times (78.4±27.6 min and 74.7±18.4 min; P=0.55).
Conclusions: Full myocardial revascularization using only BIMAs can be achieved with good safety results in most patients. Relatively high sternal wound infection rate suggests that more stringent patient selection has to be considered, if possible avoiding BIMA harvesting in obese diabetic patients. There is a certain learning curve mostly affecting the BIMA harvesting and Y anastomosis formation skills.

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Borderline aorta and complex aortic anatomy in transcatheter aortic valve implantation: approach and management

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BACKGROUND: Although established as a safe treatment option for high-risk or inoperable patients with aortic stenosis, transcatheter aortic valve implantation (TAVI) can be associated with rare, but serious complications such as valve migration and embolism. We present our experience regarding device embolization into the ascending aorta and successful management without surgery.
METHODS: A 65-year-old female patient with previous coronary artery bypass surgery 15-years before, patent mammary artery on left anterior descending and percutaneous angioplasty of the right coronary artery, was diagnosed with severe aortic stenosis with symptoms of progressive dyspnoea and exertional angina. Computer tomography allowed planning for transfemural TAVI, despite incidental finding of left aortic arch with aberrant right subclavian artery and significant aortic angulation. Aortic root measurements and area of the virtual basal ring revealed a borderline aorta. Using the commander delivery system via 14 French femoral sheet, a 23 Edwards Sapien 3 valve implanted.
RESULTS: Post-deployment evaluation revealed moderate paravalvular leak. Post-dilatation was performed, followed by upward migration of the valve and embolization into the ascending aorta. By keeping the extra-stiff wire in place to prevent inversion, the embolized valve was retrieved and positioned in the descending thoracic aorta with an overinflated balloon. A 26 Edwards Sapien 3 valve was deployed using an underfilled balloon during rapid pacing. Transoesophageal ecocardiography and aorta angiography showed appropriate valve positioning and no paravalvular leak. Uneventful postoperative course allowed discharge one week later and one-month follow-up revealed improvement in functional capacity.
CONCLUSIONS: Patients with borderline aorta and complex aortic anatomy present a higher risk for technique-related complications such as migration and device embolization, but proper intraoperative management ensures that the patient's long-term outcome is not impaired.

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Ventricular septal rupture repair plus coronary artery bypass grafting surgery: Aasim's experience

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BACKGROUND: Ventricular Septal Rupture Repair with Coronary Artery Bypass Grafting (VSR+CABG) surgery poses a peculiar challenge, well known to every experienced Cardiac Surgeon. I want to share my successful experiences of cases operated for VSR + CABG first time in history of Afghanistan in Amiri Medical Complex Kabul, and Medical Teaching Institute-Hayatabad Medical Complex (MTI-HMC) Peshawar, Pakistan.
METHODS: All the patients operated by Dr. Muhammad Aasim for VSR + CABG in Amiri Medical Complex Kabul, and Hayatabad Medical Complex Peshawar Pakistan, from July 2016 to end of January 2019 are included in this study. Median Sternotomy approach was adopted, using conventional surgical instruments on Cardiopulmonary Bypass. Dacron patch and Teflon felt were used for the repair of VSR (infarct exclusion technique), while Left internal Mammary Artery (LIMA) to Left Anterior Descending Artery (LAD) graft was preferably achieved in grafting the coronary vessels. Data of the patients were recorded prospectively in the dedicated computer in MS-Excel format.
RESULTS: Total of more than 07 Patients were operated for VSR + CABG by Dr. Muhammad Aasim in the mentioned time period. All the Surgical Patients received quality surgical treatment as per standard protocols and have very good outcome, with acceptable morbidity and mortality.
CONCLUSIONS: Complex Cardiac Surgery for Ventricular Septal Rupture Repair with Coronary Artery Bypass Grafting can be conducted safely, by young properly trained Cardiac Surgeons, even in the deprived parts of the world having very limited resources.
KEY WORDS: Cardiac Surgery, VSR + CABG.

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Complication management following transcatheter aortic valve implantation - contained annular rupture and ventricular septal defect

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BACKGROUND: Ventricular septal defect is a rare complication with uncertain clinical significance described following transcatheter aortic valve implantation (TAVI). The mechanism of occurrence is related to annular rupture, balloon injury to the perimembranous septum, valve oversizing, extensive calcification with eccentric calcified annulus or left ventricle outflow tract calcifications.
METHODS: A 79-year-old man with a history of chronic obstructive pulmonary disease Gold III Classification, peptic ulcer disease and upper digestive tract bleeding, coronary artery disease, percutaneous angioplasty with drug-eluted stents on circumflex and right coronary artery, presenting with progressive heart failure symptoms was diagnosed with severe aortic stenosis and referred for TAVI. Computer tomography allowed planning for transfemural approach, while aortic root measurements revealed narrow sinotubular junction and severe clacifications extending in the left ventricle outflow tract.
RESULTS: A 23 Edwards Sapien 3 valve was implanted via femoral approach. Post-deployment evaluation revealed moderate paravalvular leak requiring postdilatation. Despite reduction of paravalvular leak, a small (<8mm)contained periaortic hematoma was noted. Initial continuous TEE monitoring and serial follow-up TEE showed no signs of pericardial effusion , followed by regression of the periaortic hematoma, the patient was discharged 2 weeks later. At one month follow-up the patient showed improvement in functional capacity despite persistence of mild paraprotetic leak and complete resolution of periaortic hematoma. In addition, a restrictive subaortic ventricular septal defect was discovered and managed conservatively.
CONCLUSIONS: Particular disposition of extensive annular calcifications can lead to contained annular rupture and associated periaortic hematoma during balloon-expandable valve implantation, that can later progress to perimembranous ventricular septal defect.

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Hypertrophied myocardium protection in aortic valve surgery

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BACKGROUND: The myocardial hypertrophy represents challenging condition for heart protection. The aim was to determine the efficiency of isothermal blood cardioplegia under mild to moderate hypothermia for myocardium protection in aortic valve surgery.
METHODS: The study included 86 patients operated for prosthetic aortic valve repair, the mitral valve plasty with or without intervention on tricuspid valve and aortal cross-clamp 100-170 min. 41 patients had systolic LV mass index ≥150g/sq.m. (Gr.1); 45 - <150g/sq.m. (Gr.2). Blood cardioplegia (Calafiore) modified by us, supplemented constantly with Mg++, was applied in coronary ostia every 20-25 min. Cardioplegia temperature, identical to that of the patient, varied between 30°C and 33°C. The clinical status of patients with no significant differences between groups.
RESULTS: After aortic clamp release Gr.1 demonstrated a capacity to restore rhythm similar to that of gr.2. Out of 41 patients, the heart in Gr.1 restarted spontaneously in 29 (70.7%). Cardioversion required 12 patients (29.2%), total number of defibrillation being 15. In Gr.2 of 45 patients 13 (28.8%) required 16 defibrillations. AV block was expressed identical in both groups. The need in catecholamine was the same. In Gr.1 8 patients (19.5%) required high doses inotropic support and in group II - 9 patients (20.0%). Duration of stay in the ICU was 2,8±0,9 days for the Gr.1, versus 2,6±0,8, Gr.2.
CONCLUSIONS: Isothermal intermittent blood cardioplegia under mild or moderate hypothermia constantly supplemented with Mg ++ provides good protection of hypertrophied myocardium over a standard period (20-25 minutes) of ischemia between reperfusions and has a positive effect on functional capacity in the immediate postoperative period.

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Single center experience of chinese occluders usage for percutaneous Atrial Septal Defects (ASD) closure

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BACKGROUND: This study was designed to assess efficacy and safety of Chinese devices clinical usage MemoPart Occlusion Devices (Shanghai Shape Memory Alloy Co.,Ltd.;) and LifeTech (LifeTech Scintific Co., Ltd).
METHODS*:* From December 2011 to January 2019 2014 714 patients of mean age 23,5±27,6 years had percutaneous ASD closed with 718 devices Chinese origin (249 pts with LifeTech devices and 465 with MemoPart devices). 24 pts had multiple ASD, 4 of them were occluded with two devices. 27 pts had radiofrequency ablation (RFA) for supraventricular tachycardia (SVT) six month before procedure.

RESULTS: The rate of successful implantation was 99% (708 patients). The reason for the procedure failure was deficient aortic and one posterior rims in the same patient. Follow-up period is from 2 month to 84 months (mean 56). The rate of procedural sequelae was 2,9%. 5 pts (0,7%) had major sequelae, 3 of them had device migration to right ventricle, 1- to the left ventricle with surgical device retrieval and one erosion following six months after procedure. No death was recorded in follow-up. 19 patients had transient rhythm disturbances in early period post implantation (6 of them related to device oversize or device reposition) that were treated successfully with pharmacotherapy. In 4 cases procedure was postponed due to the new onset of SVT, all had RFA before. There was one case of a retroperitoneal hematoma required laparotomy.
CONCLUSIONS: Chinese devices could be successfully used as safe and lower cost, but not less effective alternative (in comparison with Amplatzer devices) treatment of congenital heart defects. For confirmation, a randomized controlled trial with more patients and a longer follow-up period is warranted.

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Misdiagnosis of acute Stanford type A aortic dissection in emergency department: impact on early outcome

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BACKGROUND: Acute Stanford type A aortic dissection (AAD) is a life-threatening cardiac surgery emergency requiring immediate diagnosis, therefore delay of treatment is associated with significant mortality increase. Diverse clinical manifestation of AAD often mimics other conditions, thus correct diagnosis is challenging. Previous studies show that misdiagnosis in emergency department (ED) occurs up to 39% of all cases. Aim of study was to determine the impact of misdiagnosis during admission to ED to early outcome of surgically treated patients with AAD.
METHODS: Study population consisted of 39 patients with AAD admitted to our institutions ED from January 2006 to December 2018. Misdiagnosis was considered if AAD was not included in differential diagnosis or if chest computed tomography or echocardiography was not performed as initial diagnostic tests. Transferred patients (N.=43) and patients with iatrogenic AAD (N.=2) were excluded from study.
RESULTS: Mean age of study population was 55.3 years (SD±16.0 years) and majority of patients were males (71.8%). Initial misdiagnosis in ED was made in 53.8% of cases (N.=21) and most common misdiagnosis was acute coronary syndrome, initially diagnosed in 10 cases. Chest pain was present in 71.4% in misdiagnosed and 94.4% in correctly diagnosed patients (P=0.071). Postoperative complications occurred in 50.0% of misdiagnosed and 43.8% of correctly diagnosed patients (P=0.485). Furthermore, postoperative bleeding was also more often seen in misdiagnosed (35.0% versus 12.5%) compared to correctly diagnosed patients (P=0.125). Intrahospital mortality was slightly higher in misdiagnosed patient group - 28.6% and 22.2% respectively (P=0.468).
CONCLUSIONS: Misdiagnosis of AAD occurred in more than a half of ED admissions and it was associated with higher overall postoperative complication rate as well as postoperative bleeding rate. Furthermore, misdiagnosed patients had higher intrahospital mortality, however we emphasize that larger study sample is needed to reach statistical significance.

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Reoperations and late complications following ascending aorta surgery in Marfan patients

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BACKGROUND: This analysis was performed to evaluate incidence and causes of surgical interventions in primarily nontreated aortic segments after previous aortic root and ascending aorta replacement in patients with Marfan syndrome.
METHODS: We reviewed 235 patients with Marfan Syndrome undergoing interventions on the ascending aorta at our Center from 1983 through 2018. The mean patient age was 31,7±10,5 years; 61,3% were male. About half of operated patients had aortic dissection. All patients discharged from the hospital were divided into two groups. The first group included 155 patients without dissection of distal aorta, and the Group II – 57 pts. after corrections of DeBakey type I aortic dissection.
RESULTS: The mean follow-up period was 10,5±5,6 years (range: 1–35 years). In the long-term period, 13 aorto-related deaths were noted. In the I group, 4 patients died from dissection and rupture of the distal aorta, and 9 in the II Group. Survival was significantly different between groups: 57,2% and 29% at 25 years. 47 discharged patients had late aorto-related complications and 29 of them had late aortic procedures for progressive disease or dissection. Freedom from aorto-related complications from the side of the residual aorta was 82,5% and 12,4% at 10 years in the I and II Groups respectively. According to multivariate analysis dissection type I was the only significant risk factor for aorto-related complications and reoperations in the long-term period P=0.0001.
CONCLUSIONS: Reoperations on the distal aorta are more often required for patients with theDeBakey type I aortic dissection and a larger diameter of the residual aorta. Expansion of the initial intervention on the arch of the aorta can be recommended to such patients provided it is possible to safely perform it. Careful postoperative observation of patients with Marfan syndrome is necessary for the timely detection of asymptomatic aortic changes requiring surgical correction.

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Occlusion of the left subclavian artery as a reason of angina pectoris recurrence after CABG

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BACKGROUND: Angina pectoris after coronary artery bypass surgery (CABG) usually occurs due to progression of atherosclerosis in non-grafted coronary arteries (CA), development of stenosis in graft, dysfunction of anastomosis. We had 2 clinical cases of angina recurrence for patients after CABG due to occlusion of the left subclavian artery.
METHODS: for symptomatic patients after CABG we performed c ECG, ECHO study and coronary angiography.
RESULTS: patient B., 73 y.o. was admitted to the Institute in 2 years after CABG with signs of angina pectoris II functional class CCS. Blood pressure (BP) on the right hand was 140/80 mmHg, on the left hand - 110/70 mmHg, hypoxia of anterior-septal wall of left ventricle was found on ECG, hypokinesis of anterior wall of left ventricle (LV) and decrease of EF 49% was on ECHO study. On coronary angiography: venous grafts to RCA, OM LCA were good, but graft LIMA to LAD functions retrograde, occlusion of proximal portion of left subclavian artery > 1cm. Subcla-

vian carotid-artery bypass surgery with anastomosis using the synthetic prosthesis between the left subclavian artery and the left common carotid artery was performed.

Patient C., 52 y.o. was urgently admitted to ICU with unstable angina IV class CCS in 2.5 years after CABG. BP on the right hand was 155/95 mmHg, on left hand - 140/90 mmHg. On angiography: venous grafts to PDA, PLB RCA were good, but occlusion of left subclavian artery led to reversible flow in LIMA.

CONCLUSIONS: this cases show possibility of angina pectoris recurrence as a result of occlusion of left subclavian artery. We recommend to perform angiography of LIMA before coronary revascularization. In the case of the significant difference of arterial blood pressure on hands we advise to carry out ultrasound of subclavian artery for exclusion of steal-syndrome.

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Comparison of immediate results of left atrial and classical maze III procedures

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BACKGROUND: To evaluate the immediate results of the left atrial maze procedure as compared to classical maze III procedure.

METHODS: From Oct 2012 to Dec 2016, 217 pts underwent a classical maze III procedure - group 1. From Jan 2017 to Dec 2018, only the left atrial maze has been performed- group 2 (176 pts). Preoperative status of patients significantly did not differ in two groups. The average diastolic size of the left atrium was 6.2 ± 1.4 cm, EF 46 ± 10.8%. The duration of AF before surgery was 43.2 ± 35.2 months. Most patients had permanent form of AF. Concomitant procedures were: valvular correction, CABG, combination and others. Average period of observation (group 2) 4.9 ± 2.3 months. ECG, Holter monitoring data, ECHO-data, need for repeated RFA interventions, pacemaker implantation, SF-36 questionnaire were evaluated.

RESULTS: The 30-day mortality was 3.7% (8 patients) in group 1 and 2.8% (5 patients) in group 2. We have significant differences in pump and aortic occlusion time and permanent pacemaker implantation between two groups. Data at the end of hospital stage (group 1): the restoration of sinus rhythm 151 (72.2%) pts, AF – 15(7.2%) pts, other rhythm disturbances- 23(11.0%) pts, pacemaker implantation - 20 (9.6%) pts. Data at the end of hospital stage (group 2): the restoration of sinus rhythm 135 (78.9%) pts, AF – 9(5.3%) pts, other rhythm disturbances- 14(8.2%) pts, pacemaker implantation - 13(7.6%) pts. During observational period in group 1 repeated RFA – 9(3.3%), embolic events – 4(1.6%) pts and in group 2 – 5(2.9%), and – 2(1.2%) pts respectively.

CONCLUSIONS: Isolated left atrial intervention in the treatment of AF shows good efficacy. The main predictors of the failure of the procedure are the duration of AF and the size of the LA ($P<0.05$).

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Is the occurrence site of the dissection in ascending aortic aneurysm related to wall degradation?

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BACKGROUND: Dilatation of the aortic root is an important risk factor of aortic dissection. Indeed, 60% of non-syndromic patients with a Stanford type A dissection have aortic diameters of >50 mm. Whether due to an inherent instability of the aortic wall or an acquired condition, compromised aortic integrity is a fundamental component of the underlying pathology of aortic dissection. Although the specific etiology of dissection formation is still unclear, the progression of aortic dilatation probably results from a combination of hemodynamic stress, aortic injury, chronic inflammation, genetic propensity, and epidemiologic risk factors. In clinical practice, the intimal tear occurs always in the non-coronary side of the ascending aorta. Here, we investigated the composition of all the circumference of the ascending aneurysmal wall.

METHODS: Twelve pieces will be performed from ten ascending aortic aneurysm ring biopsies, as the twelve watch dials, to localize potential modifications in aortic wall components and structure. Histological sections were stained to visualize and quantify elastin fibers, wall thickness and smooth muscle cells in the media.

RESULTS: The thickness of the aneurysmal wall was significantly increased around the section seven corresponding to a non-coronary side of the ascending aorta. Semi-quantification of elastin fibers in the media showed a significant decrease at the same section seven while the amount of smooth muscle cells was also significantly decreased at this level.

CONCLUSIONS: The general structure of the ascending aneurysmal wall shows modifications related to location with significant higher degradation in the non-coronary area. This instability could be involved in the development of intimal tear leading to aortic dissection.

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ECG diagnostic of myocardial bridges

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BACKGROUND: Location anomaly of coronary arteries, so called myocardial bridge (MB) first was described by Reyman in 1737. According to the literature, anomaly frequency on autopsy varies from 7% to 85%, while on angiography just 0.5%-12%. We have identified an informative ECG signs that allow us to suspect the presence of MB.

METHODS: We have diagnosed and treated 355 symptomatic patients with MB.

RESULTS: ECG data, angiograms and intraoperative findings were compared. 330 (92.9%) patients had sinus rhythm, 15 (4.2%) had atrial fibrillation, atrial fluttering appeared in 6 (1.6%) and 4 (1.1%) patients had rhythm migration. The heart rate range was 43 to 169 beats per minute with average of 68. For 281 of patients (79.1%) we noticed left ventricular (LV) hypertrophy, 329 patients (92.6%) had different signs of chronic coronary insufficiency. In 27 cases (7.6%) left bundle branch block (LBBB) was founded. In 71 patients (20%) we found focal changes in the anterior wall of LV. 18 patient (5.07%) had acute ischemia, 3 (0.84%) patients had acute Q-MI, 61 patients (17.1%) had ruptures. Ruptures localization were as following: 29 (47.5%) on anterior-septal wall of LV, 21 (34.4%) on the posterior wall of LV and 11 (18.03%) on apical-lateral area of LV. The implementation in practice intracoronary provocative tests with Isosorbide dinitrate has improved the diagnosis of MB at 75.7%. In 218 (61.4%) patients during the reception of nitrate, a significant increase in attacks of angina pectoris and occurrence of ischemic changes on ECG was noticed.

CONCLUSIONS: The transient change in the depth of inverted T wave in left precordial leads was noticed due to the dynamic nature of compression of the coronary artery.

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Aotic diseases fixed with 'pediatric occluders'

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BACKGROUND: We are presenting six cases of aortic disease management with pediatric devices.
METHODS: Our group consisted of 6 patients: 3 of them had ascending aortic pseudoaneurysms at the needle site following valve surgery, 1 - had coarctation with collateral network aneurysm, 1 - after Bental procedure with fistula to RA, 1 with large type I b endoleak following supracoronary aortic replacement.
RESULTS: The first case of aortic pseudoaneurysms was successfully treated percutaneously with 12 mm ASD device. In second case of ascending aortic pseudoaneurysm was managed with 10 mm pmVSD asymmetric device and 5 mm ASD device 6 month after procedure due to the leak at the site of asymmetric disk.The third patient was managed with 16 mm ASD device. But angiography showed new entry site to the pseudoaneurysm and aneurysmal sack to right atrium shunt also appeared. The patient was regarded to have infective endocarditis and was converted to surgery.
One patient had stenting of coarctation with simultaneous closure of collateral network aneurysm. The feeding vessel was occluded with the couple of coils and then entry site of the aneurysm was occluded with pmVSD device.
One man had Bental procedure more than ten years ago with the graft wrapping with the native tissue, distal suture line incompetence and surgically created fistula from native tissue sack to the right atrium. The entry site to the sack was managed with 12-14 mm PDA occluder then fistula to the right atrium was closed with 10 mm PDA device.
The last patient was unlucky to have large type I b endoleak following supracoronary aortic replacement, elephant trunk and TEVAR procedures. The proximal to the stent-graft fenestration was closed with 6 mm ASD device with good result.
CONCLUSIONS: Pediatric devices are a good solution in selected patients with aortic diseases.

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Effect of intraoperative hemoadsorption on postoperative sepsis in patients with mitral valve endocarditis undergoing surgery

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BACKGROUND: Mitral valve surgery in patients with infective endocarditis is associated with high morbidity and mortality, due to postoperative septic multiorgan failure. Intraoperative hemoadsorption (IOHA) therapy may improve outcome by reducing circulating cytokines. We aimed to evaluate the clinical effects of IOHA in patients undergoing surgery for mitral valve infective endocarditis.
METHODS: Between January 2014 and July 2018, 58 consecutive patients with acute infective endocarditis of the native mitral valve were operated. IOHA was applied in 30 patients and was compared with 28 patients without IOHA. The primary endpoints were the incidence of postoperative sepsis and sepsis-related death. Secondary endpoints included overall in-hospital mortality, need for postoperative catecholamines and ICU-stay.
RESULTS: The two comparing groups showed no differences in preoperative baseline patient characteristics, hemodynamic instability or the levels of inflammatory parameters. Postoperative sepsis occurred in 5 patients with IOHA and in 11 patients without IOHA (17% versus 39%, P=0.05). No sepsis-related death occurred patients who received IOHA, while 5 septic patients without IOHA died (0% versus 18%, P=0.01). Overall in-hospital mortality was 3 (10%) in patients treated with IOHA versus 5 (18%) in patients without IOHA, P=0.39. Postoperative need for catecholamine's was reduced in patients with IOHA (0.18 (0.08-0.22) µg/kgbw/min versus 0.24 (0.12-0.50) µg/kgbw/min, P=0.009. Median ICU-stay was 5 days (IQR 2-11) in both groups.
CONCLUSIONS: IOHA significantly reduced the incidence of postoperative sepsis or sepsis-related death. Additionally, the need for postoperative vasopressors was significantly lower in patients with IOHA. Overall in-hospital mortality was lower in patients who received IOHA; however, it did not reach statistical significance. These data suggest that IOHA holds promise to improve outcome in patients with mitral valve endocarditis.

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Cardiac Kawasaki disease: a life-long challenge

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BACKGROUND: Kawasaki disease is very rare in Western Europe. The disease may involve coronary arteries and aneurysms are typical. Recurrent myocardial infarction and ischemia may result even to end-stage heart failure.
METHODS: The case of a 39-years-old man with cardiac Kawasaki disease is presented.
RESULTS: The patient underwent coronary bypass grafting at the age of 9 years. Twelve years later the patient developed progressive heart failure (ejection fraction10%) and was evaluated for heart transplant. Before listing for heart transplant a biventricular pacing was initiated (a new modality at that time) and cardiac function improved significantly. Over the years many surgeries of cardiac device performed resulting in five intracardiac electrodes. However, 16 years after initial device implantation, the patient developed endocarditis. Therefore, the device with the electrodes was explanted but some electrode fractions remained within the heart. After implantation of a new device nine months later, again endocarditis developed. Finally, open heart surgery resulted and infected leads were removed. The preoperatively suspected tricuspid valve was not affected. Three weeks later a combined approach (epicardial and transvenous) was applied for implantation of the leads of a new resynchronization device. There is no evidence of recurrent endocarditis since then.
CONCLUSIONS: Management of cardiac Kawasaki disease is challenging. Highly specialized life-long follow-up is mandatory for optimal treatment and for management of serious complications.

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Preparation for CABG as one of the factor of successful result

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BACKGROUND: To estimate quality of preparation patients for CABG on operation result.

METHODS: We analyzed 1187 patients admitted to the department for isolated CABG.
RESULTS: Male dominated group (1166 males (98.2%) over 21 females (1.8%)) at average age 65 y.o. 225 patients had unstable angina pectoris. 826 pts (69.5%) had myocardial infarction in anamnesis. 785 patients (66.1%) patients received double antiplatelet therapy (DAPT), 120 (10.1%) patients received clopidogrel, 12 (1.01%) – warfarin. For 1123 pts (94.6%) we performed off-pump CABG. Intraoperative blood loss on DAPT was 250-750 ml (average 450 ml) while in case of antiaggregants' timely cancellation 150-400 ml (average 200 ml). Intraoperative blood transfusion had 2 pts (0.1%), rethoracotomy had 10 pts (0.8%). Only 847 patients (71.3%) received b-blockers, while other patients cancelled with DAPT all medication. Average level of total cholesterol was 4.6 mmol/l and triglycerides 1.6 mmol/l. Statins used 790 pts (66.5%). It's important to perform gastroscopy with HP-eradication therapy before CABG to prevent gastric bleeding. 397 patients (33.4%) had gastroduodenal ulcers in anamnesis and 64 (5.39%) had acute gastric ulcerative process. In the case of unstable hemodynamic and subocclusive lesions of coronary arteries massive therapy with proton pump inhibitor (Pantoprazole) was prescribed. Carotid stenosis screening helps to avoid neurological complications. Anesthetic management depends on the severity of carotid stenosis. 592 patients (50.1%) had different levels of carotid stenosis, among them: 11 pts (1.8%) had 100% occlusion of carotid artery, 217 pts (18.2%%) more than 50% stenosis, 364 pts (61.4%) – less than 50% stenosis. While 80 pts (13.5%) had stroke in their anamnesis, 2 patients (0.8%) experienced postoperative stroke. Additive Euroscore - 4, logistic - 9.2%, while hospital mortality was 8 pts (0.6%).
CONCLUSIONS: Proper preparation for surgery helps to avoid complications in perioperative period and much improve future quality of life for patients.

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Direct right axillary artery cannulation as safe and effective strategy during aortic surgery procedures

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BACKGROUND: Axillary artery cannulation is, nowadays, the gold standard strategy for arterial cannulation during aortic surgery procedures. The choice of the cannulation technique, however, is still debated as both direct cannulation (DC) and indirect (with the interposition of a dacron graft tube) cannulation (IC) have potential favorable aspects. Here we report our extensive experience with DC of axillary artery cannulation and also the preliminary results of a randomized comparison between two techniques.
METHODS: Since 2007 DC of axillary artery has become our standard approach in aortic surgery or complex REDO procedures. Data from our first 100 consecutive patients have been retrospectively analyzed. Further 50 patients were prospectively enrolled and randomized to receive axillary DC or IC. Major and minor local complications, conversion to other cannulation strategy, technical problem during cardiopulmonary by pass time, stability of cerebral perfusion and NIRS monitoring were evaluated and (in the second part of the study) compared between two techniques.
RESULTS: Part I: CPB management using axillary artery DC was satisfactory in all cases. 6 patients presented temporary NIRS abnormality which resolved spontaneously. Out of 100 patients no major complications related to the site or the technique of the cannulation were recorded. Local minor and transient complications were reported in 6 patients (6 %).
Part II: As far as the comparison between two techniques, overall 2 patients required conversion to other site of cannulation (1 each group). Temporary NIRS abnormalities were reported in 6/25 patients (all from IC group) and disappeared in 5 patients following distal axillary artery clamping. 1 patient (IC group) required surgical access re-exploration for bleeding.
CONCLUSIONS: Our experience clearly shows as direct axillary artery cannulation is a safe, effective and reproducible technique for arterial cannulation during complex procedure. Interposition graft technique may cause "relative" antegrade low perfusion when distal flow is allowed.

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Symptomatic huge thrombus of the ascending aorta

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BACKGROUND: Primary aortic mural thrombus is an uncommon pathology. It is a potential source of embolism.
METHODS: This is one case report about huge mural thrombus of the ascending aorta. Mode of presentation was acute mesenteric ischemia.
RESULTS: A 62 years old caucasian man was admitted to the emergency room for sudden abdominal pain. He had past history of arterial hypertension and myocardial infarction 16 years before. Embolic occlusion of the superior mesenteric artery was revealed at the computed tomography. Laparotomy with embolectomy and small bowel resection was performed. 2 days after second look laparotomy was realized and small bowel continuity was restored. At the computed tomography there was laso 29 millimeter pediculated mural thrombus of the ascending aorta. 2 weeks later, under hypothermia and circulatory arrest to avoid aortic clamping, ascending aortic replacement was realized. There was no complication.
CONCLUSIONS: Primary aortic mural thrombus can occur in the ascending part of the aorta and be huge. When it is symptomatic, it needs to be treated.

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Hybrid coronary revascularization in multi-vessel coronary disease. See the difference already in early postoperative period

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BACKGROUND: To estimate early outcomes after hybrid coronary revascularization (HCR) in comparison with conventional off-pump coronary artery bypass grafting (OPCAB) in patients with multi-vessel coronary artery disease (CAD).
METHODS: Patients admitted to the Clinic during 2018 for routine surgical coronary revascularization for multi-vessel CAD were analyzed prospectively. 112 selected patients were divided into 2 groups: 1st group - 77 patients underwent OPCAB resulting in 2-3 grafts through a full sternotomy; 2nd group - 35 patients with performed HCR. HCR consisted of 2 stages. Minimally invasive direct coronary artery bypass grafting

(MIDCAB) through an antero-lateral minithoracotomy was performed by a single left internal mammary artery graft to the left anterior descending coronary artery. Later on the 3d day postoperatively PCI stage was performed. Exclusion criteria were redo operation, Myocardial Infarction in acute phase, oncology in active stage.
RESULTS: The age of patients was 18-80 years, 72,5% of men. Two groups had no differences in main parameters including age, sex, LVEF, prevalence of diabetes mellitus, COPD, Myocardial Infarction in anamnesis. They were patients with preserved LVEF, NYHA functional class up to 1. There were no hospital deaths in both groups. In HCR group there was no need in conversion to cardiac-pulmonary bypass because of hemodynamic instability, early postoperative reoperation due to graft failure, no cerebrovascular accident was seen. Only 1 patient (2,8%) after HCR suffered from wound infection. The dose of cardiotonic support in intra and early postoperative period was significantly lower in HCR group in comparison with OPCAB group (P<0,05). Treatment in ICU after operation was significantly longer in OPCAB group (P<0,05) as well as hospital stay length before discharge (P<0,05).
CONCLUSIONS: Hybrid coronary revascularization offers better early postoperative results leading to faster discharge and effective rehabilitation as compared with conventional surgery. There is a need of long-term outcome assessment.

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A novel technique using double layered fibrin sealant and bioglue for type a aortic dissection

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BACKGROUND: The dissected aortic wall is extremely fragile, so that the reinforcement of the stump at the anastomosis is an important procedure affecting the performance of the operation. In this study, we have developed a new stump technique using combination of double layered fibrin sealant and BioGlue.
METHODS: From 2014 to 2018, 48 consecutive patients underwent emergent surgery for acute type A aortic dissection. The mean age was 72.0 ± 11.4 years. Supracoronary graft replacement was performed in all the patients (ascending aorta/hemiarch replacement: 10/48=21%, total arch replacement: 38/48=79%). Firstly, we performed fibrin glue was sprayed onto the collagen layer of the fibrin sealant. Subsequently, the fibrin sealant was put together with the irrigated collagen layer. As a result, the dry fibrinogen/thrombin layers, as an adhesive surface faced outward. This double layered sealant was trimmed to a 10mm-wide strip. These sealants were inserted into the false lumen, and BioGlue was used to fill the gap between the sealants and vascular wall. Next, the stump was gently pressed to fix the aortic intima and adventitia.
RESULTS: In-hospital mortality was 2.0% (N.= 1). After surgery, neurological complications and other permanent organ dysfunction were not recognized in recovery patients. During surgery, dehiscence of vascular tissue due to a suturing needle was not observed. Recurrent dissection and pseudoaneurysm were not observed in postoperative CT.
All operative survivors were followed (100%) and CT follow-up was available in 91.7% for a mean duration of 2.2 years, there was no redissection or pseudoaneurysm.
CONCLUSIONS: Our novel stump techniques using combination of double layered fibrin sealant and BioGlue is safe and effective at repairing the dissected aortic wall in the acute phase. This method is a useful technique that reinforces tissues which is biodegradable in the remote phase, and strengthens the adhesive force by self-repairing tissue repair.

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How to treat atriogenic mitral regurgitation with large bilateral atriums and atrial fibrillation

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BACKGROUND: Atriogenic mitral regurgitation is sometimes treated by posterior mitral leaflet augmentation.Inspite of the anatomy of the mitral valve is normal. So we adopted aggressive bilateral atrial volume reduction and ring annuloplasty.
METHODS: We resected left atrial appendage and left atrial wall by 30mm width, and right atrial appendage and right atrial wall and fossa ovalis was resected. Mitral and tricuspid valve was treated with ring annuloplasty. Then the mitral valve faced to the four pulmonary vein orifices.
RESULTS: Left atrial volume was reduced from 1400ml to 300ml. Right atrial volume was reduced from 760ml to 250ml caluculated by computed tomography. LA diameter was reduced from 72mm to 40mm in the long axis view of the echo cardiogram. And unexpectedly atrial fibrilarion was defibrillated, the rhythm changed to atrial rhythm rate 72. Mitral and tricuspid regurgetation was changed from severe to none. Patient's NYHA changed from 3 to 1.
CONCLUSIONS: Mechanism of mitral regurgitation is posterior leaflet tethering caused by deviation of posterior mitral annulus which is pulled by the large left atrial pressure and deformity. Because the true condition of the atriogenic mitral regurgitation is the left atrial enlargement, mitral regurgitation and atrial fibrillation. The anatomy of the mitral valve is almost normal. So the both atrial volume reduction is more reasonable than the posterior mitral leaflet augumentation.

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Baseline systolic myocardial dysfunction as a predictor of adverse outcomes of percutaneous coronary intervention

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BACKGROUND: To investigate the effect of baseline systolic dysfunction on long-term outcomes of coronary artery disease in patients after elective percutaneous coronary interventions (PCI).
METHODS: An retrospective observational study included 162 patients referred for elective percutaneous coronary intervention (PCI). The first group included 141 patients with left ventricular ejection fraction (LV EF) ≥50% before PCI. The second group included 21 patients with baseline LV EF less than 50%. Outcomes of interventions were assessed 6 years after the index PCI, by analyzing medical records and telephone interviews. The primary endpoint of the study was the frequency of death from cardiovascular causes. The secondary endpoints were total mortality, the incidence of major adverse cardiovascular and cerebral events (MACCE), incidence of nonfatal acute myocardial infarction (AMI).
RESULTS: 6 years after index PCI, death from cardiovascular events was recorded in 10.9% of patients (7% in the first group and 38.9% in the second, P=0.0002). Total mortality was 14.4% (10.9% and 41.2% respectively, P=0.003). MACCE were registered in 39.9% of patients (36.2% and 66.7% respectively, P=0.026). AMI developed in 10.1% of patients (7.3% and 31.3% respectively, P=0.01). It was shown that the baseline decrease in LV EF <50% is associated with an unfavorable course of the disease in the long-term period (6 years) after planned PCI,

and is a predictor of the development of the fatal cardiovascular events (OR = 8.41; 95% CI [2.63– 26.97]; P=0.000), total mortality (OR = 6.19; 95% CI [2.01–19.04]; P=0.000), MACCE (OR = 3.61; 95% CI [1 , 27–10.25], P=0.012); AMI (OR = 5.62; 95% CI [1.44–21.99]; P=0.006).
CONCLUSIONS: Baseline systolic dysfunction is a predictor of general and cardiovascular mortality, as well as major adverse cardiovascular events in the long-term period after elective PCI.

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Factors affecting mortality after proximal aortic repair

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BACKGROUND: Proximal aorta and arcus aorta surgery are complex surgical interventions for cardiac surgery practices. Cerebral protection and peripheral organ perfusion are important factors which determine the prognosis of patients. In this study, we aimed to determine perioperative factors influencing mortality in patients undergoing elective proximal aorta and arcus aorta aneurysm repair.
METHODS: Between 2012 and 2017, 112 consecutive patients were retrospectively analyzed. There were 68 male patients (60.7%), with a mean age of 58.3±14 years. 8 patients had mitral valve replacement and 7 patients had coronary surgery additionally to main surgery. We used aortic arch, axillary and femoral artery cannulation sites. The mean aortic cross-clamp time and total bypass time were 89.2±37.2 and 127.2±48.6 minutes. Univariate and multivariable logistic regression analyses were performed to determine risk factors affecting mortality.
RESULTS: The mean postoperative drainage was 632.1±382.5. Mean intensive care unit stay was 4.7±3.3 and mean in hospital stay was 11.3±5.6. Nine patients (8%) died during hospitalization. In univariate analysis age, sex, body mass index, ejection fraction, hypertension and diabetes mellitus didn't show significant difference (P>0.05). Chronic obstructive pulmonary disease, peripheral arterial disease, postoperative revision, total bypass time, red blood cell transfusion, acute kidney injury and intensive care unit stay showed a statistically significant correlation with mortality (P<0.05). At multivariate analysis, acute kidney injury showed significant difference with mortality.
CONCLUSIONS: Proximal aorta and aortic arch surgery carry acceptable risk for mortality with appropriate surgical technique. Acute kidney injury is the most important factor which affects postoperative mortality of patients.

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Our cardioplegic flow index as a model for intraoperative evaluation of coronary artery bypass grafts

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BACKGROUND: Patent bypass grafts are fundamental to successful coronary artery bypass grafting. Nowadays, Transit-Time Flow Measurement (TTFM) is commonly used to assess intraoperatively the quality of the coronary bypass grafts and it has been strongly recommended by the guidelines on myocardial revascularization. The aim of our study is to validate our cardioplegic flow index as an alternative model for the intraoperative evaluation of the coronary artery by pass grafts.
METHODS: From January 1, 2014 to December 31, 2017, 825 patients underwent isolated coronary artery bypass grafting (CABG). There were 742 arterial and 1485 vein graft.We usually measure the flow and the pressure into the venous graft during cardioplegic infusion and calculate the ratio between flow and pressure. Graft patency was assessed by coronary angiography after the onset of symptoms or instrumental signs of cardiac ischemia.Discrimination of the CFI was determined using the area under the receiver operating characteristic (ROC) curve (AUC) and the best "cut off" by Youden's index.
RESULTS: A total of 1485 vein grafts were enrolled and in each of them we have measured the flow both by TTFM and by CFI. CFI was 0,89 +0,38 (mean +S.D.) Area under the ROC curve of CFI was 0.969 [95% confidence interval (CI): 0,742 – 0,98; p < 0,0001) and the best cut-off was 0,55 (sensitivity: 91,7% and specificity: 100%).The mean follow-up of the patients underwent coronary angiography was 10,38 +5,97 (mean +S.D.) months
CONCLUSIONS: TFM actually remains the most commonly method used to assess the quality of CABGs and predicte their long-term patency. Nevertheless, CFI could be another important tool to check intraoperatively the quality of the anastomoses, overall because it has got a sensitivy and specificity higher than TTFM. The limitation of the method is only that you can't assess the flow of the Internal Mammary Arteries (AMI).

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On-pump beating-heart versus conventional coronary artery bypass surgery in patients with left main disease

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BACKGROUND: On-pump beating-heart technique is successfully used in high-risk patients. However, the use of this technique in stable patients is not well thoroughly evaluated. This single-center randomized study aimed to evaluate the impacts of conventional coronary artery bypass grafting (CABG) and on-pump beating-heart CABG for surgical revascularization on early and mid-term outcomes in stable patients with left main coronary artery disease.
METHODS: We randomly assigned 420 patients with left main coronary artery disease scheduled for elective CABG to either conventional (on-pump CABG with aortic cross-clamping) or on-pump beating-heart procedures. The primary short-term endpoint was a composite of death or complications (reoperation, acute myocardial infarction, cardiac arrest, coma, stroke, or renal failure) before discharge or within 30 days after surgery. The primary long-term endpoint was a composite of death from any cause, a repeat revascularization procedure, or a nonfatal myocardial infarction within 1 year after surgery. Secondary endpoints included the completeness of revascularization, graft patency at 1 year, neuropsychological outcomes, and the use of major resources.
RESULTS: There was no significant difference between on-pump beating-heart and conventional CABG in the rate of the 30-day composite outcome (7.9% and 6.8%, respectively; P=0.17). The rate of the 1-year composite outcome was higher for on-pump beating-heart than for conventional CABG (9.8% versus 7.6%, P=0.03). Follow-up angiograms in 251 patients revealed that the overall rate of graft patency was lower in the on-pump beating-heart group than in the conventional CABG group (83.9% *vs.* 88.3%, P<0.01). There were no significant differences in neuropsychological outcomes or short-term major resources use.
CONCLUSIONS: At 1 year of follow-up, patients in the on-pump beating-heart group had worse composite outcomes and poorer graft patency than did patients in the conventional CABG group.

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Long-term follow-up of the shelhigh superstentless bioprosthesis aortic valve and valved conduit, a monocentric experience

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BACKGROUND: The Shelhigh Superstentless is a stentless aortic valve bioprosthesis and aortic root valved conduit. In 2007, this device was recalled by FDA due to doubt about malfunctionand sterility, and subsequently reintegrated by Biointegral Inc. Few data are available over late durability of this device. We performed a long-term follow-up of Shelhigh devices implanted in our center.
METHODS: Between 2002 and 2007, 44 patients had aortic valve replacement with a Shelhigh device (40 had an aortic valve bioprosthesis and 4 had a valved conduit). We performed a clinical and echocardiographic follow-up (9.2 years ± 4.3; 403.3 patient-years, 100% complete). Standardized definition for valve-related events were adopted.
RESULTS: At discharge, maximum and mean aortic gradients averaged 36.1 ± 11.3 and 21.0 ± 6.8 mmHg, respectively. The 30-days mortality was 2.3%. During the follow-up, 29 patients died (65.9%); 2 deaths were valve-related. Overall survival at 1, 5 and 10 years was 97.7%, 85.8% and 54% respectively. At last echocardiography, average transvalvular gradients remained globally stable in the population (33.6 ± 12 and 20.4 ± 10.5 mmHg). Eight (19%) Structural Valve Deterioration (SVD) events were reported: one as stenosis, 6 as regurgitation and 1 mixed. Two (5%) Non-Structural Valve Dysfunction (NSVD) events occurred (periprosthetic leak). Two (5%) infectious endocarditis events and 2 (5%) valve thromboses were also deplored. Three (7%) patients required reoperation (1 due to endocarditis and 2 due to SVD).
CONCLUSIONS: The immediate hemodynamic performance of the Shelhigh aortic bioprostheses is less optimal than other stentless or some stented bioprostheses. Nonetheless, hemodynamic performance tends to remain stable in the long-term. Patients' survival at follow-up is satisfactory, although continued surveillance is necessary (limited, not-alarming yet observable rate of SVD). BioIntegral® valved tubes can be considered in case of destructive endocarditis or infected root prostheses, due to expected resistance to reinfection.

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Predictors of coronary grafts failure 6 months after surgery

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BACKGROUND: To evaluate 6 months coronary grafts patency and to determine the factors that predict their early occlusion.
METHODS: 238 consecutive patients underwent isolated coronary artery bypass grafting (CABG) between January 2014 and May 2016. The operative mortality was 3.36% (N.= 8/238). Six months after surgery, patients have benefited from a coronary computed tomography angiography (CTA), when stress tests were negative, and from an invasive coronary angiography (ICA), in the opposite case. Any graft showing Fitzgibbon type B or O lesions on angiography was considered to be a failing graft. Baseline characteristics and operative parameters were collected for each patient.
RESULTS: 145 patients have benefited from a coronary angiography (134 CTA and 11 ICA). 145 left internal thoracic arteries (LITA), 89 right internal thoracic arteries (RITA) and 89 saphenous vein grafts (SVG) were analyzed. 96.3% of LITA anastomosed to the left anterior descending (LAD) artery were patent. In the right and circumflex coronary territories, the patency of the RITA was significantly higher than that of the SVG: 83.9% and 66.3%, respectively, P=0.01. Univariate analysis showed that SVG occlusion was related to female gender (P=0.03), cardiopulmonary bypass time ≥110min (P=0.014) and homologous blood transfusions (P=0.037). No predictive factor of occlusion of LITA or RITA has been identified.
CONCLUSIONS: In the 6th postoperative month, LIMA has an excellent patency, while one third of SVG are already occluded. RIMA should be favored over than SVG, in the revascularization of the circumflex and right coronary territories. Total arterial revascularization should be encouraged in female gender and homologous blood transfusions should be avoided when SVG was used.
KEYWORDS: Computed tomography angiography, coronary artery bypass.

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New operative strategy for acute type A aortic dissection: consideration for predictors of mortality

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BACKGROUND: In the management of acute type A aortic dissection (ATAAD) patients, survival is strongly dependent on a sufficient operative strategy and emergency surgery has become the gold standard, but the major influencing factors on mortality still remain uncertain.
METHODS: Between January 2009 and December 2018, 216 consecutive patients with ATAAD were treated surgically in our institution. To investigate the influence of perioperative variables on in-hospital mortality, various parameters deemed relevant were assessed. The mean age of patients was 66 years (29 to 91), and 50.9% were male. All patients were diagnosed on CT scan. Replacement of the ascending aorta or the hemiarch was performed in 70.8%, replacement of the aortic arch with the supra-aortic vessels reconstruction in 19.4%, aortic root replacement in 7.9% and TEVAR in 1.9%. An elephant trunk was used in 18 patients, for nine of whom frozen elephant trunk (FET) was adopted.
RESULTS: Overall in-hospital mortality was 14.8% (32/216). 11 cases died from AMI, 6 from stroke, 4 from hypoxic-ischemic encephalopathy (HIE), 3 from low cardiac output syndrome, 2 from myonephropathic metabolism syndrome or fatal arrhythmia, etc. Major morbidity included cardiac tamponade 24.1%, stroke 20.4%, peripheral ischemia 11.6%, AMI 11.1%, CPR 8.3%, HIE 3.2%, mediastinitis 1.9% and paraplegia 1.4%. When AMI occurred associated with ATAAD, it had high operative mortality 45.8%. It had 100% (8/8) mortality in case of cardiogenic shock due to a left main coronary artery culprit lesion. Aortic arch replacement with FET had mortality 11.1% and seemed to promote aortic remodeling.
CONCLUSIONS: Emergency surgery for ATAAD with cardiogenic shock complicating AMI has extremely high risk. It may lead to better results for some cases to perform ATAAD surgery after recovery from cardiogenic shock by means of PCI. Our experience indicates that FET represents a feasible and efficient option for ATAAD surgery.

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Mitral valve endocarditis: epidemiology and principles of surgical management

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BACKGROUND: Mitral valve endocarditis is a challenging illness. Its optimal treatment is debated. This study aims to determine the risk factors, etiology, pathology and outline principles for optimal management of mitral endocarditis.
METHODS: Retrospective data analysis of all patients operated for active mitral valve endocarditis between 2013 to 2016. Patient's demographics, pathology, aetiology, type of surgery performed, risk factors and outcome for mitral valve endocarditis were determined. Parameters were compared with patients who had non-endocarditis mitral valve surgery during the study period. Statistical analysis using chi-square and student's *t*-test were performed and a P value less than 0.05 is significant.
RESULTS: 452 mitral valve surgery were performed during the study period, 54 patients with active endocarditis constitute the study group (N.=54). 57% were male. Mainly younger patient age 59(48-68) years compared to non-endocarditis group median 70(61-77),P=0.00001. The Euroscore was higher in the study group 4.69(2.71-7.94):8.80(6.01-13.8), P=0.0001, there was higher rate of ICU readmission OR=2.44(0.85-6.94), High rate of preoperative dialysis OR=5.79(1.26-26.6), The Median CRP at time of surgery was 62(19-112), Median serum Albumin at time of surgery24 (20-28) g/dL, there was significant decrease in LVDD postoperatively(5.22 *vs.* 4.78) cm, P=0.0037. Bacteriology was streptococcus 53.7%, Staphylococcus 20.3%, negative culture 16.6%, enterococcus 5.5%, fungal 1.8%, mycobacterium chimaera 1.8%. Pathology of valve associated with endocarditis includes myxomatous mitral 33%, prosthetic valve 5.5%, and bicuspid aortic valve 11%.The associated remote foci for infection included,septic joint 9%, dental 7%, bowel instrumentation 7%, urinary tract 3.7%.mortality was 1% and 57.4% had mitral vave repair
CONCLUSIONS: Mitral valve endocarditis is a catabolic state with high risks for morbidity. predisposing factors include myxomatous valve,prosthetic valve and bicuspid valve. its common in younger and male patients. few remote infection foci can found. Valve repair is optimal care but replacement is acceptable. A multidisciplinary team approach is the recommended standard of care.

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Splenectomy after LVAD Implantation

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BACKGROUND: The paper presents collaboration of an abdominal surgeon and heart team in deciding upon surgical management of a 28-year-old male patient who has undergone emergency abdominal operation for spleen rupture after LVAD implantation.
CASE REPORT: Disscusion focuses on the significance of prompt diagnostics, abdominal organ exposure along the placed left ventricular assist device driveline, identification of vascular structures in conditions of continuous blood flow, clinical challenges of hemodynamic and anticoagulant treatment, and reconstruction of the surgical wound in the drive-line projection.

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A rare cause of acute coronary syndrome: carbonmonoxide poisoning

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BACKGROUND: Carbon monoxide (CO) intoxication is one of the most common cause of toxicological events. Firewood, coal, manufactured gas, gas heaters are common sources of CO and it can easily accumulate in environment and results accidental death especially during winter season. Clinical manifestation usually involves central nervous and cardiovascular systems, because brain and heart are most sensitive organs to low oxygen level. Tissue hypoxia and increased platelet aggregation have an important role in myocardial infarction pathogenesis during carbon monoxide intoxication. Though myocardial infarction is rarely reported after CO intoxication, no distinct ratio is given.
METHODS: In this study, we present a 69-year-old man who had coronary artery bypass surgery and acute anterior myocardial infarction after exposure to CO.
RESULTS: A 69-year-old male patient presented to the emergency department with carbon monoxide poisoning and angina. Persistent st elevation and increase of cardiac enzyme were detected and coronary angiography was performed due to acute coronary syndrome. Coronary bypass surgery was decided as a result of angiography. The patient was evaluated for comorbid factors. Bilateral obstructive ureteral calculi was detected and percutaneous nephrostomy was performed upon elevation of creatinine value. After completion of preoperative preparations , coronary artery bypass surgery was performed successfully . The patient stayed in the intensive care unit for 3 days and was then taken to the ward. After receiving the nephrology and urology view, the patient was discharged from the hospital on the 7th postoperative day.
CONCLUSIONS: CO intoxication may be associated with acute coronary syndromes including thrombus formation in coronary arteries. Therefore a baseline ECG and serial cardiac enzyme evaluation should be performed in patients admitted for CO poisoning. Patients with persistent ST elevation, previous history of coronary artery disease or high risk factors may benefit from coronary angiography and surgical revascularization.

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A rare congenital cause of aortic valve dysfunction: quadricuspid aortic valve

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BACKGROUND:Quadricuspid aortic valve is a rare congenital cardiac anomaly causing aortic regurgitation usually in the fifth to sixth decade of life. The diagnosis was mostly during postmortem or intraoperative, also now with the advent of better imaging techniques such as transthoracic echocardiography, transesophageal echocardiography and cardiac magnetic resonance imaging, more cases are being diagnosed in asymptomatic patients.

METHODS: In this report, we present a patient with mild aortic regurgitation resulting from quadricuspid aortic valve replaced with a mechanic aortic valve and also was performed coronary artery bypass surgery.
RESULTS: A 66 year-old female presented to the emergency room with unstable angina. Coronary angiography was performed by cardiologist immediately and coronary artery disease was detected. Preoperative echocardiography showed mild and middle aortic stenosis. There were no echocardiographic findings that there were four leaflets in the aortic valve.The patient were performed coronary artery bypass surgery and the aortic valve was evaluated as a quadricuspid aortic valve. Therefore aortic valve replacement with mechanical aortic valve was performed simultaneously. After successful operation, the patient was admitted to intensive care unit and discharged on the 7th postoperative day.
CONCLUSIONS: As a result quadricuspid aortic valve is a rare condition and presents itself with aortic valve insufficiency or stenosis in the adulthood. Preoperative transthoracic echocardiography is helpful in the diagnosis. Furthermore, advanced investigation is needed for accompanying anomalies and confirm diagnosis. Surgical treatment either reconstruction or replacement is similar to tricuspid aortic valve disease.

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Congenital supravalvular aortic stenosis: surgical outcomes

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BACKGROUND: supravalvular aortic stenosis (SAS) is known to involve the whole aortic root. In order to preserve long-term aortic valve function and allowance for growth were proposed single-patch or symmetric reconstruction with two- or three-patch technique . This is unproven. We compared patients who have undergone either single-or inverted bifurcated patch plasty technique.
METHODS: Seventeen patients (7 male, 10 female, mean age of 8,25 years, range 1-19) who underwent surgery for SAS were included in this retrospective analysis. Ten patients had features of Williams syndrome. Two patients had other concomitant procedures. A single patch was inserted into the longitudinal incision, which passed across the stenosis into the non-coronary sinus in 10. A Doty technique was used in 7 patients. Changes in aortic root following repair were documented using echocardiography, aortography.
RESULTS: No operative deaths occured. The mean preoperative gradient decreased from 82.6 ±17 mmHg (range 50 – 145 mmHg), to 14.6±7 mmHg (range 8-30 mmHg) early postoperatively. There was no significant difference in the incidence of postoperative aortic regurgitation or gradient across the repair between two techniques according to the echocardiograms and catetherization findings.
CONCLUSIONS: According to our study, we cannot demonstrate any benefit in reconstructing the whole aortic root for SAS. Good surgical outcome of congenital SVAS can be achieved with the appropriate method of treatment in patients with both: single- and multiple-sinus reconstruction. The choice of material for the patch does not affect the long-term results of surgical treatment.

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Phenotypic and genotypic approach of a large family with early onset tricuspid aortic valve sclerosis-stenosis

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BACKGROUND: Aortic valve sclerosis-stenosis (AVS) is regarded a consequence of cardiovascular risk and genetic factors. Severe AVS is a significant cause of morbidity and mortality in approximately 5% of individuals over 65 years of age. We aimed to study genetic and non-genetic determinants of AVS in a large family with little cardiovascular risk factors.
CASE REPORT: We identified a large family of AVS. We proposed a comprehensive screening to all relatives with clinical, biological and echocardiography assessment. Aortic valve (AV) calcium score was evaluated by CT scan.Genetic approach consisted of a combination of IBD (Identity By Descendance) and whole genome sequencing to identify rare causal variants.
To date 38 members (53.1±15.8 years, 19 males) have been screened, 15 are affected (62.4.6±12.7 years) and 23 non-affected (47.1.3±15.0, P<0.01). Echocardiographic examination revealed a unique inheritable phenotype of sclerosis or calcified progressive stenosis with a fusiform aorta. All AV were tricuspid, with a sclerosis in 13 (36.8%) or stenosis in 2 (5.3%). Initial aorta was larger in (34.2±4.4 *vs.* 27.1±4.6 mm, P=0.02) and AV calcium score greater (102.8±56.7 *vs.* 0 AU, P=0.02) in affected members. A ratio of sinotubular junction diameter/initial ascending aorta diameter was calculated on echocardiography and was lower in affected members (0.88±0.08 *vs.* 0.94±0.05, P<0.02) which confirmed significantly this unique phenotype with a fusiform aorta. High rate genotyping of 20 individuals (12 affected and 8 non-affected) allowed us to identify a common IBD region for all affected members on chromosome 5. Whole genome analysis was carried out in 4 cousins or nephew allowing the identification of 18 rare functional variants shared by at least 3 out of 4 sequenced individuals.
While specific gene remains to be identified, IBD found a chromosome 5 region associated with AVS in this large family.

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Early and late results of coronary revascularization in patients with chronic kidney disease

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BACKGROUND: Chronic kidney disease (CKD) is a strong predictor of mortality after percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). This study compares outcomes in patients with CKD undergoing PCI and CABG.
METHODS: We retrospectively reviewed 411 consecutive patients with CKD (glomerular filtration rate <60 ml/min) who underwent either CABG or PCI for multivessel CAD at our institute from Jan, 2010 to December, 2016.
RESULTS: Our patients were divided into 2 groups. Group (A) included 265 patients who underwent PCI, and 146 had CABG as group (B). Females were 65 (24.5%) in group A, and were 43 (29.5%) in group B (P=0.23). Age was 63.71±11.04 in group A and 62.29±9.67 in group B (P=0.35). Patients on hemodialysis in group A were 51 (19.2%) and 80 (54.8%) in group B (P<.0001). Ejection fraction was 36.04±11.14 in group A and 32.14±14.21 in group B (P=.09). Diabetics was 201 (75.8%) in group A and 107 (73.3%) in group B (P<.19). History of cerebrovascular accident was 20.6% in group A compared to 12.2 % in group B (P<.02). Post intervention results regarding needing for permanent hemodialysis; was 11 patients in group A (4.2%) and 16 patients (10.9%) in group B (P<.01). In hospital mortality was 5 patients (1.9%) in group A and 4 patients (2.7%) in group B (P=.43). Late mortality was 25 patients (9.4%) in group A and 6 patients (4.1%) group B (P<.05). Repeat revascularization was 37 patients (14%) in group A and 9 patients (6.2%) in group B (P<.001).

CONCLUSIONS: Coronary artery bypass grafting is associated with higher incidence of need for permanent hemodialysis compared to percutaneous intervention in patients with chronic renal dysfunction. Late mortality and need for repeat revascularisation is significantly higher with percutaneous intervention.

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Cavopulmonary anastomosis in patients less than 3 months old

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BACKGROUND: The bidirectional cavopulmonary shunt (BCPS) has become a well-established procedure for the palliation of functionally univentricular hearts. There was a combination of factors not to do BCPS in young infants including, unfavorable results after classic Glenn shunt in babies and uncertainty regarding the reactivity of the pulmonary vasculature in this group of patients.
METHODS: This retrospective study includes all consecutive newborns who underwent Glenn procedure between 2003 and 2015. We will divide them into 2 groups, group A (N.=26) who underwent Glenn under 90 days of age, and group B (N.=307) more than 90 days.
RESULTS: Age was 57.8±23.3 days in group A and 544.2±128.21 days in group B (P<0.001). Group A had male 22(84.6%) while group B had 178 (58%) (P=0.005). Body weight was also found to be significant 4.67±1.67 kg in group A and 10.26±8.5 kg in group B (P=0.004). Discharge oxygen saturation, time to Fontan, ICU stay and length of stay were not significantly different. Take down Glenn and established BT shunt was detected in one patient (7.69%) of group A, while only one case of group B (0.33%) was taken down (P<0.001). Ten cases of group A had extracardiac Fontan (38.46%), and 61 (19.86%) of group B had their Fontan. Early mortality was reported in one patient of group A (3.85%). In group B early mortality occurred in 6 patients (1.96%) with no significance. Late mortality was recorded in 1 patient of group A (3.85%) while 7 patients (2.24%) died during follow up of group B before the age of Fontan.
CONCLUSIONS: Early Glenn shunt can be done safely in patients less than 3 months of age, with early and late mortality similar to older Glenn patients.

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Survival after leaflet escape in contemporary On-X heart valve

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BACKGROUND: Leaflet escape in contemporary mechanical valves is extremely rare. Some older models are well-known for having a higher risk of presenting this complication. The most documented cases are those of the Björk "Shiley valve, the Edwards" Duromedics bileaflet prosthesis, and the TRI Technologies valve. To the best of our knowledge, only a previous case of leaflet escape with the contemporary On-X mechanical valve has been reported. We report the second known case and the first one to recover from surgery.
CASE REPORT: A 71-year-old male presents with sudden resting dyspnoea and palpitations that started shortly after a 100-kilometre bicycle ride. He had undergone emergency mitral valve replacement with an On-X Conform valve 7 years PRIOR. X-ray showed signs of acute pulmonary oedema. Transesophageal echocardiography (TEE) showed massive mitral regurgitation. In addition, one of the leaflets could not be visualized. Emergent surgery was indicated. Patient condition worsened after anaesthetic induction. Peripheral extracorporeal circulation had to be stablished prior to re-sternotomy. Upon inspection of the prosthesis we observed that the entire medial disc was missing and had migrated outside the left cardiac chambers. We proceeded to implant a biological prosthesis and a tricuspid ring. The patient could be weaned from bypass successfully. He developed inflammatory response syndrome, acute renal failure and pneumonia. He could be extubated after 35 hours. In a postoperative full-body CT-Scan the hemidisc was located at the aortoiliac bifurcation. The patient was discharged on postoperative day 26. Disk recovery was planned for several weeks later, once the patient was fully recovered.
CONCLUSIONS: This is the first case of leaflet scape we have observed after implanting 1369 On-X prostheses. This complication should be suspected when one of the discs can't be visualize properly by TEE. A good evolution after surgery is achievable if surgery is performed before important organ damage occurs.

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The rupture of atrioventricular groove after redo-mitral valve replacement

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BACKGROUND: One of the most alarming complications of heart surgery is posterior ventricular rupture (PVR). PVR should be diagnosed immediately and repaired without any hesitation.
METHODS: Here, we present a successful repair of PVR after Redo-MVR.
RESULTS: A 58-year-old female patient who underwent MVR operation in 2014 was admitted to our clinic with dyspnea. In transthoracic echocardiography examination; peak gradient (PGR): 31 mmHg, mean gradient (MGR): 16 mmHg, mitral valve area 1.9 cm2, moderate Mitral Regurgitation, and moderate Tricuspid Regurgitation was observed. A 2x4 mm diameter thrombus was seen on the mitral valve. In Transesophageal Echocardiography examination; A hypoechoic mass, which appeared similar with a thrombus measuring 22 x 6.4 mm, was thought to be connected to the antero-lateral and postero-lateral surface of the annulus was reported. The movement of one of the prosthetic valve occluders was found to be severely restricted due to thrombus. There was no paravalvular mitral regurgitation. Moderate valvular mitral regurgitation and mild tricuspid valve regurgitation was reported. Redo MVR procedure was planned. The previous mechanical valve was excised. 27 mm mechanical prosthetic valve were placed. CPB was terminated. During the bleeding control, it was seen that there was arterial bleeding from the posterior side of the heart. CPB was started immediately. Atrioventricular groove rüpture (type 1 PVR) was detected. Then, mechanical prosthetic valve was removed. Ruptured area was repaired with 3x6 cm pericardial patch and a 27mm mechanical prosthetic valve was placed again. CPB was terminated. The patient was followed-up in the intensive care unit for 4 days and was discharged on the 11th postoperative day.
CONCLUSIONS: The main point in PVR is to recognize the possible risk factors in order to prevent this complication, to adopt preventive surgical approaches and to immediately repair with appropriate approach when it occurs.

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Successful surgical correction of undetected tetralogy of fallot in a 60 year-old patient

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BACKGROUND: Tetralogy of Fallot is the most common cyanotic cardiac lesion with an incidence of approximately three to five per 10,000 live births. Commonly, its symptomatic presentation requires early intervention in the first year of life. Herein, we present a successful one-stage primary surgical correction of a rare case of late diagnosed Tetralogy of Fallot in a 60-year-old patient.
METHODS: A 60-year-old patient was referred to our clinic with progressive weakness and 10 kg weight loss within one year. During the screening, a computer tomography revealed a pericardial effusion of 3.9 cm. Echocardiography demonstrated a membranous Ventricular septal defect, right ventricular hypertrophy of 17 mm with right ventricular outflow tract obstruction, severe pulmonary valve stenosis (mean gradient of 90 mmHg) combined with mild regurgitation as well as a post-stenotic dilatation of the pulmonary artery. Through median sternotomy with double venous cannulation, moderate hypothermia was achieved. The VSD had a diameter of 1.3 cm and was closed through the aortic valve using a Dacron® patch with interrupted sutures. The heavily calcified pulmonary cusps were excised. Subsequently, the severely obstructed right ventricular outflow was enlarged using a 21 mm freestyle aortic root prosthesis (Medtronic®).
RESULTS: Ischemia time was 81 minutes and overall perfusion time was 241 minutes. At the end of the procedure, transoesophageal echocardiography did not reveal any patch or valvular insufficiency.
The patient was extubated within 12 hours after surgery. Apart from a complete atrioventricular block and, accordingly, a dual chamber permanent pacemaker implantation on the 6th postoperative day, there were no any other complications or events. The patient was discharged from the ICU to the normal ward on the 7th day and from the hospital on the 14 th day, postoperatively.
CONCLUSIONS: Successful complete surgical correction of undetected Tetralogy of Fallot is still possible in elderly patients.

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Percutaneous Axial assist device as an effective left ventricular decompression under extracorporeal life support system

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BACKGROUND: Extracorporeal life-support (ECLS) is an established treatment as bridge-to-recovery, during which left ventricular ballooning is hazardous and consequently interferes with the targeted recovery. In order to avoid this, venting of the dilated left ventricle is necessary.
Herein, we present our experience with decompressing the left ventricle during ECLS by introducing a percutaneous transvascular microaxial pump (Impella 2.5®).
METHODS: A 43-year-old male patient had suffered from an increasing shortness of breath for one week. Beside a flu-like infection, he had no relevant medical history. Chest X-ray showed a dilated heart. Echocardiography revealed a severely decreased left ventricelular ejection fraction (LVEF). Immediately after arrival, his condition deteriorated further within few hours and he was resuscitated for 66 min. An ECLS was implanted percutaneously under resuscitation. Despite an ECLS-flow of 5 L/min, the left ventricle was severely dilated and showed no response to high-dose epinephrine stimulation. The mitral valve was severely insufficient. To break this vicious circle, we implanted a transvascular Impella-Pump 2.5®.
RESULTS: Immediately after the implantation of the Impella 2.5®, the ventricle size decreased. Both support devices could be weaned and were explanted after eight days. Cardiac function has improved gradually (LVEF: 40%) and the mitral valve showed no more insufficiency. In the following days, the patient suffered from pneumonia, acute kidney failure, and colon ischemia. A consecutive hemicolectomy had to be carried out. He recovered well from all these complications and could be discharged from the intensive care unit after three weeks.
CONCLUSIONS: Left ventricular dilatation under ECLS is a severe complication which requires immediate treatment. Percutaneous transvascular micro-axial pump (Impella 2.5®) implantation is a minimally-invasive and effective method to deload the left ventricle and support the ECLS as a bridge-to-recovery treatment.

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Pre-rehabilitation: a safe strategy to prevent postoperative complications after cardiac surgery?

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BACKGROUND: The rising prevalence of modifiable risk factors (e.g. obesity, hypertension and physical inactivity) increases the need for effective and safe preoperative interventions to enhance preoperative status and treatment outcome, while preventing avoidable complications in patients awaiting cardiac surgery. Therefore, the potential short-term postoperative benefits and unintended consequences of a multidisciplinary preoperative cardiac rehabilitation (the Heart-ROCQ program) regarding in-hospital acquired complications (*i.e.* atrial fibrillation [AF], delirium, lung infection, prolonged mechanical ventilation [>24hr], re-admissions to the intensive care unit, surgical re-exploration, deep sternum wound infection and 30-day mortality) were explored.
METHODS: Data of patients (≥18 years) who underwent elective cardiac surgery between January 2014 and April 2017 were retrospectively analyzed. Using Pearson's chi-squared tests, patients who followed the Heart-ROCQ program during the waiting period were compared with patients who received no pre-rehabilitation. Sensitivity analyses were performed using logistic regression models to account for gender, age and baseline differences.
RESULTS: 881 patients met the inclusion criteria. 91 patients followed the Heart-ROCQ program, while 790 patients received no intervention during the waiting period. In the primary analyses the incidence of AF was significantly lower in the Heart-ROCQ group (14.3% *vs.* 23.8%, P=0.041). For the other complications no between-group differences were found. In the sensitive analyses, intervention group was no significant predictor (ExpB 0.58, P=0.081) of AF.
CONCLUSIONS: Preoperative cardiac rehabilitation might be beneficial to prevent postoperative AF. Furthermore, patients who followed preoperative cardiac rehabilitation, including aerobic exercise, were not at higher risk for postoperative complications. However, well powered randomized controlled trials, such as the Heart-ROCQ trial (ClinicalTrials.gov: No. NCT02984449), are needed to confirm these results.

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Successful management of combined intoxication in a child using an extracorporeal life support system

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BACKGROUND: Intoxication with tricyclic antidepressant can cause lethal cardiac dysrhythmias and arrest. In combination with high doses of ß-blockers, the synergistic effect exacerbates the cardiac manifestation and is highly lethal. Treatment of such intoxications is merely symptomatic due to the absence of specific antidote. However, the time needed to reach recovery might not be available due to the severe cardiac decompensation. Herein, we present a successful management of this combined intoxication, using an extracorporeal life support system (ECLS).
METHODS: In an attempt of suicide, an 11-year-old girl ingested 500 mg bisoprolol and nearly 4 g of amitryptiline. The child was found unconscious with seizure attacks. On emergency basis, benzodiazepines were administered and the patient was transferred to our hospital. Serum levels of amitryptiline, nortryptiline and bisoprolol were 2198 µg/l, 698 µg/l and 500 µg/l, respectively. Glasgow coma scale was six. Fourteen hours later, she developed ventricular tachycardia with right-bundle-branch-block and impaired cardiac function. Sequentially, the condition was deteriorated into ventricular fibrillation and acute pulmonary oedema. Arterio-venous ELS was installed, under cardiopulmonary resuscitation, percutaneously over the femoral vessels with a maximal flow of 2.2 l/min.
RESULTS: Over four days of ECLS, catecholamines doses could be reduced and cardiac function recovered completely. On the fifth day, the ECLS was weaned and explanted uneventfully. The patient was extubated and showed no signs of neurological dysfunction or sequelae. Two weeks after admission, the patient was discharged from the ICU.
CONCLUSIONS: ECLSs can be implemented successfully as an acute life-saving option in intoxication cases, especially in absence of effective antidotes.

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A case of Alkaptonuria with a rare combined aortic and mitral valve Ochronosis

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BACKGROUND: Alkaptonuria is a rare autosomal recessive disease with an incidence of less than one in 250.000 to 1.000.000. As a disorder of tyrosine metabolism, it is characterized by accumulation of homogentisic acid in extracellular tissues. Commonly, it is manifested by pigmentation of skin, sclera and ear cartilage. Less commonly, a picture of arthropathy or renal calculi has been reported. However, the affection of the cardiovascular system, especially of the heart valves, is rare. Herein, we present a very rare case of combined aortic and mitral valve ochronosis in a patient suffering from alkaptonuria.
METHODS: A 62-year-old female patient with severe aortic valve and moderate mitral valve stenoses required a double valve replacement procedure. Apart from a tiny 3 mm dark pigment spot in the right sclera, there was no any other classical signs or related manifestations of alkaptonuria. A combined aortic and mitral valve replacement with biological protheses was performed.
RESULTS: Operative findings demonstrated a tricuspid and severely calcified aortic valve, extended calcifications to the aorto-mitral continuity and calcified mitral leaflets. Tissues of both valves together with the intima of the aortic wall were extremely dark pigmented. A histological investigation confirmed the presence of extracellular deposits of ochronotic pigment and a chronic inflammatory infiltration. There were no any complications or events during the postoperative course.
CONCLUSIONS: The ochronotic involvement of cardiac valves, especially of the mitral valve, is a very rare manifestation with very limited data in the literature. Our case is an atypical presentation of alkaponuria, which involves only the cardiac valves without obvious presence of any other known clinical signs of this disease. Herein, we present a helpful photographic documentation of this extremely rare condition.

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The arteriovenous hemangioma of the right ventricle: case report and literature review

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BACKGROUND: Cardiac hemangiomas of the right ventricle are very rare and mostly asymptomatic benign tumors. The surgical excision is the first line treatment. We report a case of 69-year old woman with an asymptomatic arteriovenous hemangioma of the right ventricle.
CASE REPORT: Compete surgical excision was performed with the use of cardiopulmonary bypass and the patient was discharged on postoperative day 6 with no relapse at the six months follow-up. The review of the literature showed that this procedure can be performed safely with excellent long term results. 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 lassified 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.
KEYWORDS: cardiac hemangioma, right ventricle, surgery.

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Infective endocarditis associated with spondylodiscitis- 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.
CASE REPORT: 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 ob-

tained grew out Staphylococcus Aureus. Antimicrobial therapy was initiated according the results of blood culture, 4 weeks. Case 2- A78-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 A54-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.
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.
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.

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Assessment of results of aortic root enlargement in patients with narrow fibrous ring

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BACKGROUND: Assessment and comparison of the results of aortic valve replacement in patients with a narrow fibrous ring, who reconstructed the aortic root.
METHODS: 56 patients (mean age 60,77 ± 13,18 years) were included in thestudy. In 98.2% of the aortic root enlargement was performed according to the Manouguian method using mechanical and biological aortic prosthesis, size 19-25. The following prostheses were used for aortic valve replacement: Carpentier-Edwards (C-E) PERIMOUNT Magna Medtronic ATS, Hanncock Medtronic, Sorin Carbomedics, St.Jude Medical Epic, MedEnz, Planics-E. Aortic root enlargement allowed implanting prosthesis larger than the original diameter of the fibrous ring.
RESULTS: Hospital mortality was 16.1%. 3-and 5-year survival rate was 79 ± 0.6 % and higher in patients with mechanical prosthesis (P=0,047, $\chi 2$=3,94). Correction of mitral valve disease and CABG did not significantly affect mortality ($\chi 2$=0,49; 0,22). Significant decrease in LVMM (P<0.001) was observed. There were no significant differences in hemodynamic parameters between the investigated prostheses in postoperative period (P>0.05). The phenomenon "prosthesis-patient mismatch" (PPM) of moderate degree in the long-term period was observed in 31.3% of patients, severe degree - 4.2%. However, hemodynamic parameters on prostheses in these patients corresponded to moderate aortic valve stenosis.
CONCLUSIONS: The development of the PPM phenomenon of moderate degree in postoperative patients did not affect the long-term mortality (P=0.364, x2 = 0.825). Implantation of prostheses of adequate diameter leads to a decrease in pressure gradient at the level of the aortic ring and to an increase in EOA, and also positively effects the patients' functional status. For determination of the further clinical significance of development of the moderate and severe PPN phenomenon, it is necessary to compare this group of patients with patients who under a similar pathology underwent aortic valve replacement without reconstructive aortic root surgery.

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Comparison of the technical characteristics of aortic mechanical bileaflet prostheses valves with 'Planics-E'

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BACKGROUND: This article compares the true dimensions of aortic valve Planics-E with foreign analogues.
METHODS: The study included aortic valves: Carbomedics Standard, Medtronic Open Pivot, St. Jude Medical Regent, MedInzh-2 and Planics-E.
RESULTS: The difference between the true and nominal dimensions of the mechanical valves. Sizers offered by manufacturers are at least 20% smaller than the external sewing ring diameter of the prostheses. In this case, some discrepancy was determined directly and the sizers themselves. Indicators of tissue annulus diameter were close to the data by which it was possible to judge the marking of the prosthesis. On prosthetic St. Jude Medical Regent and Planics-E, tissue annulus diameter fully corresponded to the number of the prosthesis. The external sewing ring diameter of the Planics-E artificial heart valve was smaller in comparison with all sizes of prostheses under investigation, except for Medtronic Open Pivot 23 and 25 sizes. In Planics-E prostheses, the discrepancy between the internal orifice diameter and nominal size was less in relation to all the tested prostheses, with the exception of St. Jude Medical Regent. The geometric orifice area (GOA) was the largest on the prosthetic St. Jude Medical Regent (P<0.005). GOA of prostheses Planics-E was less only in relation to St. Jude Medical Regent, and prostheses of 19 and 21 sizes are 17.19 ± 4.71 % and 20.09 ± 4.05 % larger than other prostheses, respectively.
CONCLUSIONS: Planics-E are not inferior to most modern mechanical prostheses, and surpass them in some indicators. Planics-E prostheses of 19 and 21 sizes are are hemodynamically more favourable for implantation in patients with a narrow fibrous ring.

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Impact of STEMI *vs.* NSTEMI on outcomes of non-emergent CABG after acute myocardial infarction

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BACKGROUND: Despite patients with ST-elevation myocardial infarctions (STEMI) are reported with worse results in comparison with non-ST elevation myocardial infarctions (NSTEMI), those differences are not well-defined fort he relevant patients undergoing coronary artery bypass grafting (CABG). The aim of this study is to compare postoperative outcomes of patients undergoing non-emergent CABG within 1 week after STEMI versus NSTEMI.
METHODS: Patients undergoing non-emergent isolated CABG within 1 week from an MI from 2014 to 2017 retrospectively analyzed. Postoperative outcomes for patients with STEMI *vs.* NSTEMI were compared within each group. Chi-square test was used to compare categorical parameters. Mann-Whitney test was used to compare continuous parameters.
RESULTS: Of the 2230 patients undergoing non-emergent isolated CABG between 1 and 7 days after an MI, 725 patients (32.5%) had a STEMI. Patients undergoing CABG between 1 and 7 days after a STEMI

had more left main disease (24.7% *vs.* 3.1%, p < 0.01), lower ejection fractions (median: 35% *vs.* 40%, P=0.02), and more preoperative intra-aortic balloon pump (59.3% *vs.* 26.7%, P<0.01) as compared to NSTEMI patients. There were no differences in rates of major complication (27.3% *vs.* 19.1%, P=0.19) and mortality (3.14% *vs.* 3.01%, P=0.91) between STEMI and NSTEMI patients. There were also no differences in the length of intensive care unit stay and hospital stay between the two groups.
CONCLUSIONS: Although increased preoperative risk factors in patients with STEMI, there are no differences in major results between STEMI and NSTEMI patients underwent CABG between 1 and 7 days after MI.

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Our experience in 'physiologic' repair of congenitally corrected transposition of grate arteries (CCTGA)

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BACKGROUND: to analyze our experience in the treatment of patients with CCTGA.
METHODS: In our department, from 1995 to 2018, under supervision were 40 patients with CCTGA (0.7 %) from 4months to 49 years of age. In this group of patients was found: insufficiency of the tricuspid valve in 7 patients, VSD in 12, III-rd. degree A-V block in 6 patients (in 5cases being primary A-V block, and in 1 case - after VSD repair), insufficiency of mitral valve – in 3 cases (in one of them as a result of bacterial endocarditis after implantation of endocardial electrode), pulmonary stenosis – 4.
RESULTS: Totally 27 surgeries were performed: correction of systemic valve insufficiency – in 6 patients (plasty – in 4 of them and prosthesis in 2 patients), VSD plasty – 9, pacemaker implantation – 4, mitral valve plasty – 2, pulmonary artery banding – 2, bidirectional Glenn – 1. Surgeries were performed without lethal outcomes. Patients were observed from Patients were observed from 8 months till 14 years. It was done adequate correction of all associated pathology in all patients.
Concerning the progressing of tricuspid valve insufficiency, replacement of it was done in 3 cases.
CONCLUSIONS: the submitted material confirms the given literatures on high risk of development of 1. A-V bloc, 2. Insufficiency of the tricuspid valve, 3.Probability of development of right ventricle failure in the 4-th decade of a life.
Early revealing and adequate correction of accompanying defects and also of a developing complications allow to safe patient life and to achieve satisfactory immediate and long-term results.
Tratamentul chirurgical al patologiilorcardiaceasociateîn Transpoziția corijată de vase magistrale.(TVMC)

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Physical activity in cardiac surgery patients: comparison between squash questionnaire and physical activity monitor 'sensewear'

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BACKGROUND: Little is known about physical activity levels measured with portable monitors in patients requiring coronary artery bypass grafting (CABG). The aim of the current study was to compare self-reported physical activity levels with activity levels measured with the portable activity monitor Sensewear.
METHODS: 32 patients scheduled for an elective CABG surgery in the University Medical Centre Groningen, the Netherlands completed the SQUASH questionnaire and wore the Sensewear for up to 3 days. Outcome measures were the number of patients meeting the Dutch national recommendations for physical activity (NNGB), the durations (min/day) of the physical activity levels (sedentary, moderate, vigorous to very vigorous) and total energy expenditure (TEE).
RESULTS: The percentage of patients meeting the criteria of the NNGB was 65% according to the SQUASH questionnaire and 61% according to the Sensewear, with no significant difference between these two methods and a Cohen's Kappa of 0.379. The Sensewear data showed that the duration of moderate activities was 93 ± 87 min/day, the duration of vigorous to very vigorous activities was 4 ± 11 min/day and TEE was 2344 ± 538 kcal/day.
CONCLUSIONS: Following outcomes of both measures for physical activity, the majority of CABG patients was active and met the criteria of the Dutch national recommendations for physical activity. The study showed a fair agreement between the portable activity monitor Sensewear and the SQUASH questionnaire, showing a complementary value for both in this patient group.

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Treatment of acute type A aortic dissections combined with CABG and stenting of celiac artery

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BACKGROUND: In a surgical treatment of type A aortic dissection a long segment of the aorta often remain dissected. It is OFTEN combine with the organs malperfusion.
The aim of our study is to show a first clinical result of a combined surgical procedure.
METHODS: A 66-year-old man underwent aortic root replacement for acute type A aortic dissection, CABG and stenting of the caliac artery.
RESULTS: The average cardiopulmonary bypass duration was 157 min, aortic cross-clamp duration was 113 min. Postoperatively was developed non-specific abdominal pain, and the patient was treated with percutaneous stent placement in the dissected caliac artery.
CONCLUSIONS: Our study demonstrates feasibility of this combined procedure of aortic dissection. It thus appears logical to us to use this treatment in this type of abdominal malperfusion due to dissected aorta.

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Tricuspid annuloplasty and aortic valve replacement. A single-centre experience

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BACKGROUND: Aortic valve replacement with tricuspid annuloplasty (AVR+TA) is an uncommon procedure with few studies published.

The purpose of this study is to analyse and compare preoperative clinical variables, surgical outcomes and mortality in patients undergoing AVR+TA versus isolated aortic valve replacement (AVR).
METHODS: Retrospective study including all patients who underwent isolated AVR (N.=775) and AVR+TA (N.= 41) between October 1999 and February 2019.
RESULTS: We analysed preoperative cinical variables in both groups (AVR+TA *vs.* AVR) resulting in statistically significant differences (P<0.05) in female sex (58.5% *vs.* 43%), in chronic obstructive pulmonary disease (4.9% *vs.* 3.2%), in oral anticoagulant therapy (39% *vs.* 8.8%), in severe pulmonary hypertension (51.2% *vs.* 6.2%), in atrial fibrillation (63.4% *vs.* 20%), in III-IV NYHA functional class (53.6% *vs.* 32.3%), in moderate-severe left ventricular dysfunction (29.2% *vs.* 13.5%), in higher mean logistic EuroSCORE I (11.45 *vs.* 6.3), and in higher mean logistic EuroSCORE II (5.99 *vs.* 2.62).
Operative data were analysed finding statistically significant differences in longer mean cardiopulmonary bypass time, cross clamp time and ICU stay. No statistically significant differences were found in postoperative complications between both groups. Overall 30-day mortality was similar in both groups (2.4% *vs.* 3.7%) and no statistically significant difference was found. Multivariate logistic regression analysis was used to identify possible confounding factors in those patients who stayed longer in ICU (>60 h), finding only the obstructive pulmonary disease as an independent predictor for.
CONCLUSIONS: In comparation with the isolated aortc valve replacement (AVR) group, we found a higer preoperative risk (EuroSCORE I and II) in the AVR+TA group, resulting in longer surgical times and in longer ICU stay. Despite the fact that the preoperative risk was higher in the AVR+TA group, no statistically significant differences were found in postoperative complications or in 30-day mortality.

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Giant coronary artery aneurysm and valsalva aneurysm with fistulous connection to the right atrial

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BACKGROUND: Coronary artery aneurysms (CAAs) describe local dilatations in the coronary artery that are 1.5-fold greater than normal adjacent segments. Coronary aneurysms to be giants when the CAAs is >2cm. Sinus node arteryaneurysm combined with fistulous connection to the right atrium is an extremely rare finding.Herein we present a case that was managed surgically.
METHODS: A 60-year-old female patient was admitted to hospital with chest tightness for 2 years and syncope 4 times. The patient had no hypertension history. Electrocardiogram show that incomplete right bundle branch block (IRBBB). Cardiac Ultrasound reveal that left atrium: 40mm, right atrium: 49mm, Left ventricular systolic diameter: 44mm, EF 62%; The CT angiography was reported that left sinus of valsalva and left main coronary artery (LM) aneurysm, giant sinus artery aneurysm (90mm to 81mm in diameter), fistula between LM to sinus node artery (SNA) to right atrium. To prevent the rupture of aneurysm, we plan to reconstruction the aneurysm. After median sternotomy SNA extend below superior vena cava to right atrium and compress right atrium of superior vena cava, giant CAAs exceeding 90mm. We used cardiopulmonary bypasswith cannula in femoral artery and superior vena cave. At the beginning we transected the aorta and pulmonary artery, open SVA to LM, surgical removal of LCS and closured it, then reconstruction LCS of autologous pericardium patch. Later Transected LM, closured LM ostium, used great saphenous vein reconstruction the LM, anterior descending branch, circumflex branch. At last Closed Fistula.
RESULTS: After 2 weeks operative day the patient was discharged with full recovery with not having artery to atrium shunt and not IRBBB. A 1 year follow-up CT angiogram show without any new CAAs, patency rate of grafts were better.
CONCLUSIONS: Complex CAAs lesions can be reconstructed surgically, reconstruction should provides as much as possible routine approach for future coronary intervention.

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Transcatheter valve implantation in native mitral annular calcification

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BACKGROUND: We present a rare case of scleroderma with cutaneous calcinosis and Raynaud symdrome.
CASE REPORT: This 78 year old female was already treated with a transfemoral TAVI 2013, as she refused conventional surgery based on her underlying disease. In December 2018 she presented with congestive heart failure (154cm, 47 kg bodyweight), a logistic EuroSCORE-I of 43.2% and a severe mitral valve stenosis. Echocardiography revealed a mean gradient of 18mmHg. ECG-gated cardiac CT showed a nearly circular calcification of the mitral annulus with an area af 505mm² (minimum diameter 2,2cm, maximum diameter 3.5cm). She was treated with a 29mm Sapien 3 prothesis by a transapical approach. The postoperative course was prolonged due to renal replacement therapy. The patient was discharged to the rehabilitation center and is still in a good condition.

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Transapical transcatheter mitral valve valve-in-valve procedure using J-Valve in high-risk redo patients

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BACKGROUND: Redo patients with previously mitral valve replacement are always concomitant with high risks that invasive therapy is prohibition. With transcatheter technique, complex redo cases are suitable to treat. We first reported the experience that using J-Valve system as valve-in-valve for redo patients.
METHODS: 2 patients underwent transapical transcatheter mitral valve valve-in-valve procedure using J-Valve system. Case 1 was a 78-years-old male who received bioprosthetic mitral valve replacement 8 years ago and presented as severe mitral valve regurgitation with significant cardiac dysfuction. His preoperative STS score and Euroscore II was 4.9% and 4.8% but he was complicated with severe lung disease. Case 2 was a 57-years-old male bioprosthetic mitral valve replacement and coronary artery bypass graft 3 years ago. He is end-stage renal failure and need renal replacement therapy regularly. His valve was calcification and severe stenosis which induce hemodynamic unstable with high STS score (57.6%) and Euroscore II (49.5%). The two patients were all

received valve-in-valve procedure using J-Valve which was first reported. The procedure were through transapical, suitable size were measured based on the CT scan preoperative.
RESULTS: The technique success rate was 100% and two patients recovered well. No obvious para-valvular leak (larger than moderate) was observed and the flow rate were normal.
CONCLUSIONS: J-Valve system is an alternative option for mitral valve valve-in-valve procedure in high-risk redo patients.

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The wheat operation: role of 5 mm in postoperative aortic dilatation

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BACKGROUND: Aortic root (AR) dilatation after Wheat operation (WO) is to be considered in the long-term follow-up (LTFU). We aimed to identify predictor factors involved in this complication.
METHODS: 216 patients (150m/66f) underwent WO from June 2009 to April 2018. Mean echocardiographic LTFU 44.9 ± 22.2 months. Increase of 10% in AR size compared to the pre-operative baseline was the outcome variable. Statistical analysis used Student's *t*-test or chi - square test, Kaplan – Meier's analysis, and Cox's regression models. A p-value less than 0.05 was significant.
RESULTS: No significant differences among patients underwent aortic valve repair and aortic valve replacement (log rank = 0.917). In the group of valve replacement, AR dilatation was associated to difference between diameter of the prosthetic valve and diameter of straight vascular prosthesis (OR 0.87, P=0.024). Based on the difference in diameter between vascular and valve prosthesis we organized two groups. The small (S) N.=52, if the difference was ≤ 5 mm, and the large (L) N.=34 if the difference was > 5 mm. Using this grouping variable, significant AR dilatation was observed in 30.8 % of S and in 14.7 % of L (log rank = 0.026). A difference of more than 5 mm between aortic valve prosthesis and vascular prosthesis was protective for AR enlargement in the long-term FU (OR 12:31, P=0.033), even after adjustment for age and sex (OR 00:32, P=0.043).
CONCLUSIONS: The difference between size of aortic valve prosthesis and vascular prosthesis less than or equal to 5 mm appears to be the only factor associated with increased risk in AR dilatation after WO in the LTFU.

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Percutaneous femoral cannulation in minimally mitral valve surgery

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BACKGROUND: To investigate the applicability and safety of a percutaneous vascular closure device (MANTA) in patients who undergo surgery for mitral valve disorders.
METHODS: 10 consecutive patients scheduled for minimally invasive mitral valve surgery, were treated with percutaneous groin cannulation for installation of cardiopulmonary bypass in our hospital in February 2019. Cardiac arrest is routinely achieved by using intraaortic ballon clamping and insertion of the intraclude cannula (23 F). In all patients the arterial flow patterns of the right femoral artery were documented with transit time flow measurement (TTFM) and compared before and after cannulation.
RESULTS: The vascular closure was successful in all patients, complete hemostasis was achieved within 2 minutes. Femoral artery patency was confirmed by tissue Doppler.
CONCLUSIONS: The use of the MANTA device was safe and feasible in all mitral patients. Beside intraaortic ballon clamping and 3 D –Visualisation, percutaneous cannulation is another step towards less invasive surgery and avoids groin complications like lymphatic fistula.

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Impact of switch time between CTO crossing strategies

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BACKGROUND: There is still no clear time criterion for changing of initial crossing technique. The purpose of our study was to analyze the effect of switch time between crossing techniques on the procedural success CTO PCI.
METHODS: Between 2013 and 2017, 99 CTO PCI using both antegrade and retrograde strategies were performed in Meshalkin National Medical Research Center. In all cases crossover from antegrade to retrograde was implemented. To determine the threshold value, time was step-wise categorized and tested in the logistic regression. Median age was 58.9 ± 7.2 years, 13.1% were women. In most cases CTO target vessel was the right coronary artery the right coronary artery (71.7%), followed by the left anterior descending (18.2%) and circumflex (9.1%) arteries. The complexity of CTO's was classified using J-CTO score as easy (8.1%), intermediate (27.3%), difficult (28.3%), and very difficult (36.3%). The mean J-CTO score was 2.1 ± 1.1.
RESULTS: The threshold value of time to switch crossing technique was 33 min. Of the 66 patients with a time below 33 min, there were 53 cases (80.3%) of procedural success. By contrast, there were 18 (54.5%) cases of success among those with the switch time greater than 33 min. Therefore, the odds of procedural success with earlier switch were 3.4 times higher (95% CI: 1.3 to 8.6). The chances of success reduced by 3% for every 1 min longer the threshold value of time (95% CI 0.94 to 0.99, P=0.05). Mean procedure time was 62.3 ± 27.7 min. The average switch time between crossing strategies was 28.2 ± 16.9 min. On average, 1.8 ± 1.4 stent per patient was implanted.
CONCLUSIONS: Switch to the retrograde approach should be considered no later than after 33 minutes of the antegrade wire manipulation in order to maintain the maximum chances of final technical success.

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Cardiac valves prostheses thrombosis: management of treatment

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BACKGROUND: The thrombosis phenomenon and "pannus" thrombosis remains among the complications that require prompt intervention by cardiac surgery or thrombolysis.
METHODS: In the study group were included 1827 patients with val-

vular pathologies, operated (2007-2018) in Cardiovascular and Thoracic Surgery Department, Republican Clinical Hospital "T.Mosneaga", whom 1628 cardiac valves were implanted, of which 198 were biological prostheses and 1564 - mechanical prostheses. Prosthesis dysfunction due to thrombosis was found in 40 patients (2.2% of total patients) aged between 35 and 65 years. Surgical treatment underwent 13 patients. Thrombolysis was performed in 27 patients.
RESULTS: Of 27 cases undergoing thrombolysis with Alteplase and Reteplase, complete restoration of valvular prosthesis function was achieved in 23 patients; two lethal cases occurred (1 - hemorrhage, 1 - anaphylactic shock). In 2 cases of thrombolysis incomplete restoration of prosthesis function was obtained, but with hemodynamic improvement. This patients were successfully operated in two weeks.
CONCLUSIONS: Critical patients with valve prostheses thrombosis can be effectively resolved by applying thrombolysis drugs that can cure the patient completely or serve as a rescue procedure until surgical treatment for prosthesis replacement. Having low rate of embolic complications, thrombolysis can be implemented as a first-line treatment. In case of partial response to thrombolysis treatment the patient can be operated in satisfactory, low-risk hemodynamic conditions.

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Comparative prevalence of bovine arch and bicuspid aortic valve in proximal aorta disease

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BACKGROUND: Bicuspid aortic valve (BAV) is a known risk factor for thoracoabdominal aorta disease, whereas the role of bovine arch (BA) configuration is currently under investigation. The aim was to study the comparative prevalence of BAV and BA in patients undergoing surgery for Type A aortic dissection and proximal aortic aneurysms.
METHODS: The incidence of BA and BAV was studied in 142 patients who had elective or emergency surgery for proximal aorta disease in our institution between January 2016 and July 2018.
RESULTS: Male to female ratio was 1.73:1 (90 males and 52 females), the mean age was 63.2+/-12.7 years. Out of 142, there were 35 dissections (24.6%) and 107 (75.4%) aortic aneurysms. The incidence of BA was 22.5% (N.=32), with 20% (N.=7) of dissections and 23.4% (N.=25) of aortic aneurysms having this configuration. The incidence of BAV was 29.6% (N.=42); 92.9% (N.=39) of these patients had aortic aneurysms whereas 7.1% (N.=3) had dissections.
CONCLUSIONS: BAV was a frequent finding in patients with aortic aneurysms, whereas BA was just slightly prevalent in the same group, which provides a ground for further investigation of thoracic aorta anomalies.

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Prevalence of bovine arch in patients undergoing surgery for proximal aorta disease

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BACKGROUND: Bovine arch (BA) is an anomaly of the aortic arch denominating a two-vessel anatomy with a common origin of the brachiocephalic trunk and left common carotid artery, and it may predispose to aortic disease. Its incidence varies from 5%- 17%.
The aim of the study was to evaluate the prevalence of BA in patients undergoing emergency and elective surgery for proximal aorta disease and discriminate its prevalence in this category of patients.
METHODS: Between January 2016 and July 2018, 142 patients who had elective or emergency surgery for proximal aorta disease (aortic root, ascending aorta and aortic arch aneurysms or dissections) were investigated by the means of ECG-gated contrast computed tomography and analysed by radiologists and cardiothoracic surgeons.
RESULTS: In our series, male to female ratio was 1.73:1 (90 males, 52 females). Mean age was 63.2 +/- 12.7 years. Of 35 patients (24.6%) having surgery for acute dissection, 7 (20%) had BA. Of 107 patients (75.4%) with aortic aneurysms, 25 (23.4%) had BA.
CONCLUSIONS: BA was a frequent finding in aortic disease in our series, especially in a subcategory of patients with aortic aneurysms. Further investigation of its role in the treatment outcomes is needed.

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Independent risk factors of drug-eluting stent in-stent restenosis in short-term outcomes

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BACKGROUND: The mechanism and course of drug-eluting stent in-stent restenosis (DES-ISR) have not been fully clarified. Treatment of those patients remains a major challenge. The aim of this study was to determine the predictors for DES-ISR outcomes in short-term.
METHODS: A total of 250 patients those had initial stent implantation in our hospital and readmitted to receive treatment for the reason of recurrent significant DES-ISR in 2016 were involved. Patients were categorized as early ISR (<12 months; E-ISR; N.=32) and late ISR (≥12 months; L-ISR; N.=218). Associations between patient characteristics and clinical performance, as well as clinical outcomes after percutaneous coronary intervention (PCI) were evaluated. Primary composite endpoint of Major adverse cardiac events (MACE) included cardiac death, non-fatal myocardial infarction, or target lesion revascularization (TLR).
RESULTS: Most baseline characteristics were similar in both groups, except the period of ISR, initial pre-procedure TIMI, and some serum biochemical indicators. The incidence of MACE (37.5% *vs.* 5.5%; P<0.001) and TLR (37.5% *vs.* 5.0%; P<0.001) was higher in the E-ISR group. After multivariate analysis, E-ISR (odds ratio[OR], 13.267; [95% CI 4.984-35.311]; P<0.001) and left ventricular systolic dysfunction (odds ratio[OR], 6.317; [95% CI 1.145-34.843]; P=0.034) were the independent predictors for MACE among DES-ISR patients in short-term follow up of 6-12 months.
CONCLUSIONS: Early ISR and left ventricular systolic dysfunction were associated with the short-term outcome of MACE in DES-ISR patients. The results may benefit the risk stratification and secondary prevention after DES implantation in clinical practice.

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Cardiac valves prostheses thrombosis: management of treatment

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BACKGROUND: The thrombosis phenomenon and "pannus" thrombosis remains among the complications that require prompt intervention by cardiac surgery or thrombolysis.

METHODS: In the study group were included 1827 patients with valvular pathologies, operated (2007-2018) in Cardiovascular and Thoracic Surgery Department, Republican Clinical Hospital "T.Mosneaga", whom 1628 cardiac valves were implanted, of which 198 were biological prostheses and 1564 - mechanical prostheses. Prosthesis dysfunction due to thrombosis was found in 40 patients (2.2% of total patients) aged between 35 and 65 years. Surgical treatment underwent 13 patients. Thrombolysis was performed in 27 patients.
RESULTS: Of 27 cases undergoing thrombolysis with Alteplase and Reteplase, complete restoration of valvular prosthesis function was achieved in 23 patients; two lethal cases occurred (1 - hemorrhage, 1 - anaphylactic shock). In 2 cases of thrombolysis incomplete restoration of prosthesis function was obtained, but with hemodynamic improvement. This patients were successfully operated in two weeks.
CONCLUSIONS:Critical patients with valve prostheses thrombosis can be effectively resolved by applying thrombolysis drugs that can cure the patient completely or serve as a rescue procedure until surgical treatment for prosthesis replacement. Having low rate of embolic complications, thrombolysis can be implemented as a first-line treatment. In case of partial response to thrombolysis treatment the patient can be operated in satisfactory, low-risk hemodynamic conditions.

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Surgical strategies for children and adolescents with isolated aortic valve disease

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BACKGROUND: The optimal surgical strategy for isolated aortic valve disease (AVD) beyond the neonatal age remains controversial. In our Institution during previous years young children with aortic valve disease were treated with Ross operation, while the young adults had aortic valve replacement with mechanical valve (RMV). In the meantime new surgical options have evolved, the most important one being the Ozake procedure.
METHODS: All patients refereed for surgery with aortic valve disease, with the exception of neonates, treated between 2008. and 2018. at our department were reviewed regarding the mode of first treatment. mortality, morbidity and need for reintervention.
RESULTS: A total of 33 patients were indentified, 20 patients had previous interventional ballon valvuloplasty as first intervention. Mixed aortic valve disease was present in 23 patients, 10 patients had just aortic valve insufficiency. From the overall group 10 were treated with Ross operation, 10 with RMV and 13 underwent Ozake procedure. The average age at the operation was 12 years (range from 5-19 years), the mean follow-up period was 48 months (range 8–120 months). There were no deaths, freedom from reintervention during the study period was 97%. Left ventricle end diastolic dimension decreased significantly after the operations (average preoperative Z score 2.4, average postoperative Z score 0.34). After average follow up of 5 years in Ross patients the mean peak gradient across right ventricle outflow tract is 38 mm Hg with preserved function of the neoaortic valve.
CONCLUSIONS: Although a variety of treatment strategies for AVD exist, essentially no option can be considered as a definitively durable long-term solution if one considers the potential of a normal lifespan. Of the valve replacement options applied to small patients, the Ross procedure appears to be the most durable. The Ozake procedure seems like a promising alternative for RMV in older patients.

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Different modalities in treatment of pediatric haemangioma

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BACKGROUND: Hemangiomas are one of the most commonly encountered benign tumors in infants. It may be considered as the most common eyelid and orbital tumors of childhood. The current prospective study aimed to evaluate the effect of local propranolol gel in the treatment of infantile periorbital hemangioma.
METHODS: A prospective study took place in the period of 4 years from January 2012 to December 2016 on infants with periorbital hemangioma with a follow up period of at least one year. All infants underwent a fine needle histopathological sample. All patients who proved to be capillary hemangioma were divided into 2 groups. Group I, included those who were treated with topical timolol maleat gel from 4-30 weeks. On the other hand, group II included those who subjected to local corticosteroid therapy in the form of clobetasol 0.05% gel for a similar period. Post-therapy clinical and histopathological assessment took place in both groups. Obtained data were statistically analyzed.
RESULTS: Twenty-eight patients were enrolled in the study. They were 18 females and 10males with the ratio of females to males of about 2:1. In 21 infants, the tumor shrank in a period of 4 – 10 weeks after topical timolol administration. On the other hand, those who underwent local corticosteroid therapy showed a longer period for the shrinkage of the tumor $P<0.003$.
CONCLUSIONS: Local timolol gel therapy is superior to topical corticosteroid therapy with a wide range of safety and fewer side effects. Moreover, its cost-effectiveness is acceptable compared to other treatment modalities. The number of the study materials is limited, yet, it may be an indicator for a road map of managing the infantile periorbital hemangiomas. Further studies with a larger population may be needed, as the problem deserves full citizenship in the world of pediatric research.

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Cardiac surgery in pregnancy

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BACKGROUND: Management of pregnant women with heart disease who needs cardiac surgery, is still a challenging issue for health care providers.
METHODS: Our case is an obese 35 –years- old multigravida pregnant woman with gestational age of 38 weeks. She was hemodynamically stable with normal sinus rhythm and history of dyspnea on exertion (NYHA Class 3) since second trimester. Heart sound revealed normal with mild systolic murmur and near normal chest x-ray. The transthoracic echocardiography findings are: EF=50%, sever eccentric mitral regurgitation jet, mild left atrial enlargement. After onset of labor pain,

she was transferred to cardiac operating room. Heart surgery team was ready, in case of cardiac failure and pulmonary edema, mitral valve replacement would be performed immediately after delivery. After one hour induction, labor pain was arrested and caesarian section was done with optimal, closed and invasive cardiac monitoring without necessitating to mitral valve replacement. The neonate was a boy with good APGAR score. The postpartum course was uneventful.
RESULTS: Generally, few patients were treated without need to heart surgery but managing by medical treatment and careful care. Of course, 2 pregnant women with extensive pulmonary thromboembolism was medically treated with streptokinase, although eventually were expired resulting from cardiovascular collapse. In these cases there was no any consultation from cardiac surgeon for pulmonary thromboembolectomy.
CONCLUSIONS: Many pregnant cases with known heart disease are being managing non-surgically and have a good result and outcome for mother and her neonate. However, because of multidisciplinary management of cardiac problem during pregnancy, presence of a cardiac surgeon in this setting is mandatory and should be a part of teamworking in order to obtain a better outcome.

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The results of the left ventricle reconstruction with antimicrobial, thromboresistant patches 'BASEX'

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BACKGROUND: To demonstrate the successful use of "BASEX" patches with antimicrobial, thromboresistant, low porosity properties for geometric reconstruction(GR) of left ventricle(LV) following postinfarction left ventricular aneurysms of the heart.
METHODS: "BASEX" (Bokeria-Abdulgasanov-Spiridonov explants) patches is being manufactured and used in our center since 1997. Domestic textiles were subjected to various modifications for producing "BASEX" patches. Medical gelatin was used as a base for modifying its coating. To maintain the antimicrobial and thromboresistant properties of the coatings were introduced, antimicrobials (ciprofloxacin, metronidazole) anticoagulants(heparin), antiaggregants(acetylsalicylic acid, dipyridamole). GR LV using "BASEX" patches were done on 964 patients. In 25% of patients were additionally done mitral valve interventions.
RESULTS: Postoperative complications were observed in 18% patients. Major postoperative complications were CHF (21.6%), arrhythmias (22.9%) and neurological complications (8.9%). Mural thrombosis around the patch was observed in 4 (0.4%) patients. Thromboembolic complications were not observed. Infection of patch was observed in 3 (0.4%) patients. First patient suffered from sepsis due to post-injection abscess 2 years after surgery, was re-admitted in a terminal stage, autopsy revealed an abscess above the patch with penetration into pericardial cavity. Second patient complained of episodes of fevers 2 months after surgery, examinations revealed vegetations around the patch, patient refused to proposal for re-surgery. In third patient, infections were managed using conservative interventions.
CONCLUSIONS: Thus "BASEX" patches which demonstrated antimicrobial, thromboresistant, low-porosity properties can widely be used in reconstructive corrections of LV of heart.

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The relationship of the endothelial dysfunction and the severity of coronary artery disease

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BACKGROUND: Pulse amplitude tonometry (PAT) is a useful tool for the assessment of endothelial function expressed as reactive hyperemia index (RHI). The aim of this study was to identify the relation of endothelial dysfunction and the severity of coronary artery disease in the patients undergoing percutaneous coronary intervention (PCI).
METHODS: Data from 122 patients who underwent PAT and PCI were analyzed. We used Endo-PAT 2000® which is a kind of PAT. We investigated whether there is a relationship in endothelial dysfunction and the severity of coronary artery disease.
RESULTS: RHI values were 1.71±0.45, 1.65±0.43, and 1.57±0.51 in 1 vessel disease, 2 vessel disease and 3 vessel disease group, respectively. However, we could not find the statistical difference between three groups (P=0.382), although the more involvement of coronary vessels, the worse endothelial function numerically. Meanwhile, there was statistical difference in RHI value between left main disease group and no left main disease group (1.66±0.47 *vs.* 1.36±0.31; P=0.028)
CONCLUSIONS: There was no relationship between the endothelial dysfunction and the severity of coronary artery disease in the patients undergoing percutaneous coronary intervention. However, left main disease patients are likely to show worse endothelial function than no left main disease patients.

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Infection risk index in cardiac surgery score, an improvement in estimating surgical site infection risk

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BACKGROUND: Various scoring systems have been designed with the aim of predicting the risk of surgical site infection (SSI), their discriminatory abilities are limited. Our objectives were to assess the predictive power of the National Nosocomial Infections Surveillance, Australian Clinical Risk Index, and EuroSCORE and to design a new scoring system (using only preoperative variables) and compare its usefulness against the conventional systems.
METHODS: A prospective sample (n: 2,020) was divided into two periods. The first (2010–2014; n: 1,298) was used to design the scale, which was then validated against the other (2015–2017; n: 722).
RESULTS: In the logistic regression analysis diabetes mellitus (odds ratio [OR] = 3.3; 95% confidence level [CI]: 2–5.7), obesity (OR, 4.5; 95% CI: 2.2–9.3), and surgical duration (OR = 1; 95% CI: 1–1.01) were associated with SSI risk. The new score was constructed using only preoperative variables a summation system for punctuation by assigning one point to the presence of each variables. The incidence of SSI according to the IRIC categories were: IRIC-0, 2.5%; IRIC-1, 8.4%; and IRIC-2, 28.6 (c^2 test for trend = 40.44; $p < 0.05$). The area under the receiver-operating curve (aROC) of the IRIC index was 0.70 (95% CI: 0.63–0.78). This was compared with the aROC values for the other indexes, presenting a better power of discrimination.

CONCLUSIONS: The SSI risk discriminatory abilities of the conventional scoring systems are limited. By contrast, our proposed scoring system is more precise and simple and includes only a few preoperative variables.

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Atrial fibrillation in patients with atrial septal defect: catheter ablation the first step in treatment

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BACKGROUND: Atrial septal defects (ASDs) are the most common congenital cardiac abnormalities in adults. Patients frequently present with symptoms for the first time at adult age. One of the most common late complications of an ASD is the development of atrial tachyarrhythmias (ATs), especially atrial fibrillation (AF) and atrial flutter(AFl). This work studies and evaluates the longterm efficacy of AF ablation in patients with and without ASD.
METHODS: From July 2009 to December 2018, 38 consecutive patients were identified with unrepaired ASD medically refractory AF and an under catheter ablation. For each ASD patient, four control subjects were matched from our database.
RESULTS: There were no significant differences between groups in terms of age, sex, type and duration of AF, LA diameter, LVIDD, and EF. The mean procedural and fluoroscopy times were not different between the groups (P=NS). The 12±5 month period results showed, that the patients in the ASD group had 12.4 % AF recurrence. Twenty patients (51%) did not present any AF recurrence in a mean follow-up of months. Eighteen patients (46%) had at least one recurrence during outcome. No patient presented major complications. At the end of the follow-up, 35 (89%) patients remained in stable sinus rhythm with no AF recurrences after a single procedure, 50% of them without antiarrhythmic drugs after a single procedure compared with 18.2% in the control group (P=0.09)
CONCLUSIONS: These results exposed that radiofrequency ablation of AF is a safe and efficient procedure which is a rational strategy before percutaneous closure in patients with AF and ASD.

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Single centre experience with trans-apical and trans-femoral sapien aortic valve implantation

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BACKGROUND: Transcatheter aortic valve replacement is feasible option in treatment severe Symptomatic aortic stenosis in high risk patients. We retrospectively studied the outcomes of Transcatheter aortic valve replacement from 2009 to 2017.
METHODS: Retrospective analysis enrolling patients with severe symptomatic aortic stenosis and high surgical risk that underwent successful Transcatheter aortic valve replacement with self-expanding Edwards SAPIEN bioprosthesis at King Faisal Heart Centre from 01 August 2009 to 31 December 2017
RESULTS: One-hundred and twenty-seven high risk patient with severe symptomatic aortic stenosis were included in the study. The mean STS (Society of Thoracic Surgeons) score was 12.2 %.The trans-femoral approach was used in 81.9% and transapical approach was used in 18.1%. The survival rate was 96.85% at 30 days and 94.49 % at 1- year follow up. The rate of stroke was 3.15% and the rate for vascular complications was 14.17 %. the rate of paravalvular leak was 14.96 % at 30 days and 7.08 % at 1 year. The need of new pacemaker insertion at 30 days after the valve implantation was 6.3 %.
CONCLUSIONS: Transcatheter Aortic valve implantation can be accomplished safely and effectively in high risk patients with severe symptomatic aortic valve replacement and offer a feasible alternative for the surgical aortic valve replacement in this group.

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Alcohol septal ablation in patients with hypertrophic obstructive cardiomyopathy: the immediate and long-term results

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BACKGROUND: Many studies have evaluated the safety and efficacy of alcohol septal ablation(ASA) in symptomatic patients with hypertrophic obstructive cardiomyopathy(HOCM), although there are still no randomised trials, transcatheter ASA is a viable alternative for patients with HOCM.
METHODS: From 2009 to 2018 138 ASA performed in 129 patients (81 males, 48 females) with HOCM at our center. Mean age of pts. was 41 [6;77] years. All pts. had right ventricle pacing lead with pacemaker backup and myocardial contrast ECHO(MCE) before procedure. Mean peak pressure gradient(PG) on LVOT was 91,7 ± 8,3 mm. Hg. Mitral valve regurgitation (MR) from moderate to severe was in all pts. Mean interventricular septum thickness was 2,5cm [1,6; 3,7].
RESULTS: Mean PG on LVOT decreased from 91,7 ± 8,3 mmHg to 32,4±4,8 mmHg. The grade of MR reduced from at least moderate to mild or even trivial.The procedure – related mortality was 1,4%. In 3 cases (2,2%) the procedure was aborted by the MCE data. Mean follow up for 129pts(100%)was 71±4,7 months. 101(78,3%) pts had PG reduction (to ≤30 mmHg) – regarded as good result of procedure. 17(13,2%) pts had PG > 30mmHg, but significant improvement in symptoms. Long term mortality in ASA pts. was 1,5%. 9(7%) pts needed redo procedure due to residual LVOTO, which was effective. 13(9,4%) patients had complete AV block and required permanent pacemaker. Mean interventricular wall thickness decreased from 2,5±0,4cm to 1,8±0,1cm. MR decreased from at least moderate to mild or complete disappearance. NYHA class reduced from 2,9 to 1,1.
CONCLUSIONS: ASA is effective and safe method of HOCM treatment. The reduction of the duration of the procedure, decreasing of the number of the complications and general improvement of the results of interventional HOCM treatment are possible with accumulation of the experience.
KEYWORDS: Alcohol septal ablation, Long-term follow up.

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Interventional treatment optimization in patients with recurrent angina after coronary artery bypass grafting

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BACKGROUND: This study was designed to assess the efficacy and improve the methods of percutaneous treatment in patients with recurrent angina (RA) after coronary artery bypass grafting(CABG).

METHODS: The study group of 250 patients with RA occurred at different times after the initial CABG (from 0.25 to 96 months) represented 3.4% of the total number of cases of isolated CAD (N.= 7452). Among the re-examined, there were 218 men (87.2%) and 32 women (12.8%). The mean age of patients was 58.1 + 8.2 years (from 33 to 78 years). According to the results of the intervention all 250 patients in the main group were divided into three subgroups: 123 pts had percutaneous coronary intervention (PCI), 11 pts had redo CABG, 116 pts had optimized drug treatment (ODT).
RESULTS: According to the developed indications in the main group of patients with RA 123 percutaneous coronary intervention(PCI) were performed. 92 pts (74.8%) of them had interventions on native CA, 11 pts (8.9%) – on grafts, 18 pts (14.6%) -on both – native CA and grafts respectively. An intravascular ultrasound (IVUS) and determination of the fractional flow reserve (FFR) in complex SVG interventions have been used. The results of these techniques, the role of IVUS and FFR in these interventions have been studied.Direct stenting and "undersized" stent selection strategies in the SVG interventions have been applied.
CONCLUSIONS: PCI on native grafted vessels is usually preferred over PCI on SVG based on the best outcomes and lower risk of major adverse cardiac events (MACE).The aids like IVUS and FFR helps to make the decision concerning the necessity of PCI in patients with RA after CABG in the controversial cases and to avoid the unreasonable PCI on SVG.The revascularization strategy must be based on careful risk/benefit assessment of the procedure and the local experience.

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Double patch repair of primary aorta-right atrial fistula: video presentation

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BACKGROUND: Aorta-right atrial fistula is as a shunt generally secondary to other pathologies or interventions as a complication. Primary aorta-right atrial fistula is a very rare clinical entity which necessitates surgical or percutaneous closure depending the localisation and preoperative status of the patient in order to prevent the heart failure and development of pulmonary hypertension.
METHODS: 38 years old male patient without particular health problems except morbid obesity (BMI: 36) admitted to our hospital with an inaugural shortness of breath. Trans-thoracic echocardiography revealed an eccentric- moderate aortic valve regurgitation with a suspicious flow between aortic root and right atrium. Trans-oesophageal echocardiography confirmed the presence of aorta-right atrial fistula with discrete to moderate aortic valve regurgitation. The patient is scheduled for an urgent surgery with a suspicion of bacterial endocarditis.
RESULTS: We observed that aortic root was normal without having any suspicion concerning infective endocarditis during surgery. The aorta-right atrial fistula was localised next to the non- coronary, right-coronary-commissure at the bottom of the aortic root. Following resection of the fibrotic funnel of the fistula, the connection is repaired with double bovine-pericardial-patch on the aortic and right atrial sides. Perioperative echocardiography confirmed complete closure without a residual aortic valve regurgitation. The patient developed post-operatively 3rd degree atria-ventricular block which was treated with AV endo-venous pacemaker implantation. The surgical sample was sent to the pathology and bacteriology analyses did not prove any infectious origin. The patient was discharged at 9th postoperative day with good conditions.
CONCLUSIONS: Although secondary aorta-right atrial fistula is well known complication to sinus of Valsalva aneurysm, infective endocarditis, aortic valve replacement or TAVI, primary aorta-right atrial fistula is not published in the literature frequently. Surgical treatment is well defined treatment, but percutaneous closure also could be an option for morbid patients without having infectious origins.

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Postoperative atrial fibrillation after coronary artery bypass grafting in patients with obstructive sleep apnea

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BACKGROUND: Obstructive sleep apnea (OSA) is an independent risk factor for the development of atrial fibrillation. The study evaluated frequency of postoperative atrial fibrillation after coronary artery bypass grafting (CABG) in patients with OSA.
METHODS: A 32 patients scheduled for a CABG were routinely evaluated for age, gender, body mass index (BMI), clinical examination, 24-hour cardio-respiratory monitoring (CRM), blood tests and medications. In the postoperative period, bedside monitoring was performed about paroxysms of AF. CRM was repeated and performed on the third day.
RESULTS: Patients were divided into two groups: 1st group (OSA_0) - 17 patients with apnea / hypopnea index (AHI) <15 / hour, 2nd group (OSA_1) - 15 patients with AHI >15 / hour. In all patients with initial respiratory disturbances in sleep, an increase in AHI after surgery was observed. Paroxysms of atrial fibrillation appeared in 11 patients: one patient from OSA_0 group and ten patients from OSA_1 group (P<0,05).
CONCLUSIONS: This study showed that development of postoperative atrial fibrillation is more frequent in patients with severe or moderate OSA despite the fact of using standard antiarrhythmic therapy in all the patients.

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Influence of meteorological conditions on the incidence of acute type A aortic dissections

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BACKGROUND: Acute aortic dissection (AAD) is the most common clinical catastrophe involving the aorta. AAD incidence was estimated as 10-20 cases per million per year. Although some risk factors for AAD are well known (such as arterial hypertension, bicuspid aortic valve, aortic coarctation, connective tissue disorders or Turner´s syndrome) others are still unknown. Some recent research suggest the influence of environmental factors.
METHODS: We enrolled 79 patients undergoing surgery because of acute type A aortic dissection, from October 1999 to August 2018. We reviewed all clinical records and these data were confronted with meteorological data provided by the Agencia Española de Metereología (AEMET) and classified by month and season.
RESULTS: The frequency of ADD was higher in December and June than May and August (P value = 0,043). We registered more cases in spring and autumn than summer and winter, although without statistical

significance. In addition, the variations of atmospheric temperatures and pressures during 24 hours before the event were correlated with ADD occurrence. Oscillations greater than 10 ºC in temperature (77% of patients, P value= 0,008) and lesser than 5 mP in pressure (64% and P value < 0,001) were associated with more risk of dissection.
CONCLUSIONS: Our results confirm that ADD occurrence has monthly variations and possibly seasonal variations. This temporality in ADD incidence could be due to the temperature and pressure atmospheric variations. Further studies would be necessary to confirm this hypothesis.

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Pharmacological activation of soluble guanylate cyclase improves vascular graft function

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BACKGROUND: Oxidative stress interferes with nitric oxide (NO)/soluble guanylate cyclase (sGC)/cyclic guanosine monophosphate (cGMP) signalling pathway through reduction of endogenous NO and formation of peroxynitrite and leads to vascular dysfunction. We assessed the hypothesis that the sGC activator cinaciguat would protect vascular graft against IR injury in the vessel wall of the bypass graft.
METHODS: Lewis rats (N.=6-8/group) were divided into 3 groups: group 1:control, group 2:donor rats received intravenous saline, group 3:received intravenous cinaciguat (10 μg/kg) 2h before explantation. Whereas aortic arches of group 1 were immediately mounted in organ bath, aortic segments of groups 2 and 3 were stored for 2h in saline and transplanted into the abdominal aorta of the recipient. Two hours after transplantation, the implanted grafts were harvested. Endothelium-dependent and -independent vasorelaxations were investigated. TUNEL, CD-31, caspase-3, nitrotyrosine immunochemistry were also performed.
RESULTS: Compared with control, saline group showed significantly attenuated endothelium-dependent maximal relaxation (Rmax) 2h after reperfusion, which was significantly improved by cinaciguat supplementation (Rmax control: 91±2%, saline: 41±2% *vs.* cinaciguat: 55±2%, $P<0.05$). Cinaciguat-pretreatment significantly reduced DNA-fragmentation, nitro-oxidative stress, decreased caspase-3 score. The marker for endothelial integrity (CD-31) was also higher in the cinaciguat group.
CONCLUSIONS: Our results support the view that impairment of the intracellular cGMP-signalling plays a role in the pathogenesis of the endothelial dysfunction of arterial graft after bypass surgery, which can effectively be prevented by cinaciguat. Its clinical use as preconditioning drug could be a novel approach in vascular/cardiac surgery.

1
A successful staged approach for treatment of concomitant mitral endocarditis and mycotic aneurysm

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BACKGROUND: Mycotic aneurysms pose significant risk of rupture and subsequent mortality. Repair of aortic mycotic aneurysms via endovascular approach has not been described in the context of mitral endocarditis. We describe a unique case that demonstrates the feasibility of applying a staged endovascular approach of mycotic aneurysm repair with subsequent open mitral valve replacement.
CASE REPORT: A 78 year-old gentleman presented with bacteremia and 10 days of shoulder and chest pain. His past medical history includes diabetes, hypertension, and chronic lower back pain after spinal fractures. Electrocardiogram revealed right heart strain, and computed tomography angiogram demonstrated a 5.0 x 4.2 x 1.8 cm pseudoaneurysm of the descending thoracic aorta. Echocardiogram revealed mitral vegetations with severe mitral regurgitation and preserved left ventricular ejection fraction. Blood cultures grew Streptococcus Gallolyticus. Magnetic resonance imaging of the brain and spine revealed punctate hemorrhage in the brain and osteomyelitis of L4/L5, confirming septic emboli from valvular endocarditis.
After 6 weeks of antibiotic therapy and repeat negative blood cultures, elective surgery was planned. Due to severe mitral insufficiency, we offered elective pseudoaneurysm repair with TEVAR. We deployed a 32x109mm thoracic endovascular graft with 50% coverage of the left subclavian artery. No flow into the aneurysm sack was noted at the end of the procedure. The patient tolerated the procedure well, had an uneventful recovery, and was discharged home on postoperative day 4 with lifelong suppressive oral antibiotics. Despite maximum medical management, six months following TEVAR he developed refractory shortness of breath from mitral insufficiency. He was therefore scheduled for open surgical mitral valve replacement with a bovine pericardial valve. The surgery was uncomplicated and made a full recovery. At 24-month follow-up, he reports good antibiotic compliance and repeat blood cultures were negative; surveillance computed tomography angiogram shows no evidence of endoleak.

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The role of regional anesthesia at patients with combined atherosclerotic lesions of carotid and coronary arteries

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BACKGROUND: To study the results of carotid endarterectomy (CEA) under regional anesthesia.
METHODS: the results of CEA performed under regional anesthesia in 122 patients were analyzed. Of these, 48 patients had atherosclerotic lesions of CaA and CoA. The patients were aged 41 to 88 years, the average age of patients was 57 ± 7,8 years. There were 90 men (74%). All patients had stenotic lesions of the CaA.
Regional blockade was performed as standard. Indications to regional anesthesia were severe lesions of the CoA, and various concomitant diseases: Chronic ischemia of the lower extremities-12.3%; Diabetes mellitus-26,3%; Cirrhosis of the liver-2,5%; COPD-18%; Hypertension-94%; chronic calculous cholecystitis-10%; Diaphragmal hernia-0.8%. Te following operations were performed: Classic CEA with autovenous patch-49(40%), eversion CEA-37(30%), resection of the ICA with reimplantation-29 (24%), resection and ligation of the ICA, endarterectomy from the CCA and ECA -7 (6.0%).
RESULTS: Of the 122 CEA operations under regional anesthesia, no case required a switch to intubation and general anesthesia. In 16 (19.5%) patients during intraoperative clamping of CaA there were a neurologic symptoms in the hemisphere of the operated side. The operation was continued with temporary intra-arterial shunt, therefore the neurological deficit was completely restored. In 2 (2.4%) cases, a minor stroke developed during carotid endarterectomy. The use of regional anesthesia prevented from acute myocardial infarction and other cardiac complications. The refusal of intubation anesthesia made it possible to avoid such complications of the early postoperative period as hospital pneumonia and prolonged ventilation. Stroke in the ipsilateral side was 0.8%, stroke in the contralateral side-0%, Stroke+Mortality-0%, AMI-0%.
CONCLUSIONS: The use of regional anesthesia at patients with concomitant atherosclerosis of CaA and CoA leads to a significant reduction in anesthetic risk, cerebral, pulmonary and cardiac complications.

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Normothermic aortic arch replacement in patients with Type A aortic dissection without circulatory arrest

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BACKGROUND: The aim of this case series is to present a surgical technique, in which, the aortic arch is partially replaced on cardio pulmonary by-pass(CPB) in normothermia without circulatory arrest.
METHODS: We present a series of 5 patients with acute aortic dissection operated in our clinic in 2018. CPB was established in the usual fashion, but we used one main arterial line and a secondary arterial line with two branches. The main arterial line was used to provide the body's perfusion and the secondary arterial line the cerebral perfusion. We measured the flow and the pressure separately for both branches of the accessory line. The ascending aorta was cross-clamped and Custodiol cardioplegia solution was administered. Another arterial clamp was positioned on the descending aorta and the aortic arch was excised. The brain was protected with normothermic blood using anterograde perfusion with monitoring of the cerebral oxygenation through near-infrared spectroscopy (NIRS). Firstly we performed the distal anastomosis between the 4-branched woven Dacron prosthesis and the descending aorta, after that, the proximal anastomosis between the remaining end of the prosthetic graft and the ascending aorta. Finally, two branches of the prosthesis were anastomosed with the carotid and the innominate artery.
RESULTS: Mortality rate for this case series was 0. Postoperative, none of the patients exhibit any neurological symptoms, nor haematological, hepatic, renal impairment. Mean thoracic drainage was of 650 ml on the first day. Intensive care unit stay was between 6 and 10 days.
CONCLUSIONS: Normothermic aortic arch replacement without circulatory arrest in carefully selected patients can be a safe and useful technique only in conjunction with normothermic perfusion of the brain. This technique shortens the total time of surgery and minimizes the risk of complications associated with circulatory arrest, mainly clotting disorders and visceral ischemia.

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Rupture of abdominal aortic aneurysm after endovascular repair

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BACKGROUND: Aneurysm implies a local segmental permanent extension of the blood vessel, with all layers, for more than 50% of the usual diameter for the examined segment and is treated with endovascular stent-graft and open surgery. Endovascular treatment of aneurysm of abdominal aorta with stent-graft (EVAR) has become popular as elective treatment, but one of the complications is further increasing the aneurysm diameter that can lead to rupture.
METHODS: This case series is an overview of open reconstructive surgery in the case of aneurysm rupture of the abdominal aorta in three patients treated endovascular in the first act, and diametar of aneurysm increased because of endoleak and migration of grafts and finish with rupture. Because of the inability to extract the stent-graft in two patients, it was cut transverse through with the scissors at the proximal part where the upper anastomosis of Dacron graft prothesis has been created.
CONCLUSIONS: Regular yearly controls until the end of patients lives have a great importance in order to avoid fatal complications after EVAR. One of the methods after the abdominal aortic rupture after endovascular stent-graft treatment that significantly shortens the duration of the operation and gives a more stable upper anastomosis, is transverse cutting the stent-graft with scissors in the proximal part. Complete prevention will remain a challenge because rupture can occur even if we cant see the abnormalitys. The ultimate goal is to increase the percentage of survival after the rupture of aneurysm of the abdominal aorta.

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Endovascular treatment of penetrating aortic ulcer

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BACKGROUND: Penetrating aortic ulcer is a disease that affects the aortic wall, and can be clinically presented as asymptomatic and symptomatic in the form of pain of varying intensity. It initially affects only the intima of the aorta, and later with the development of the disease, the ulcer penetrates into the middle layer that can lead to rupture. Endovascular aortic reconstruction is an procedure that is less invasive than a conventional open surgical approach, thus avoiding many of the consequences and complications that are present in open surgical approach and is a very successful method in treating a penetrant aortic ulcer.
METHODS: This case is an overview of the endovascular aortic reconstruction in a patient of 51 years of age with numerous comorbidities, for the treatment of penetrant aortic ulcer. The patient had previously complained of back pain and was mistakenly led under the diagnosis of lumbar syndrome. After the diagnosis, the penetrant aortic ulcer was confirmed, as well as the high risk for an open surgical procedure, we indicated the endovascular reconstruction that has gone smoothly. The revascularization effect was satisfactory, the patient had no pain anymore after procedure. On the control CT angiography done within a month, six months and a year after the procedure, the correct position and functionality of the endovascular stent graft, as well as the absence of a penetrant ulcer of the aorta, was established.
CONCLUSIONS: Early and detailed diagnosis plays an important role in avoiding temporary and permanent complications in the penetrant aortic ulcer. Endovascular treatment is less invasive than conventional open surgery and is followed by a potentially lower degree of complication. Translumal setting of endovascular stent grafts for the treatment of penetrant aortic ulcer is a very successful treatment method and alternative to conventional surgery.

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Infected pseudoaneurysm as a results of continuous recurrent occlusion of revascularized SFA

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BACKGROUND: Endovascular approaches and/ or open surgery for PAOD revealed many of morbidities such as occlusion, bleeding, infection, and etc. Now we are presenting a very complicated PAOD patient who had infected pseudoaneurysm as a results of continuous recurrent occlusion of revascularized SFA as well as many other complications.
METHODS: The male patient had performed endovascular revascularization on left SFA due to severe claudication when he was 80 years old. However, he showed continuous recurrent occlusion on revascularized SFA. Therefore, we had tried several times of endovascular revascularization again and again for three years, but in vain. After then, he also had conducted several times of open surgery for revascularization for consecutive two years. In spite of our efforts, he finally showed septic condition caused by infected pseudoaneurysm and in-graft vegetations.
RESULTS: The emergency operations for septic condition was performed uneventfully. However, he was suffered from GI bleeding, AKI and pneumonia during final postoperative period. But he was recovered from sepsis gradually and succeeded in limb salvage fortunately.
CONCLUSIONS: Although it is a very hard processes to treat morbidities of PAOD such as graft infection, we can overcome them with active endeavor.

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Management of extremity venous thrombosis in neonates and infants: an experience from resource challenged settings

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BACKGROUND: We aimed to evaluate the outcome of different treatment modalities for extremity venous thrombosis in neonates and infants, highlighting the current debate on their best tool of management.
METHODS: This retrospective study took place over a 9-year period from January 2009 to December 2017. All treated patients were referred to the vascular and pediatric surgery departments from the neonatal intensive care unit. All patients underwent a thorough history-taking as well as general clinical and local examination of the affected limb. Patients were divided into two groups, group I included those who underwent a conservative treated with the sole administration of unfractionated heparin (UFH), whereas group II included those who were treated with UFH plus warfarin.
RESULTS: Sixty-three patients were included in this study. They were 36 males and 27 females. Their age ranged from 3 to 302 days. Forty one (65%) patients had venous thrombosis in the upper limb, whereas the remaining 22 (35%) had lower extremity venous thrombosis. The success

rate of the non-surgical treatment was accomplished in 81% of patients. The remaining 19% underwent limb severing, due to established gangrene. The Kaplan-Meier survival method revealed a highly significant increase in both mean and median survival times in those groups treated with heparin and warfarin compared to heparin-only group (P<.001).
CONCLUSIONS: Nonoperative treatment with anticoagulation or observation (*i.e.* wait-and-see policy) alone may be an easily applicable, effective, and a safe modality for management of venous thrombosis in neonates and infants, especially in developing countries with poor or highly challenged resource settings.

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Challenges in the management of primary varicose veins: what is the best treatment option

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BACKGROUND: Varicose vein is considered as one of the commonly practiced venous problems for decades not only by vascular surgeons but also by general surgeons. The purpose of the current study was to compare the results of management of lower limb superficial varicosities using conventional surgery versus endovenous laser ablation (EVLA) therapy.
METHODS: A retrospective study took place in the period of three years from January 2015 until December 2017. Patients were selected for having reflux of the great saphenous vein (GSV) with primary varicosities of the lower limb presenting to the vascular surgery clinic. Patients were divided into two groups; group I included those who were treated with GSV short stripping and saphenofemoral junction disconnection, whereas group II involved patients who underwent EVLA.
RESULTS: The study included 80 patients. There were 50 females and 30 males, with a female to male ratio of 5:3. Patients' age ranged from 22 to 44 years, with median age of 34 years. There was a significantly higher initial technical success rate of 95% (N.=38) in the group treated with EVLA versus 90% (N.=36) in the group treated surgically (P=0.006). Operative outcome was statistically significantly higher in the group treated with EVLA compared with the surgically treated group (P=0.002). A significant difference between operative procedures versus operative outcome was seen (P=0.002). Recurrent varicosities were observed in 10% and 5% in group I and group II, respectively. Heat-induced deep vein thrombosis was reported in 2.5% of cases.
CONCLUSIONS: Conclusion Treatment of superficial varicosities with EVLA had a lower incidence recurrence rate than traditional surgery in the short-term follow-up. Moreover, the minimally invasive EVLA therapy, especially, in female patients seems to be a highly effective and safe modality for treatment of primary GSV varicosities.

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Off-Protocol 'CRRT' solution of Iatrogenic complete obstruction of the inferior vena cava

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BACKGROUND:Complete obstruction of inferior vena cava is a deadly complication. Here in we represent a case with a iatrogenic complete obstruction of the inferior vena cava treated in the ICU, with CRRT device.
METHODS: A 68-year-old male patient presented an abdominal aortic aneurysm 6cm. He underwent abdominal aneurysm repair. During the operation, the inferior vena cava was accidentally perforated. Given the emergency of this life-threatening condition, it was impossible for the surgical team to stich the perforation and correct the complication. Inferior vena cava was ligated in order to stop the bleeding. Complete obstruction of the venous flow found our patient's collateral veins unrepaired, and therefore unable to perform adequate drainage of the blood from the lower extremities, resulting in inadequate preload and the following hypovolemic shock. We found a practical, off-protocol CRRT solution to this critical case in the first hours in ICU. We inserted central venous catheter in left femoral vein access CRRT device and connected left subclavian vein return from CRRT device to the patient. The gradient between inferior and superior vena cava was present during veins cannulation.
RESULTS: Clinical results were almost immediate, AP 95-110/60 mmhg, FC 90-100 hb/min, diuresis 80-100 ml/h, no metabolic acidosis, less support of cristaloid solution, PNF, blood transfusion and albumine, less inotropic support. Meanwhile the collateral veins had time to develop a greater capacity and compensate the venous obstruction.
CONCLUSIONS: We found CRRT device with 200 ml/min flow a very good temporary solution of this deadly complication and we believe that it can be employed in other similar cases.

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Medicolegal and clinical aspects of peripheral vascular injuries: a retrospective study

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BACKGROUND: Vascular trauma is one of the devastating types of injuries whether accidental or intentional. Despite this fact, there is an obvious deficiency in the educational sessions for vascular surgeons concerning the appropriate medicolegal dealing with such injuries. Aim: To report the experience of vascular limb trauma highlighting the medicolegal and clinical findings.
METHODS: A 5-years retrospective study with a follow-up period of 1.5 years duration retrieving the data of peripheral vascular injuries at three specialized trauma centers with special emphasize on the cause, the type, and the outcome in relation to sociodemographic factors.
RESULTS: This study included 350 trauma patients (287 males and 63 females) who presented with peripheral vascular injuries. The patients' age ranged from 8-50 years old. There was a significant association between the age and the circumstances of trauma. The most encountered causative mechanisms were traffic accidents (45.7%) and firearms (21.7%). There was no significant association between outcome and age (P=0.114) or circumstances of trauma (P=0.208). There was a highly significant association between the outcome and the duration of hospital stay (P<0.001). Lower limb injuries were higher in frequency than upper limb injuries (N.=286 and 123) respectively. Upper and lower limbs arterial injuries had a significantly higher frequency rate than the venous injuries. Ulnar artery and brachial vein injuries were the most frequently encountered upper limb arterial and venous trauma, while the femoral artery and the deep femoral vein were the most commonly affected lower limb vessels. Bone injuries were the most frequently accompanying injuries (44.6% of total cases).

CONCLUSIONS: As any sort of injury may possess medical and lawful perspectives, medicolegal investigations have to take the crown's position when studying trauma cases, going hand in hand with the clinical aspect.

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Large idiopathic pseudoaneurysm of the popliteal artery

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BACKGROUND: Pseudoaneurysm, also known as "false" aneurysm, is when blood passes through individual layers of the blood vessel or through all layers but its retained by surrounding soft tissues. The most common cause of pseudoaneurysm is trauma, infection and previous medical procedures, but there are rare cases where the cause was not found.
METHODS: This case presents a reconstructive surgery in a case of a large idiopathic pseudaneurysm of the second segment of the popliteal artery in a patient aged 41, sent by an orthopedist with a Magnetic Resonance of the left leg. Anamnestic with the beginning of pain three weeks ago, and the tissue swelling in the left popliteal fossa for about 6 months, and a large, painful, nonpulsative tumefaction was dominant during the examination, resulting a 90 degrees flexible contracture of the left knee. The magnetic resonance showed pseudoaneurysm of the left popliteal artery, and an urgent Computed Tomography angiography was performed which confirmed pseudoaneurysm of the second segment of the left popliteal artery of the left leg without signs of obliterative diseases. The posterior approach and exposition of the popliteal artery was applied, and with great saphenous vein of the right leg, an autovein graft interposition was made.
CONCLUSIONS: Early diagnosis plays an important role in avoiding temporary and permanent complications. Arterial reconstruction with autovein graft is a gold standard and a method of choice in the surgery of the pseudaneurysm of the popliteal artery. The temporary setting of occlusive Fogarti catheters reduces damage to surrounding tissue, accelerates bleeding control, which together shortens the time of surgery.

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Significance of late surgical treatment of symptomatic unruptured aneurysm of abdominal aorta

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BACKGROUND: Aneurysm of the abdominal aorta represents a permanent focal dilation of the blood vessel wall about 1.5 times larger than the normal diameter. It can be clinically divided into symptomatic and asymptomatic.
Detailed analysis of the results of the symptomatic unruptured aneurysm following the association of the diameter between ruptured and unruptured symptomatic aneurysm, and defining the influence of the time elapsed from receiving the patient to the operation on the outcome of the operation procedure itself.
METHODS: All 133 patients who underwent surgery due to symptomatic unruptured and ruptured abdominal aneurysm during the previous 3 years were retrospectively analyzed. Results: From total of 133 patients 75.19% were operated in the first 24 hours of reception, while the rest 24.81% patient were operated later. Intraoperative complications only had patients with ruptured aneurysms, 4% of cardiac arrest and 1.5% of letal outcome. Mortality during hospitalization in patients with unruptured aneurysm of the abdominal aorta operated in the first 24 hours is 16.67%, and in patients who are operated after 24 hours, it is 9.91%.
CONCLUSIONS: Early elective surgery is a method of choice for the treatment of symptomatic unruptured aneurysm of the abdominal aorta, with the fact that the operation in the first 24 hours has a higher mortality rate than after 24 hours of receiving the patient. Also, there is no statistically significant difference in the diameter of ruptured and unruptured symptomatic aneurysms, but the average value of the aneurysm diameter is higher in ruptured, which confirms the claim that with the increase in diameters the frequency of rupture aneurysms increases as well.

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Hybrid repair for dissection with right aortic arch with Kommerell diverticulum

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BACKGROUND: Right aortic arch with aberrant left subclavian artery and Kommerell diverticulum is a rare and complex situation. Acute type B dissection in the setting of this anatomical variation is a great challenge. We present a case of hybrid repair and discuss the surgical option choice.
METHODS: One 58-years-old patient suffered acute chest pain and was diagnosed as acute type B aortic dissection by the CT scan. Coincidentally, the patient is presenting as right aortic arch with aberrant left subclavian artery and Kommerell diverticulum. The primary intimal entry was located near the Kommerell diverticulum. We discussed the surgical approach and finally decided to use a hybrid surgery method. The aortic arch was revealed by a midline incision, and we reconstructed the innominate artery and the left common carotid artery with the artificial blood vessel bypass from ascending aorta. After that, left axillary-left carotid artery bypass was done through the supraclavicular incision. And then we used the stent device to cover the dissection. Finally, in order to avoid endoleak, the starting end of the left subclavian artery is embolized with plugs.
RESULTS: The patient recovered well and the postoperative period was uneventfully. The rechecked CT scan revealed good results without endoleak and great aorta reshape.
CONCLUSIONS: Hybrid method is one acceptable and reliable approach to resolve the complex situation.

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A two stage approach for an abdominal and a thoracic aortic aneurysm

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BACKGROUND: Treatment of extended aneurysmatic disease demands in some cases a two-stage approach, ensuring the collateral circulation. Our aim is to present a case of a rapidly expanding abdominal

(AAA), extended to the iliac arteries, and a thoracic aortic aneurysm (TAA) treated in two stages.
METHODS: A 67-year old male patient has been under surveillance for a 4.5cm abdominal aortic aneurysm. During his last visit, a computed tomography angiography (CTA) revealed a rapidly expanding 5.7cm AAA, (more than 1cm during 12 months) extending to the common iliac arteries and a descending aorta aneurysm (TAA) of 4.1cm. An endovascular treatment of the AAA and a preservative surveillance of the TAA was decided.
RESULTS: A bifurcated endograft with an iliac branch device for the preservation of the left internal iliac artery (IIA) and a concomitant coiling of the right IAA was used to ensure the complete seal of the aneurysm. During 1st month follow-up, an occlusion of the iliac branch and a simultaneous TAA expansion was revealed. A close follow-up was proposed for the TAA each 6 months. In 18-month follow-up, its diameter was 6.1cm and a surgical treatment was indicated. In order to prevent paraplegia because of the prior EVAR and the occlusion of both IIAs, a right external to internal iliac artery bypass using a PTFE graft was performed. Twenty days later, under cerebrospinal fluid drainage perioperatively, thoracic endograft was used to treat the TAA. The patient recovered with no complication. First-year follow-up revealed no complication.
CONCLUSIONS: Concomitant thoracic and abdominal aortic aneurysm demands a careful preoperative planning. Preservation of the collateral circulation and cerebrospinal fluid drainage are mandatory in the prevention of spinal cord ischemia and paraplegia. A two stage approach seems a safe option for these patients.

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Sandwich technique with proximal extension for a thoracoabdominal aneurysm

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BACKGROUND: The endovascular approach of thoracoabdominal aneurysms (TAAA) is still challenging. Sandwich technique is an off-the-shelf assessment. Our aim is to present a challenging case of a patient with a TAAA type IV and a descending aorta aneurysm treated with the sandwich technique and thoracic aneurysm endovascular repair (TEVAR) in two stages.
METHODS: An asymptomatic 72-year old male with a history of previous endovascular aortic aneurysm repair presented to the outpatient department after a 7-year dismissed follow-up. A computed tomography angiography (CTA) revealed a graft migration associated with the development of a TAAA and a second descending aorta aneurysm (TAA). Due to his complex anatomy, a sandwich approach was decided. Two thoracic endografts and 3 stent grafts were used for the sandwich technique. In a second procedure, a thoracic endograft was used.
RESULTS: A thoracic endograft was implanted at the distal descending aorta. Three target vessels (coeliac trunk occlusion was diagnosed preoperatively) were stented with balloon-expandable stents, two of them were catheterized antegradely from the axillary arteries and the right renal artery via the left iliac artery, creating a periscope. A second thoracic graft was implanted down to the bifurcation of the previous endograft. The isolated TAA was decided to be treated in a second stage to avoid spinal cord ischemia. Pre-discharge CTA confirmed no complication. A month later, he was presented to the emergency department due to an atypical thoracic pain. The CTA confirmed the sac expansion of the TAA. An emergent endovascular approach was decided. The pre-discharge CTA revealed no complication. Six-month follow-up revealed no complication.
CONCLUSIONS: Sandwich technique was a safe option for this patient. A two-stage treatment eliminated the risk of spinal cord ischemia. A reintervention in these patients is associated with difficulties in access.

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Endovascular and hybrid aortic surgery in patients with concomitant oncological pathology

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BACKGROUND: In patients with oncological disease aortic comorbidity often becomes a contraindication for specific chemotherapy or surgical treatment. The main objective of our study was to determine the role of endovascular and hybrid aortic procedures in treatment of oncological patients with aortic pathology.
METHODS: 453 endovascular and hybrid procedures for different pathologies of aorta (AAA, TAA etc.) were performed in department of cardiovascular surgery between 2010 and 2018 and in 50 cases concomitant oncological pathology were determined. Operative results of endovascular treatment of aortal pathology were analyzed. Postoperative results and changes in operative tactics in treatment of aortic disease for different localizations of oncological process were analyzed.
RESULTS: Mean age was 76±4,2 years. Male gender was in the vast majority of cases (48 patients). The most frequent oncopathology in analyzed group was carcinoma of prostate (28%). The next most common oncological diseases were lung cancer and colon cancer (16% and 16%). Oncopathologic profile of patients included renal cancer (14%), stomach cancer (12%), bladder cancer (8%), oncohaematological disorders (6%). There weren`t intraoperative and hospital mortality in study group. More than a half of patients (52%) after aortic reconstruction were referred for subsequent curative operation (prostatectomy, gastric resection, gastrectomy, lung resection, hemicolectomy etc.). Renal and colorectal carcinoma patients are of special interest ones. Embolization of renal artery with its covering with stent-graft and preservation of pelvic perfusion (via internal iliac artery) with different technique were performed in these patients.
CONCLUSIONS: Integration of endovascular and hybrid aortic procedures procedure into cancer patient management increases therapy effectiveness and can only feasible treatment option for patient.

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Hybrid treatment of aortic arch disease

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BACKGROUND: Hybrid treatment of aortic pathology does not have any drawbacks of conventional surgical methods. At the same time, it has much wider possibilities of application in comparison with the en-

dovascular method, which has significant anatomical limitations. The abstract presents single center experience in hybrid approach for aortic arch diseases.
METHODS: In years 2014–2018, 65 patients with thoracic aortic pathology underwent hybrid treatment (open surgery on aortic arch branches and TEVAR) in National M. Amosov Institute of Cardiovascular Surgery. 25 patients had descending aortic aneurysm without dissection or rupture; 36 patients had aortic dissection (7 – acute, 4 – subacute, 25 – chronic), two patients had aortic aneurysm rupture and in one case the patient had PAU. Patients scheduled for elective surgery or those not in critical conditions had debranching of aortic arch at the first stage and TEVAR at the second stage. If they had life-threatening conditions (such as aortic rupture, visceral malperfusion), they underwent TEVAR immediately; then after their condition improved, open surgery stage was conducted. In 42 cases, patients had partial debranching, in 15 – subtotal, in 7 - total. Two patients had visceral debranching. We implanted 83 devices in 65 patients. In 7 cases we used scallop stent grafts, in 1 – fenestrated and in 8 - physician modified stent grafts (self-made fenestration) to revascularize aortic branches.
RESULTS: Patients' check-ups took place in three or six months after hybrid treatment. Mortality rate was 3,1%.
CONCLUSIONS: Hybrid approach significantly widens the possibilities of treating aortic pathology in comparison with isolated surgical and endovascular methods.

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Preliminary outcome of Nellix-in-Nellix extensions in patients treated with failed endovascular aneurysm sealing

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BACKGROUND: This study analyzes the clinical outcomes of both elective and emergency deployment of a new Nellix device within a primarily placed device, for failure of EVAS, which we refer to as a Nellix-in-Nellix application (NINA).
METHODS: This is a global, retrospective, observational cohort study focusing on the early outcome of NINA for failed EVAS, including data from 11 European institutions and one New Zealand hospital.
RESULTS: A total of 41 patients were identified who had a NINA procedure. Of these 32 (78%) were placed electively and nine (22%) were placed on an emergency basis. Seven patients were initially treated with chimney-EVAS (n=5 in elective NINA group, n=2 in emergency NINA group). The average time between the primary EVAS procedure and NINA was 573 days (IQR 397-1078 days) and 478 days (IQR 120-806) for the elective and emergency groups, respectively. The indication for elective NINA was endoleak with migration (50%), endoleak without migration (25%), migration without endoleak (16%) and other (9%). Chimney grafts were used in 21/32 patients in the elective group and 3/9 in the emergency group. Technical success was achieved in 94% in the elective group and 100% in the emergency group. At latest follow-up (median 104 days, IQR 49-328) there were three aneurysm-related deaths (9%), no ruptures and five device related reinterventions (16%) within the elective group. In the emergency group (median follow-up of 23 days, IQR 7-61) there were four aneurysm-related deaths and two three aneurysm-related reinterventions.
CONCLUSIONS: In conclusion, a Nellix-in-Nellix application can be used to treat late failures of EVAS with an acceptable technical success rate and can be used when more established treatment options are unfeasible or contraindicated. The durability of this technique needs to be further reviewed.

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Hybrid staged approach preserving orthogradde perfusion in abdominal aortic and hypogastric aneurysms: technical note

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BACKGROUND: Endovascular or open treatment of an abdominal aortic aneurysm (AAA) with bilateral common iliac and hypogastric arteries (HA) aneurysms generally requires HA sacrifice, with a risk of pelvic ischaemia. HA perfusion preservation is increasingly important. In case of HA aneurysms currrent endovascular approaches are off-label with increased reintervention rate and risks of Endoleak (EL) IB, ELII. In case of a total endovascular treatment of such polidistrectual aneurysmatic pathology other risks are colon and spinal cord ischaemia due to lumbar and inferior mesenteric arteries coverage. We describe a two-staged hybrid procedure to preserve HA orthograde perfusion and avoid colon ischaemia.
METHODS: An AAA, right common iliac artery (3,8 cm) and left common iliac artery (7,1 cm) aneurysms, with right and left HA aneurysms were incidentally discovered in a 77-year old male patient.2 days before surgery he underwent left hypogastric aneurysm embolisation and embolisation of minor vessels originating from the right HA aneurysmal sac. The aneurysm was excluded positioning a self-expandable covered stent into the superior gluteal artery. Its proximal landing zone arrived 2 cm proximal to the HA ostium, into the common iliac artery, leaving enough length for surgical anastomosis. A prosthetic aortic-bilateral external iliac artery reconstruction was performed. A bridge Dacron graft sutured to the proximal stent edge was connected to the right prosthetic limb. Inferior mesenteric artery was reimplanted.
RESULTS: Postoperative angiogram demonstrated right superior gluteal artery perfusion, absence of endoleaks from excluded HA aneurysms. No postoperative pelvic ischaemia symptoms were reported.
CONCLUSIONS: Preservation of HA flow is important to prevent ischaemic pelvic complications. This hybrid approach avoids the difficulties related to a surgical deep location of the anastomosis in a totally open approach. It's safe and effective, with no EL IB or II and absence of pelvic complications.

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PETTICOAT in Marfan patient and permanent anticoagulation: immediate results and controversy

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BACKGROUND: Provisional Extension To Induce Complete Attachment (PETTICOAT) technique has shown good results in the treatment of type B aortic dissections. Usually, uncovered bare metal stents are used to promote distal true lumen reattachment.
METHODS: We describe the Petticoat technique using 2 thoracic grafts,

mare metal stent and bifurcation graft in Marfan patient with complex past medical history.
RESULTS: In 2009 mitral valve replacement, in 2015 Bentall procedure and partial debranching performed. In 1 year we did innominate artery bypass stenting because of proximal anastomosis narrowing. In sequel - dissection and aneurysm forming. Patient with severe concomitant pathology, kyphoscoliosis, giant thoracoabdominal dissection with aneurysm forming till femoral arteries. We started with TEVAR till celiac trunk. In control CT - no significant changes in false lumen and aneurysm size. The next steps - full Petticoat on October/2018. We isolated proximal and distal false lumen fenestrations and expect false lumen thrombosis and stop aneurism progression instead of permanent vitamin K antagonist intake. Positive remodeling of the entire aorta occurred in same cases according some papers data: false lumen thrombosis at the thoracic level with true lumen expansion at the visceral aorta at the 18-month CT angiogram.
CONCLUSIONS: Kore information and publications on this issue are required. The usual approach in Marfan patients - open surgery. What should we do in high-risk patients and what is the prognosis of endovascular treatment - are open questions.

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Hybrid surgical treatment of bilateral aorto-femoral occlusion: a clinical case

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BACKGROUND: A 72-year-old man with risk factors for atherosclerosis (smoking, arterial hypertension, hyperlipidemia, burdened heredity) with a severe intermittent claudication.
CASE REPORT: Co-morbidity: atherosclerosis of the brachiocephalic arteries, chronic occlusion of the left internal carotid artery (ischaemic stroke in 03.2017), stable angina (MI in 1997), PTCA with stenting of the right coronary artery in 04.2018.
According to the angiography of the lower extremity arteries, terminal aortic stenosis of 75%, occlusion of the common iliac artery (CIA) from ostium; occlusion of the external iliac artery (EIA), common femoral artery (CFA), superficial femoral artery (SFA), ostial stenosis profund femoral artery (PFA) to the right. Ankle-brachial index 0.49 to the right, to the left – 0.54. On the right endarterectomy from CFA, PFA, xenopericardial patch plasty performed. Retrograde subintimal recanalization of CIA on the left by J-glidewire (0.035") with externalization of the wire into the aortic lumen was performed. Subintimal retrograde recanalization of EIA on the right by J-glidewire (0,035") with the externalization into the lumen of the CIA performed. The first stage was balloon angioplasty with stenting of EIA on the right, followed by balloon angioplasty with CIA stenting on the left. In control angiography — the optimal angiographic result. After surgery ABI 0.71 to the right, to the left — 0.89. The patient was discharged on the 3rd day after surgery. In control: no signs of claudication, CT angiography in a month after surgery — the area of reconstruction without restenosis.
CONCLUSIONS: Hybrid surgical treatment can be successfully performed by experienced specialists in individual patients. Endovascular treatment of such lesions with good outflow appears to be a safe, feasible and minimally invasive method with lower mortality than open surgery, especially in patients at high risk.

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Endovascular approach in terminal aorta occlusion: how and when

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BACKGROUND: to revise indications and analyze results of endovascular treatment in patients with terminal aorta occlusion.
METHODS: 16 endovascular procedures were performed in 15 patients. The mean age of patients was 69 years. Men – 11, women – 4. Risk factors and co-morbidity were identified: smoking, arterial hypertension, stable CAD, hyperlipidemia, obesity, COPD, type 2 diabetes, 2 patients with the neuro-ischemic diabetic foot. Severe lower limbs ischemia was presented in all cases. According to CT-angio infrarenal occlusions of the terminal aorta and iliac arteries were presented. 3-month dual antiplatelet therapy was administrated for all patients.
RESULTS: Bare metal stents were used in all cases. In 10 cases lesion crossing was performed via femoral artery (antegrade and retrograde), in 5 - via brachial artery (antegrade). In 7 of these "rendez-vous" wires technique was used. In all cases the "kissing stent technique" was performed. Residual iliac artery stenosis was 40-50 % in 4 patients due to severe calcinosis. Early left side stent thrombosis was in 1 patient due to undetectable external iliac artery intima dissection. The 30-day mortality rate was 0%. No target lesion revascularization in 6-18 months.
CONCLUSIONS: it is possible to discuss endovascular surgical treatment (bare metal stents) in high-risk patients with aorto-iliac occlusive disease (type D in TASC II) with good results.

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'Soft' hybrid procedures in high risk patients - new view of aortic arch aneurysm treatment

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BACKGROUND: To report the immediate and long-term results of hybrid surgical treatment in patients with aortic arch aneurysm- extraanatomic bypass and TEVAR in Z1-Z2 zones.
METHODS: 23patients with an aortic arch aneurysm were treated. Mean age of patients was 67 years (from 57 to 81). Men 16, women 7. The significant concomitant pathology and risk factors were: arterial hypertension, SCAD, dyslipidemia, COPD. The aortic arch lesions were revealed: saccular aortic arch aneurysm - in 8, fusiform aortic arch aneurism - in 10, saccular aortic arch aneurysm with the first revealed aortic precoarctation - at 1, saccular aortic arch aneurysm with arteria lusoria - in 4. At first one for all patients debranching - extraanatomic bypass - was performed. The second stage was TEVAR.
RESULTS: Technical success was 100%. There were no endoleaks or signs of dissection intraoperatively and according the results of control CT in 9-12 months after the procedure. In the early postoperative period there was no neurological complications, renal failure. In 1 patient after TEVAR with dislocation and overlapping of the left common carotid artery origin, there was a TIA and left upper extremity ischemia, which required the stenting the left common carotid artery origin. The The 30-day mortality rate is 0%.
CONCLUSIONS: The results may indicate that treatment of aortic arch aneurysm with hybrid technologies has potential benefits, such as the absence of a massive operating trauma and blood loss, reduced risk of complications, reduction of the patient's in-hospital stay with good long-term results.

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Carotid surgery in patients with contralateral occlusion: no shunt or endovascular

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BACKGROUND: to evaluate and to compare the results of treatment in patients with contralateral occlusion of internal carotid arteries (ICA) performed in one medical Centre with one vascular and interventional team.
METHODS: A retrospective analysis of 2 groups of patients (N.=35) with atherosclerotic lesion of the ICA and contralateral ICA occlusion performed. The first group (n=15) underwent open surgical intervention – carotid endarterectomy (CEA) (1 group) with high blood pressure, and the second group (n= 20) of patients underwent endovascular treatment (group 2) – carotid artery stenting (CAS). The mean age 59 years. Risk factors was identified: smoking, arterial hypertension, hyperlipidemia, coronary artery disease. Indications to the operation were more than 65 % by duplex ultrasound. There weren't any randomization, only suitable anatomy (previous CT-angio) and co-morbidity. The examination was conducted in the early postoperative period and the long-term period up to 12 months.
RESULTS: In the postoperative period up to 30 days, survival in both groups was 100 %. Restenosis were detected in 1 patients in both groups in the long-term period up to 12 months. Patientin the 1st group had had increased risk of perioperative neurological complications (Stroke + TIA) (OR = 1.21, 95% CI: 0.56-1.94) compared with endovascular. No significant difference in the perioperative mortality rate and the survival rate at 2 years between 2 groups was identified.
CONCLUSIONS: shunt use isn't mandatory in carotid surgery. Presence of risk factors, neurological status, anatomy affect to the choice of tactics of surgical treatment. According the presence of new endovascular approaches CAS is method of choice.

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A patient with Leriche's syndrome underwent coronary artery stent grafting

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BACKGROUND: Leriche syndrome is a rare event,which is potentially causing visseral and lower extremity ischemia. We presented a case with Leriche syndrome.
METHODS: A 60-year old man was hospitalised in our clinic on December, 2017. He underwent PTCA and stent grafting due to left anterior descending and right coronary artery stenosis. He was a smoker. He had severe claudication in the both lower extremity. The digital substraction angiography showed atherosclerotic occlusion of distal abdominal aorta and iliac arteries.
RESULTS: The patient was operated with general anesthesia. Distally, the retroperitoneum was opened over the right side of the aorta to approximately the level of the aortic bifurcation, to allow retroperitoneal tunneling to each groin incision. Retroperitoneal tunnels to each groin incision were then constructed. The patient was systemically heparinised by the anesthesiologist, 5000 units of heparin via intravenous line. The proximal aortic clamp was placed juxta-renal . Proximal end-to-side anastomosis was carried out to abdominal aorta below the proximal clamp and distal end-to-side aorto-right common femoral artery bypass and aorto-left common femoral artery bypass were performed with 16/8 mm Dacron graft. The retroperitoneum was closed. The groin wounds were carefully closed in at least two layers. The distal pulses of both lower extremity were palpable, postoperatively. Pain in the both lower extremity diminished, postoperatively. The patient was discharged after six days with antiplatelet drugs.
CONCLUSIONS: Aorto-bifemoral bypass grafting is safe and effective treatment method in patient with Leriche' syndrome. Endovascular treatment is diffucut and has potentially high complication rate.

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A smoker patient with diabetes, hypertension and hyperlipidemia having severe right carotid artery stenosis

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BACKGROUND: Carotid artery stenosis is an important factor affecting morbidity and mortality.We presented a smoker patient with diabetes, hypertension and hyperlipidemia having severe right carotid artery stenosis underwent left carotid artery stent grafting two months ago,cardiac pace three monts ago, left renal artery stent grafting one year ago and coronary artery bypass grafting two years ago.
METHODS: A 73-year-old man was hospitalized in our clinic in December, 2017.He had ischemic stroke three months ago. He had hypertension, diabetes and hyperlipidemia.The electrocardiography showed pace rhythm. The angiography showed severe right carotid artery stenosis.
RESULTS: Carotid endarterectomy was performed with general anesthesia. Tapes were passed around the common, internal and external carotid arteries . Five thousand units of heparin was administered by anesthesiologist intravenously. The common, internal and external carotid arteries were clamped. An arteriotomy was made on the anterior wall of the right common and internal carotid arteries extending to the region not including plaque. Carotid endarterectomy was performed. The arteriotomy was closured by a continuous running stitch, using No.6 polypropylene suture material. The closure of incision was carried out in layers in the usual fashion. The patient was discharged with clopidogrel and aspirin on third postoperative day.
CONCLUSIONS: Carotid endarterectomy is effectiveand safe method in patients with co-morbidity having severe carotid artery stenosis. Careful and appropriate dissection of carotid artery is important to decrease morbidity.

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Outcome of fenestrated endovascular aneurysm repair in octogenarians; a retrospective multicentre analysis

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BACKGROUND: The aging population leads to more age related diseases, such as complex abdominal aortic aneurysms (AAA). Patients with complex AAAs and multiple comorbidities benefit from fenestrated endovascular aneurysm repair (FEVAR), but this benefit is not completely clear for the elderly.

METHODS: Between 2001 and 2016 all patients treated for complex AAA with FEVAR in two tertiary referral centres were screened for inclusion. Group one consisted of patients of 80 years and older and group two of patients younger than 80 years. The groups were compared for procedural, postoperative and follow-up outcome. Outcome was compared for patient- and reintervention-free survival, and target vessel patency.
RESULTS: Group one consisted of 42 patients (mean age 82.3 years) and group two of 230 patients (mean age 71.4 years). No differences were seen in pre-operative patients' comorbidities, except for age and renal function. Renal function was 61.4 ml/min/1.73m2 versus 74.3 ml/min/1.73m2 (p <0.001). No differences were seen between procedures, except for a slightly longer operation time in group two. Median follow-up after 30-days was 18 and 31 months. No difference was seen between groups for estimated cumulative overall survival (P=0.078) at 1-, 3- and 5-years, being 95%, 58% and 42%, and 88%, 75% and 62%, respectively. There was no difference seen between groups for the estimated cumulative reintervention-free survival (P=0.900) at 1-, 3- and 5-years, being 82%, 82% and 82% in group one, respectively and 87%, 83% and 83% in group two, respectively. Ultimately, no difference was seen between groups for the estimated cumulative target vessel patency (P=0.574) at 1-, 3- and 5-years, being 100%, 100% and 90%, and 96%, 93% and 92%, respectively.
CONCLUSIONS: Age itself is not a reason to withhold FEVAR in the elderly and choice of treatment should be weighed by the patient's comorbidities and preferences

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Features of metabolic divisions in women with peripheral arterial disease

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BACKGROUND: To determine the features of metabolic disorders in women with peripheral arterial disease (PAD). METHODS: 331 patients with atherosclerotic lesions of lower limb arteries were examined. Patients were divided into 2 groups according to gender: 135 patients constituted the main group, 196 male patients were included in the control group. All patients conducted a study of the severity of carbohydrate and lipid disorders, hemodynamic parameters, analyzed the features of the course of PAD and comorbid conditions. The diagnosis of metabolic syndrome was established in accordance with the criteria of ATP III. In the postoperative period, the dynamics of tissue oxygenation, measured at the level of the foot by means of percutaneous oximetry, the development of complications, the presence of lethal outcomes up to 30 days after surgery, was taken into account.
RESULTS: PAD manifestation in women was observed at a later age compared with men (P<0.05). Diabetes mellitus was more often noted among patients of the main group, including the decompensated variant (P<0.05). The glucose level and glycated hemoglobin among patients with diabetes mellitus was higher in women (;P=0.001). The level of total cholesterol and atherogenic coefficient was also higher in women (6.25±2.89 v/s 5.17±1.27 mmol/l and 5.85±1.42 v/s 4.88±2.21;P<0.05). Obesity was more often recorded in women with PAD (P<0.05). A tendency to an increase in the incidence rate of previous adverse cardiovascular events as well as cardiac arrhythmias and angina, in male patients suffering from peripheral atherosclerosis (P<0.05) was revealed. feet were more pronounced in male patients (P<0.05). "Large" postoperative complications were more common in women (P<0.05).
CONCLUSIONS: females are characterized by more pronounced changes in metabolism, which affects the characteristics of atherosclerotic lesions of lower limb arteries. Timely correction of the above disorders can help improve the outcome of revascularization in PAD patients.

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The effect of gender on carotid endarterectomy outcomes

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BACKGROUND: The aim of the study was to study the gender characteristics of atherosclerotic lesions of the brachiocephalic arteries and outcomes of carotid endarterectomy.
METHODS: The course of atherosclerotic lesions of the carotid arteries was studied in 88 patients. The patients were divided into 2 groups by gender: 21 female patients were included in the main group, 67 male patients made up the control group. All patients were studied metabolic status: carried out the assessment of carbohydrate and lipid metabolism. To clarify the hemodynamic features, all patients underwent perioperative blood pressure monitoring. The results of the elimination of carotid stenosis in the early (30 days) and late (up to 5 years) periods are analyzed.
RESULTS: Atherosclerotic carotid stenosis in women debuted at a later age (P<0.05). The course of the atherosclerotic process in women was characterized by more pronounced metabolic changes and hemodynamic perioperative instability. In particular, diabetes mellitus was more common in females (P<0.05). The level of total cholesterol and atherogenic coefficient was higher in women (P<0.05). More pronounced fluctuations in systolic blood pressure were more characteristic for women (P<0.0001). Complications were more common in females on the first day after surgery: women complained of headaches and dizziness more often (P<0.001), atrial fibrillation was detected in 2 patients (P<0.05). Transient ischemic attacks within a month after surgery were recorded in 1 man and 1 woman (P=0.38). An acute violation of cerebral circulation in the early periods was detected in 1 female patient (P=0.2).
CONCLUSIONS: Patients with atherosclerotic lesions of the carotid arteries are characterized by more pronounced metabolic disorders, which affects the peculiarities of the course of the underlying disease and the results of carotid endarterectomy.

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Streptococcus pneumoniae as a cause of mycotic and infected aneurysms in patients without respiratory features

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BACKGROUND: Streptococcus pneumoniae is considered a rare cause of mycotic aneurysms. The microbiological diagnosis of mycotic aneurysms can be difficult and many patients have negative blood culture results.
METHODS: We describe a series of four consecutive cases of mycotic aneurysms caused by S. pneumoniae with no respiratory features or extravascular septic foci. In two patients with negative blood culture

results 16S PCR was used for the diagnosis of S. pneumoniae infection.
RESULTS: Four men with mycotic aneurysms affecting the aorta, axillary and popliteal arteries caused by S. pneumoniae presented to our centre between 2015 and 2016. All were treated with at least one month of intravenous antibiotics, followed by at least 4 weeks of oral antibiotics. Two were additionally managed using endovascular surgical techniques, and one underwent an open surgical repair. The fourth patient presented with bilateral popliteal aneurysms, one of which ruptured and was managed using surgical ligation and bypass while the other side subsequently ruptured and was repaired endovascularly. Three of the four patients are currently off antibiotics and considered cured, while one died of an unrelated cause.
CONCLUSIONS: Pneumoniae should be considered a potential causative agent of mycotic aneurysms. Diagnosis can be confirmed using 16S PCR, especially in patients where peripheral blood cultures are uninformative.

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Endovascular embolization and exclusion of a true axillary artery aneurysm in a renal transplant patient

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BACKGROUND: Arterial dilatation after longstanding arteriovenous fistula (AVF) is a common finding as the artery adapts to the increased flow rate. Aneurysmal degeneration of the donor brachial arteries with the development of true aneurysms is rare. This is not prevented by closure or thrombosis of the arteriovenous access and may be associated with a history of renal transplantation and immunosuppressive treatment.
METHODS: We describe a case of a 25-year-old male presenting with a painful, pulsatile mass on his right arm. He had an occluded AVF on his right elbow joint and previous surgery for aneurysmal degeneration of the right brachial artery. The first surgical intervention was performed in Oct 2016 with a 6mm PTFEe conduit after aneurysmectomy. The second one was a right subclavian-ulnar autologous saphenous vein bypass (Feb 2018). He received a kidney transplant in 2017 since then he has been administrated with immunosuppressive drugs and corticosteroids. In September 2018 the patient was admitted to our department complaining of pain and paresthesia in the right upper limb. An ultrasound duplex scan revealed a great true aneurysm of the right axillary artery. An angio-CT scan confirmed the aneurysm with parietal thrombosis, distal occlusion of the brachial artery and the patency of two side branch arteries feeding the aneurysmal sac previously excluded by surgical ligation.
RESULTS: The patient underwent endovascular treatment under local anesthesia. A selective coils embolization of the right subscapular and posterior circumflex humeral arteries was performed. At 4-month follow-up the patient did not present neurologic or ischemic symptoms and duplex scan showed the complete aneurysmal sac thrombosis.
CONCLUSIONS: The pathogenesis underlying donor artery aneurysmal degeneration remains unclear. Surgical treatment is a safe and effective option. Endovascular treatment can be a valid treatment option in selected cases and when previous surgical procedures make a further "redo-surgery" uncomfortable.

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Biopsy of temporary artery: relevance in the diagnosis of giant cell arteritis

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BACKGROUND: Temporal or giant cell arteritis is the most common form of systemic vasculitis. Early diagnosis and aggressive treatment are essential to avoid acute ischemic optic neuritis.
METHODS: Retrospective study with patients undergoing temporal artery biopsy in our center from 2010 to 2018. Demographic and comorbidities data were collected, as well as the signs and symptoms suggestive of temporal arteritis. The diagnosis of giant cell arteritis was considered as a score greater than or equal to 3 according to the criteria of the American College of Rheumatoloy (ACR-SCORE).
RESULTS: Fifteen patients were included, with an average age and follow-up of 74.97±6.56 and 3.15±2.86 years, 73.3% (n=11) of whom were women. The most frequent symptoms were amaurosis fugax (n=6, 40%), temporo-parietal headache (n=7, 46.7%) and generalized arthralgias (n=8, 53.3%). The preoperative echodoppler was performed in 73.33% (n=11) of the cases, being positive only in 3 (27.27%). The preoperative erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were 63.93±28.64mm/h and 50.48±47.99 mg/dl, respectively. The median preoperative ACR-SCORE was 2 [1-4]. After performing a temporary biopsy, it was observed that patients with a positive biopsy had a significantly higher CRP (89.63±40.34 versus 24.38±33.14, P=0.004) and a VSG with a tendency to superiority (79.67±23.48 versus 53.44±27.95, P=0.081). Likewise, the median postoperative ACR-SCORE was significantly higher in the positive cases (4 [2-5] versus 2 [1-3], P=0.005). A cut-off point greater than or equal to 72mm / h and 32.4mg / dl for ESR and PCR, respectively, was estimated using a COR curve. Observing a positive predictive value of 83.3% for the VSG and 75% for the PCR.
CONCLUSIONS: CRP and ESR are predictors of giant cell arteritis in patients with high suspicion of vasculitis. In patients with an ACR-SCORE less than 3, the temporal artery biopsy contributes to the diagnosis of temporal arteritis.

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Impact of the nutritional and inflammatory status on patients with critical ischemia of lower limbs

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BACKGROUND: Despite significant advances in the treatment of peripheral arterial disease, critical ischemia of the lower extremities (LES) maintains a high morbidity and mortality. The multiple risk factors for malnutrition and the pro-inflammatory state of this population lead to a worse prognosis.
METHODS: We included patients with critical ischemia of EEII, revascularized in our center in 2018, with at least one determination of albumin prior to the intervention. Albumin and inflammatory status prior to surgery (neutrophil/lymphocyte ratio [NLR], platelets/lymphocytes [PLR], lymphocytes/monocytes [MRL] and the Prognostic Nutritional Index [PNI]) have been recorded. Mortality, hospital stay and need for major amputation were also studied.
RESULTS: Of the 186 operated patients, 125 met the inclusion criteria. The mean age was 71.2 years (41-93) and the mean follow-up was 5.5 ± 4.4 months. It was observed that a PNI and low MRLs (36.39±6.31

vs 31.66±6.13, P=0.011, 46±1.74 vs 2.46±1.02, P=0.046, respectively) and a high NRL (3.49±2.08 vs 8.18±5.41, P=0.009) were associated with a higher mortality during the medium-term follow-up. The increase in neutrophils and monocytes (5869.63±2730.17 vs 7481.53±3501.53, P=0.012, vs 592.19±237.23 vs 713.33±180.86, P=0.029, respectively) together with a lower PNI (36.62±6.34 vs 31.94±5.37, P=0.002) were associated with a need for major amputation. A lower PNI and a higher NLR and PLR were associated with longer hospital stays (P=0.002, P=0.013 and P=0.018, respectively).
CONCLUSIONS: A worse nutritional state and a higher inflammatory state prior to surgery are correlated with a higher mortality, a greater need for major amputation and a longer hospital stay during the medium term follow-up.

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Negative pressure wound therapy in groin incision management

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BACKGROUND: Post-operative wound complications such as surgical site infections (SSI) and surgical wound dehiscence are a key concern . Such complications are associated with excess morbidity for the patient and increased treatment costs arising from excess hospital stays. Surgical site infections in vascular surgery are, relatively, more common in other surgical specialties.
METHODS: Data were extracted retrospectively from patient notes on patients consecutively treated for groin desobstruction between January 2013 and July 2018. The single-use NPWT system was introduced into practice from August 2016. Prior patients were treated with standard post-operative dressings. 99 patient records were identified from notes.
RESULTS: A cohort of 88 patients were eligible for analysis, 63 patients treated with standard care and 25 treated with the single-use NPWT device. There was no significant differences were observed in thecofounding factors of the two patient groups.The introduction of sNPWT lowered primary length of stay, readmitted length of stay and visits to outpatient appointments following discharge. The average cost per patient in the standard care group was €3,150 compared to €2,562 in the sNPWT group. This shows a reduction of €588 per patient. The data show a bed occupancy of 7.73 days in the standard care group and 6.11 in the sNPWT group. If we were to consider the implications of treating a cohort of 100 patients, bed days saved would be 162 days.
CONCLUSIONS: PICO was shown to provide both clinical and economic benefits over standard care in the treatment of groin desobstruction patients. Overall complication rates reduced significantly. The results demonstrated a release in both financial costs and service capacity.

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Popliteal vein aneurysm - rare source of pulmonary embolisation

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BACKGROUND: One of the less common sources of recurrent pulmonary embolisation is thrombosis in popliteal vein aneurysm. Venous aneurysms are generally rare and often diagnosed incidentally.
METHODS: Authors present three cases of young ladies with recurrent pulmonary embolisation where the source was thrombosed popliteal vein aneurysm. Diagnostic methods and therapeutic options are discussed.
RESULTS: All three cases were solved surgically with aneurysm resection or aneurysmoraphy. Therapeutic outcomes were optimal in all cases.
CONCLUSIONS: The aim of our presentation is to highlight less common cause of pulmonary embolisation and to discusse indication to surgical solution.

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Giant femoropopliteal arterial aneurysms in patient with klippel trenaunay syndrome: case report

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BACKGROUND: Klippel Trénaunay syndrome (KTS) is a rare disease characterized by soft tissue and bone hypertrophy, malformation as arteriovenous fistula and angiodysplasia in the venous system. We present a rare case of giant femoropopliteal arterial aneurysms treated with a composite bypass: dacron graft and autologous varicous saphenous vein treated with aneurismorraphy and coating with vycril mesh
METHODS: A 56 years old man came to our attention for ulcers , multiple femoropopliteal arterial aneurysms and varicosities in his right hypertrophic lower limb. He has a diagnosis of KTS and in other hospital he performed multiple embolizations of arteriovenous fistulas. AngioCT scan showed a common femoral arterial aneurysm with 40 mm diameter, multiple superficial femoral and popliteal arterial aneurysms with 40-50 mm diameter. Considering the anatomy and localization of the aneurysm it was decided for surgical repair. The patient underwent external iliac artery - profunda femoral artery bypass with dacron prosthesis associated with femoropopliteal bypass with reversal autologous saphenous vein. It was decided to use the autologous saphenous vein also it was a varicous vein so was necessary to do multiple aneurismorraphy and coating with vycril mesh.
RESULTS: The graft is patent without dilatation , ulcers are healed. No aneurysm is detected in any arteries by angio CT scan and duplex scanning.
CONCLUSIONS: This report describes a rare case of femoropopliteal arterial aneurysms associated with KTS. Surgical treatment with autologous saphenous vein was recognized as the best surgical choice. The aneurysmorraphy and coating with vycril mesh is a good solution for the utilization of varicous vein.

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Adventitial cystic disease of the radial artery

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BACKGROUND: Adventitial cystic disease of the radial artery is a rare pathology.
METHODS: This is one case report about adventitial cystic disease of the radial artery.
RESULTS: A 36 years old caucasian man complained of pulsatile mass at the left wrist. He was carpenter and had no past history. Computed tomography showed 8 millimeter adventitial cyst of the radial artery. Because the patient was invalidated, surgery was realized. Under general anesthesia, resection of the cyst with radial artery preservation was

performed. There was no complication. After one year follow-up, the patient is asymptomatic.
CONCLUSIONS: Adventitial cystic disease of the radial artery can be an occupational illness. If the patient is invalidated, it can be surgically treated.

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The results of carotid endarterectomy: the comparative study of diverse techniques

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BACKGROUND: The eversion carotid endarterectomy (CEA) is one of the fist-line procedures for atherosclerotic carotid stenosis. However, procedure-related haemodynamic changes and its following complications may prolong hospitalization and increase procedure-related morbidity and mortality. The typical, widely used, technique (T-CEA) requires to separate and invite destruction of carotid glomus. We are using the glomus-sparing technique (GS-CEA) because we surmise such would prevent procedure-related haemodynamic changes. The aim of this study was to investigate the influence of the different eversion techniques in basic perioperative results and the incidence of postoperative complications.
METHODS: Over a six-years period, 332 CEAs (253 T-CEAs, and 79 GS-CEAs) were performed on 317 patients. The choice of CEA-technique was not randomized. All of procedures were performed under general anesthesia with systemic heparinization. The majority of patients in both groups be treated with antiplatelet drug continuously. Perioperative course, blood pressure deviation, antihypertensive drug demand and the incidence of postoperative complications, as well as re-stenosis rate were evaluated.
RESULTS: No significant differences in the number ischemic complications (1.6 % vs. 0%; 0.059), the restenosis rate (3.2% vs. 2.1%; 0.110), but a difference in favour for T-CEA-group in the length of the surgery (58.2±15.6 minutes vs. 67.4±13.0 minutes; 0.022) and in the time of clamping (11.4±5.2 minutes vs. 19.5±7.1 minutes; 0.007) were revealed. At the same time, the other criteria disclosed the advantages of thereof in the prevention of postop hypertension (P=0.002) and as a natural result, in the amount of postop drainage (78.4±32.5 ml vs. 51.2±19.8 ml; 0.019), local hemorrhage (0.004), incl. re-op (0.007) and re-intubation (0.001) cases . Eventually, the total number of postop complications was significantly less in the GS-CEA (0.020).
CONCLUSIONS: The results of this study suggest that glomus-sparing eversion endarterectomy may be worthy alternative to typical procedure for prevention of postoperative complication.

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Adjunctive prosthetic wrapping of vascular anastomoses following surgical repair of Behcet's aortoiliac aneurysms

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BACKGROUND: This study was conducted to evaluate our local experiences for the prosthetic wrapping at the outer surface of the aortoiliac anastomoses in patients with Behçet's aortic/aortoiliac aneurysms. The goal of this wrapping is to reinforce the anastomoses in order to prevent pseudoaneurysm formation. This was aided by the administration of pre- and postoperative immunosuppressive therapy and an adjunctive treatment.
METHODS: Between 2007 and 2013, sixteen patients with Behçet's disease, who underwent open surgical repair of abdominal aortic aneurysms (AAA) with/without iliac aneurysms, were reviewed retrospectively. Data for all patients were retrieved and analyzed for diagnostic procedures, surgical techniques, and graft selection. We also analyzed the patients' survival functions and graft-related complications such as occlusion, thrombosis, and anastomotic pseudoaneurysms. The consequence of complications following surgery was analyzed using the Kaplan-Meier survival method.
RESULTS: We recruited 16 patients, 12 males and 4 females (ratio 3:1), with a mean age of 34±7.7 (range 23-45 years). All Behçet's aortic/aortoiliac aneurysms were repaired by the application of heparin-bonded Dacron® grafts. The wrapping technique was performed for both the proximal and the distal vascular anastomoses in all patients. All patients were given pre- and postoperative systemic immunosuppressive therapy. There were no graft-related complications except for only one patient who developed anastomotic pseudoaneurysm at one of the left iliac anastomoses.
CONCLUSIONS: Prosthetic wrapping for vascular anastomoses in patients with Behçet's aortic/aortoiliac aneurysms is a feasible, simple, and reliable technique with low morbidity and mortality. It was performed as a prophylactic measure to avoid the development of the postoperative pseudoaneurysms, which is considered as one of the commonest and fatal complications in such patients. Moreover, the administration of adjunctive pre- and postoperative systemic immunosuppressive therapy should be considered as an important factor for the prophylaxis and prevention of the development of anastomotic pseudoaneurysms and other graft-related complications.

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The spontaneous ruptures of a non-aneurysmal abdominal aorta

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BACKGROUND: Anecdotal evidence suggests that spontaneous ruptures of non-aneurysmal, non-infected abdominal aorta are extremely rare events. Certainly, the amount of them is incomparably smaller than amount of ruptured abdominal aortic aneurysms. However, each such case becomes cumbersome for emergency management. In this study we analyzed our experience in diagnosis and treatment of such conditions that we term an "acute abdominal aortic syndrome" among ourselves due to likeliness of the same radiologic, clinical and morphologic findings in thoracic aorta.
METHODS: During last fifteen years we observed 46 patients (median age 61 years, 31 women) with nonaneurysmal rupture of abdominal aorta. In all of the cases, patients had the clinical signs of internal bleeding, so suspected aneurysmal rupture was as a main version on admisson. The diagnosis was determined by ultrasound and CTA. The

radiologic findings included typical signs of para-aortic and retroperitoneal hemorrhage without evidence of aortic dilatation.
RESULTS: 44 patients underwent emergency aortic repair (35 open and 9 endovascular procedures), two persons died before surgery. The biopsy was made on each open procedure, and on autopsy by two after EVAR died patients. In most of the cases (81.6%), the penetrating aortic ulcer as a result of aggressive atherosclerotic lesions was revealed. In other seven cases, the disruption of aortic wall had come out from aseptic inflammation in aortic wall. Overall, the atherosclerotic lasion was recognized as a cause of rupture in 76.1%, but in three cases the nature of rupture continues to remain an enigma. The common postoperative lethality amounted 19.6%. Moreover, three patients died on the table due to suture failure along the entire length of aorta.
CONCLUSIONS: Our modest experience indicates that non-aneurysmal rupture of abdominal aorta is quite rare but not casuistic aortic emergency condition. So, it should be suspected in each case of non-traumatic retroperitoneal bleeding.

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Long-term results of ruptured abdominal aortic aneurysm repair in elderly patients

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BACKGROUND: Immediately repair is the only potentially life-saving procedure for patients with ruptured abdominal aortic aneurysms (RAAA). Otherwise, the advanced age is an independent and significant predictor of poor outcome, especially for emergency repair. It is thought that such major procedure, even successful, doesn't increase a life time in elderly persons, but impairs the life quality and is unreasonably cost-intensive. This circumstance can restrict not only referral for surgery from general physicians, but also a decision of open repair by vascular surgeons in absence of capability for emergency EVAR. The aim of this study was the analysis of long-term results of open repair in elderly patients.
METHODS: During fifteen years 103 patients aged 76 and older underwent open repair of RAAA in our center. 58 of them survived 30 days after surgery minimally and were discharged. All of them were included in this analysis, 16 octogenarians and 4 nonagenarians at the time of baseline included. The duration of long-term follow-up amounted to 151 months.
RESULTS: A median survival after the baseline as a main criterion was evaluated. The common median for all included patients amounted to 74 months. The longest survival life (88 months) time was for persons up to age 79 inclusive. The median survivals for octogenarians and nonagenarians were 29 and 14 months respectively. Cardiovascular events were the main cause of death. In addition, the assessment of health-related quality of life (HRQoL) indicators through the use of SF-36 was performed for definition of social value of life time increase. The results of assessment demonstrated to 'non-repaired' population comparable results for Physical Health (PH) and exceeding results for Mental Health (MH).
CONCLUSIONS: The results of this study provide sufficient grounds to believe that open repair of RAAA can be allowable choice in selected cases even for elderly patients.

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The results of carotid endarterectomy: the comparative study of diverse techniques

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BACKGROUND: The eversion carotid endarterectomy (CEA) is one of the fist-line procedures for atherosclerotic carotid stenosis. However, procedure-related haemodynamic changes and its following complications may prolong hospitalization and increase procedure-related morbidity and mortality. The typical, widely used, technique (T-CEA) requires to separate and invite destruction of carotid glomus. We are using the glomus-sparing technique (GS-CEA) because we surmise such would prevent procedure-related haemodynamic changes. The aim of this study was to investigate the influence of the different eversion techniques in basic perioperative results and the incidence of postoperative complications.
METHODS: Over a six-years period, 332 CEAs (253 T-CEAs, and 79 GS-CEAs) were performed on 317 patients. The choice of CEA-technique was not randomized. All of procedures were performed under general anesthesia with systemic heparinization. The majority of patients in both groups be treated with antiplatelet drug continuously. Perioperative course, blood pressure deviation, antihypertensive drug demand and the incidence of postoperative complications, as well as re-stenosis rate were evaluated.
RESULTS: No significant differences in the number ischemic complications (1.6 % vs. 0%; 0.059), the restenosis rate (3.2% vs. 2.1%; 0.110), but a difference in favour for T-CEA-group in the length of the surgery (58.2±15.6 minutes vs. 67.4±13.0 minutes; 0.022) and in the time of clamping (11.4±5.2 minutes vs. 19.5±7.1 minutes; 0.007) were revealed. At the same time, the other criteria disclosed the advantages of thereof in the prevention of postop hypertension (P=0.002) and as a natural result, in the amount of postop drainage (78.4±32.5 ml vs. 51.2±19.8 ml; 0.019), local hemorrhage (0.004), incl. re-op (0.007) and re-intubation (0.001) cases . Eventually, the total number of postop complications was significantly less in the GS-CEA (0.020).
CONCLUSIONS: The results of this study suggest that glomus-sparing eversion endarterectomy may be worthy alternative to typical procedure for prevention of postoperative complication

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Which one first? TEVAR or mitral valve replacement

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BACKGROUND: Biomechanical studies of aortic aneurysms have highlighted the role of aneurysm geometry in rupture risk.Regardless of size or symptomatic status, repair of saccular aortic aneurysms is frequently recommended based on a perceived predisposition to rupture. However mitral valve regurgitation can be included in elective surgical planning under appropriate medical treatment.
METHODS: Here, we presented our surgical plan in a patient with thoracic aortic saccular aneurysm and severe mitral regurgitation.

RESULTS: A 76-year-old male patient with diabetes mellitus, COPD and hypertension was admitted to the emergency department with dyspnea and peripheral edema.CT angiography showed a saccular aneurysm in thoracic aorta that from origin of the left subclavian artery and continued along at approximately 3 cm segment.Also echocardiography showed a chordae rupture of anterior mitral leaflet(A2) compatible with severe mitral regurgitation.Following the necessary preparations, the patient was operated due to firstly saccular aneurysm.Medtronic captiva 44x44x-100mm and 32x32x100mm endovascular thoracic aortic graft were placed through the left femoral artery and the origin of the left subclavian artery was closed.Cause of no contrast filling in the left subclavian artery on control angiography, we performed peripheral bypass from the right subclavian to the left subclavian artery with a 8mm PTFE graft.One week after the operation, the patient was prepared for mitral insufficiency operation.Preoperatively, coronary angiography was performed and coronary artery lesion was detected.The patient was operated for MVR and CABG. Firstly coronary bypass was performed and then mitral valve was replaced with a mechanical mitral valve number 29.After the operation, the patient was taken to intensive care unit and discharged with cure.
CONCLUSIONS: Due to the risk of rupture saccular aortic aneurysms require intervention primarily, especially in cases requiring cardiopulmonary bypass under heparin.We see that the correct surgical strategy is life-saving in patients planned for multiple cardiovascular surgery.

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The incidence of thoracoabdominal arterial dissection based on CTs

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BACKGROUND: Thoracoabdominal arterial dissections have been found more frequently with the more frequent use of CTs. But the incidence of dissections, especially in abdominal splanchnic artery was not well known. The estimation of thoracic aortic dissection is about 3-4 cases per 100,000 persons per year. According to our previous report, the estimation of incidence was 1.99. We would like to know the incidence of thoracoabdominal aorta and abdominal splanchnic arterial dissections in thoracic and abdominal CTs.
METHODS: To know the incidence of thoracoabdominal aorta and abdominal splanchnic arterial dissections, I reviewed radiologic reports of thoracic and abdominal CTs for 14 years between Jan-01-2005 and Dec-31-2018 in Chungbuk National Univerity Hospital. If I found words like "dissection" or "hematoma" or "plaque" in radiologic reports of 107175 patients(abdominal CTs:79782, thoracic CTs:57051), I reviewed the CT images to know characteristics of arterial dissections.
RESULTS: We found abdominal splanchnic arterial dissections in 134 patients and the incidence was 0.168%. The dissection in the superior mesenteric artery is the most common among abdominal splanchnic arteries. The celiac and renal arteries are in decreasing order. We found abdominal aortoiliac arterial dissections in 59 patients and the incidence was 0.073%. The involved range of dissections is usually focal and the symptomatic dissection is very rare. We found thoracic aortic dissections in 189 patients and the incidence was 0.331%. The Standford type A dissection is 40% and B is 60%. The incidence of DeBakey type I dissection (19.6%) is quite similar to the incidence of type II dissection (20%).
CONCLUSIONS: The total incidence of dissection is 0.356%. The incidence of abdominal splanchnic arterial dissections is half of the thoracic aortic dissections. The superior mesenteric artery is the most frequent artery of dissection among abdominal splanchnic arteries. The DeBakey type III dissections are the most frequent in the thoracic aorta.

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Relative change in temperature and atmospheric pressure are mechanistic factors in acute aortic syndrome occurrence

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BACKGROUND: Acute aortic syndromes (AAS) have been related to circadian and seasonal conditions. Characterizing and understanding these variations is essential to ensure an optimal management of medical resources and treatment strategy during vulnerable periods. We used time series analyses to precisely assess the impact of meteorological disturbances on AAS occurrence, while accounting for possible confounding factors.
CASE REPORT: We retrospectively evaluated 160 patients presenting consecutively with AAS (type A or B acute aortic dissection, ruptured aortic aneurysm) over a 10-year period in a French hospital. Average daily temperature (T) and atmospheric pressures (AP) at the location of the event were collected, and their association with AAS investigated with generalized additive models. Decrease in temperature (between 5 and 10°C) within the previous 7 days was associated with an increased risk of AAS when the initial temperature at day-7 was comprised between 4 and 25°C (average OR = 1.50 [1.07; 2.10]), whereas an increase in temperature was associated with a reduced risk of AAS (average OR = 0.65 [0.46; 0.93]). On the contrary, when the initial temperature at day-7 was below 4°C, an increase (between 5 and 10°C) within the seven previous days was associated with an increased risk of AAS (significant ORs for combinations of high increases and low initial temperature values). Regarding AP, a decrease (between 2 and 4hPa) within the previous three days was associated with an increased risk of AAS (average OR = 1.76 [1.05; 2.98]) while an increase (between 2 and 4hPa) within the previous 3 days was associated with a decreased risk of AAS (average OR = 0.57 [0.35; 0.94]). More than the absolute temperature or atmospheric pressure on the day of occurrence, the relative change in temperature and atmospheric pressure according to the initial value during the previous days may be one of the trigger mechanism for AAS.

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Minimal invasive IV aortic surgery

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BACKGROUND: Minimal inavasive apporaches have been practiced in single valve surgery with adquate outcome and comparabule results to convential apporaches with superior results near zero wound infection. Aortic surgery is demanding surgery , and performing through minimal invasive approach make it demanding and unique entity.
METHODS: 11 patients have been operated in KAMC, Makkah from June 2011 to December 2018. Data of patients and operative technique are reported.
RESULTS:
M/F 13/4
AGE 56 +/-9
CREATININ 0.8 +/+ 0.3
Pathology aortic aneurysm ascending 7, sinus valsalva aneurysm 3, aortic hematoma ascending 1, mean bypass time 147+/_32 min, ischaemic

time 113+/_8 min, postoperative complications, stroke 1, bleeding 850 ml+/_300 ml
icu stay 2.3+/_ 1 day, hospital stay 9 +/- 2 days, no death cases reported, zero infection of enteral or peripheral cannulation site.
CONCLUSIONS: Minimal invasive approach are safe and comparable to convential median sternotomy in term of morbidity and mortality.

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Acute limb ischemia caused by the emboli from occluded femoro-femoral bypass graft

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BACKGROUND: This report describes a patient with previously thrombosed grafts who subsequently presented with limb-threatening ischemia owing to peripheral embolization from the graft.
METHODS: A 41-year-old man presented to the emergency room (ER) with sudden onset of right calf pain. A CT angiography demonstrated a total occlusion of tibioperoneal trunk. His history included aortic dissection with Stanford type B, diagnosed at three years earlier and femoro-femoral bypass was performed due to acute right limb ischemia. One years earlier, the femoro-femoral bypass graft was occluded, but he showed no symptoms. He visited to ER at one month earlier with right calf pain and managed with conservatively. At that time, his ABI was 1.01/0.99. After admission, emergent embolectomy was performed. The patient's symptom was resolved and his arterial pulse below the knee was detected postoperatively. Two days later, no arterial pulse was detected below the knee, once again. We reviewed CT angiography and concluded the occluded femoro-femoral bypass graft can be a source of peripheral emboli, resulting in recurred right limb ischemia.
RESULTS: The patients was operated on for disconnection of the thrombosed graft from the native circulation and embolectomy was performed repetitively. He has been free of recurrent symptoms during two years follow-up period.
CONCLUSIONS: Operative disconnection from the native circulation is proposed if the embolism occurs from the occluded graft and no other embolic origin can be detected. Due to the unusual phenomenon and its associated morbidity, awareness of this condition are imperative.

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Treatment with drug-eluting-balloon for subclavian steal syndrome and vertebral artery involvement

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BACKGROUND: The first line approach of subclavian steal syndrome is PTA-stenting of subclavian artery. When the omolateral vertebral artery origin is involved or in close proximity of the atherosclerotic lesion in the subclavian artery PTA-stenting is not indicated due to the risk of vertebral artery coverage. In these circumstances the open surgical treatment is indicated. Herein we report our experience with DEB to address lesion involving the subclavian artery and the origin of the omolateral vertebral artery.
METHODS: A retrospective analysis of patients presenting subclavian steal syndrome addressed with endovascular procedures was conducted. Were included patients presenting subclavian artery lesion involving the origin of the omolateral vertebral artery and treated using primary DEB. Were identified two patients suffering from left subclavian steal syndrome. Both cases were treated using a percutaneous transfemoral approaches and positioning an embolic protection device in correspondence of the vertebral artery.
RESULTS: Technical success was met in both cases and the angioplasty using DEB did not required additional stenting. At procedure completion both patients recovered from the preoperative clinical condition. No complication, symptoms recurrence, restenosis or occlusion were reported in duplex ultrasound scan during 12-month follow-up.
CONCLUSIONS: In our limited experience, the use of DEB in association to embolic protection device in the treatment of atherosclerotic subclavian lesion involving the origin of the vertebral artery was safe and technically feasible. In our experience the use of DEB was a valuable tool in patients with complex subclavian lesions unfit for conventional surgery when standard PTA stenting was not indicated.

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Combined TAVI and EVAR in increased surgical risk patients

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BACKGROUND: The prevalence of combined severe aortic stenosis and abdominal aortic aneurysm is increasing with the ageing of the population. Both conditions are associated with adverse outcome if not adequately managed. The choice of the optimal treatment of these patients is challenging and no clear recommendations are available.
METHODS: We report three cases of patients with concomitant severe symptomatic aortic stenosis and infrarenal abdominal aortic aneurysm successfully treated with combined transfemoral transcatheter aortic valve implantation (TAVI) and endovascular aortic aneurysm repair (EVAR).
RESULTS: The technical success was 100%. No major complications occurred in the perioperative period. In the average follow-up of 18 months (range 12-24) we observed a death due to intestinal obstruction.
CONCLUSIONS:The reported cases demonstrate the versatility of transcatheter techniques and suggest that, in carefully selected patients, the combined procedure of TAVI plus EVAR, if performed by multidisciplinary expert operators, is safe and effective.

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Endovascular treatment of residual iliac artery aneurysm after abdominal aortic aneurysm repair with bifurcated graft

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BACKGROUND: Aneurysm of the residual stump of the common iliac artery (CIA) after aortobifemoral bypass surgery is an uncommon finding. Surgical treatment of the iliac artery aneurysm developing after abdominal aortic aneurysm (AAA) repair is technically demanding because

of postoperative adhesions and the position of the aneurysm deep in the pelvis. In the present case, endovascular treatment using coil was selected to exclude the aneurysm.
METHODS: A 65-year-old man presented with symptomatic left aneurysm of residual CIA stumps. He had received a bifurcated graft interposition for a ruptured AAA in March 2013. During the follow-up period, left residual CIA aneurysm was progressively dilated up to 34mm in March 2018. Angiographic procedures were performed in the operation room under general anesthesia with C-arm.
RESULTS: After insertion of a 6-Fr. introducer sheath via the ipsilateral superficial femoral artery, coil (Interlock, Boston scientific) embolization of left internal iliac artery and CIA aneurysm was performed successfully. Follow-up CT scan demonstrated thrombosis and shrinkage of the residual CIA aneurysm.
CONCLUSIONS: Coil embolization is a safe and effective alternative to open surgery in patient with CIA aneurysm that develop after AAA repair with a bifurcated graft.

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The experience of two vascular centers in the use of supera stent for femoropopliteal lesions

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BACKGROUND: Endovascular interventions are increasing in the treatment of long femoro-popliteal lesions. Standard laser-cut nitinol stents offer an acceptable midterm patency rate but still controversial in the long-term period, particularly in the setting of complex lesions. The Supera interwoven nitinol stent is designed to have superior radial strength and fractures resistance.
METHODS: From January 2016 to July 2018, 32 patients (19 M / 13 F) with femoro-popliteal occlusion were treated at two italian vascular surgery centers. The majority of patients (24/32) were affected by critical limb ischemia (class IV-VI Rutherford).
RESULTS: Thirty-eight Supera stents were successfully deployed. The mean length of the femoro-popliteal lesions was 102 ± 25 mm. The primary latency at 30 days was 100% without any stent fracture. During a mean follow-up of 19 months, two patients experienced an intrastent restenosis treated with a drug eluting balloon. In four cases occurred an occlusion of the stent: only two patients were successfully treated with intra-arterial trombolysis. The primary patency rate was 83% at nineteen months. One major amputation was necessary thus determining an overall limb salvage rate of 97%.
CONCLUSIONS: The use by vascular surgeons of this relatively new device is feasible in the treatment of long femoro-popliteal lesions. Our results in this small population of diseased patients not suitable for surgery are promising.

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A rare case of 7 simultaneous arterial dissections

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BACKGROUND: Spontaneous multiple artery dissections is a relatively rare phenomenon. Early clinical signs are often nonspecific, making it difficult to diagnose.
CASE REPORT: This is a case of a 51-year-old female who presented with spontaneous dissection of four visceral arteries with ruptured splenic artery pseudoaneurysm, dissections of both iliac arteries, and of the right internal carotid artery. The patient underwent urgent successful endovascular repair. Later complications included ARDS and pneumonia after massive blood transfusion. She recovered gradually and was discharged after 21 days. A genetic investigation was performed in search of connective tissue disorder. Results revealed a new COL3A1 subtype mutation. Results revealed a new COL3A1 subtype mutation. The pathogenicity of this variant remains unclear. Follow-up CTA scans at 3 and 6 months demonstrated patent stents and stable dissection with no other pseudoaneurysms.
CONCLUSIONS: We recommend a high index of suspicion for visceral artery dissection in the differential diagnosis for abdominal pain with concurrent uncontrolled hypertension. Early diagnosis and intervention are crucial to reduce mortality rate.

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Pediatric and adolescent extremity vascular injuries in the limited-resource settings: a retrospective study

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BACKGROUND: Vascular injuries to the extremities although being uncommon among the pediatric population they may result in serious life-threatening disabilities. This study was conducted to evaluate our local experience for the management of pediatric and adolescent extremity vascular trauma in poor/limited resource settings.
METHODS: A retrospective study was within a period of 11 years from 2006 to 2016, at Tertiary Referral University Hospitals having an emergency and specialized trauma centers. All types of arterial repair were performed by highly experienced vascular and endovascular surgeons and well trained general and pediatric surgeons. Patients were divided into three age groups. Group I (5-10 years), group II (11-15 years), and group III (16-21 years).
RESULTS: We recruited 183 patients with Lower extremity injuries. Arteriorrhaphy was performed in 32%, primary repair and natural grafting in 40.5%, and 49%, respectively. While 10.5% underwent surgical bypass. There is a significant correlation between Mangled Extremity Severity Score and age groups I and II ($P<0.001$). Different treatment modalities of arterial repair were having the same survival rate ($P<0.001$). The definitive limb salvage and arterial patency were accomplished in approximately 94% ($P<0.001$).
CONCLUSIONS: It is highly recommended to using autologous vein graft as a primary treatment option, rather than synthetic materials for repair of vascular injuries. Moreover, other treatment modalities such as; arteriorrhaphy and repair with end-to-end primary vascular anastomosis must be adopted, whenever possible, especially in the limited-resource settings as it is reliable, feasible, with fewer postoperative complications.

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Surgical treatment of carotid chemodectomy

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BACKGROUND: The purpose of the study is to show the benefits of surgical interventions in the treatment of carotid chemodectoma of neck.
METHODS: During 1963-2019, 51 patients (35 women and 16 men) were operated upon for carotid chemodectoma. The epidemiological features, nature of carotid arteries lesions, diagnostic methods, treatment and complications of this disease were analyzed. Two patients had bilateral lesions. The diagnosis was confirmed on basis of anamnesis, physical examination, imaging techniques (ultrasound, computed tomography, angiography and magnetic resonance imaging). All patients were subjected to different types of surgical interventions.
RESULTS: No postoperative deaths were registered. Paresis and paralysis of cranial nerves were observed in 52% patients, which were corrected by 1–2 months of conservative treatment. Histological examination confirmed the diagnosis of carotid chemodectoma in all 51 cases. Among benign types, alveolar variant was more prevalent- 26 (51%) cases, angioma-like variants and adenoma-like variants were less prevalent – 9 (17.6%) and 6 (11.7%) cases respectively. Malignancy was found in 12 (23.5%) cases. There was no relapse of the disease during the follow-up period up to 15 years.
CONCLUSIONS: Surgical treatment in patients with carotid chemodectoma must be active, regardless of the duration of disease, tumor size or signs of malignancy. Thus, surgical interventions on carotid artery to treat carotid chemodectoma helps to avoid disorders of cerebral circulation, ischemic cerebral strokes, disability and related deaths.

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The vascular graft infections

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BACKGROUND: To demonstrate the successful conservative treatment of patients with thoracic and thoraco-abdominal aorta graft infection (GI).
MATERIALS: During 2004-2019, after 912 operations for aortic aneurysms, GI was observed in 8 (0.8%) patients. Operations were performed on three patients for dissecting aneurysms, four for aneurysm thoracoabdominal aorta, one for mycotic aneurysm. GI in 7 (87.5%) patients originated within 8-15 days, 1 (12.5%) 3 months after operation. Wound suppuration was observed in 6 (75%) patients, pneumonia in 4 (50%) infected hem-thorax in 7 (87.5%) patients. St. aureus was observed in 3 patients, St. epidermidis in 2 and E. coli and Ps. aeruginosa in one case in the pleural cavity. The blood cultures Ps. aeruginosa was found in one patient, St. aureus in two cases, the association Ps. aeruginosa + St. aureus in one patient. Four patients underwent scintigraphy with labeled leukocytes, 6 PCT. CT in 6 patients. Patients underwent re-operation with cleaning of grafts and peri-graft space with antiseptics (Octenisept, iodine), thoracotomy with constant introduction of antimicrobial drugs. Was done double, triple antibiotic therapy. In 5 cases were used sodium hypochlorite and ozone therapy for 8-10 days.
RESULTS: 7 out of 8 patients (87.5%) recovered. One patient died 3 months after surgery due to sepsis. Another patient died within 2 years from MI.
CONCLUSIONS:Thus, early diagnosis of graft infections and timely treatment eliminates the unnecessary removal of grafts in most patients.

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The results of aorto-aortic bypass operations with antimicrobial vascular prostheses “BASEX”

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BACKGROUND: To demonstrate the successful treatment of infections to descending thoracic aorta grafts.
METHODS: During 2004-2019. 12 patients were operated with infections to the descending thoracic aorta graft after istmoplasty (5 patients), lined grafting (6 patients) and endo-grafting (1 patient).
In all patients, surgery was performed in two stages. In the first stage, surgery was done using auxiliary cardiopulmonary bypass, through right sided thoracotomy was performed aorto-aortic bypass from the ascending to the descending thoracic aorta using the “BASEX” patches. After closing the thoracotomy on the right side, the patient is turned to the right side and the left thoracotomy was performed. Resection of false aneurysm, infected graft was removed, most of the aneurysm wall was excised and the para-aortic abscess cavity cleaned using potent bactericidal agents (Octenisept, formic acid, chlorhexidine, iodine). The aorta is then sutured by double-row suture as a prophylaxis for proximal and distal aneurysm. During the postoperative period was performed detoxification, antibacterial and immune-correction therapy.
RESULTS: The mortality rate was 2 (16.7%) patients: first patient died due to sepsis during the postoperative period, in the other case the death was due to acute heart failure. The remaining patients (83.3%) were discharged from the hospital in satisfactory condition. In the long term there was no evidence of reinfection of the grafts.
CONCLUSIONS: Thus, the aorto-aortic bypass using the antimicrobial vascular graft “BASEX” significantly improves the results of operations following the infections of the descending thoracic aorta graft.

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The diagnosis of early infection in vascular surgeries

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BACKGROUND: To study the use of scintigraphy with labeled leukocytes (SLL) and procalcitonin test (PCT) for diagnosis of infections in vascular surgery.
METHODS: SLL and PCT were performed on 92 patients with wound infections following surgery on aorta and arteries. Patients with wound infections were divided into 2 groups. The first group consisted of 47 patients with superficial suppurating wounds, second group consisted of 45 patients with deep suppurating wounds. For comparative evaluation were examined the count of white blood cells, leukocyte intoxication index (LII), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR).
RESULTS: In all patients, the plasma level of PCT before surgery was <0.5 ng / ml, in first group patients were observed moderately elevated or normal PCT. Severe hypercalcitonimea was detected in second group patients. After re-surgery for treatment of high levels of PCT, within 24-72 hours PCT values decreased to normal. Improvement of the patients’ condition was always preceded by a decrease in the concentration of PCT. The use of PCT in predicting the development of the infectious process was superior. SLL of 15 patients revealed local infection within projections of graft. However, increased accumulation of labeled leuko-

cytes in these areas was less than 10-15%. Patients underwent antibiotic therapy and all recovered.
CONCLUSIONS: Thus, SLL and PCT are more informative methods in the early diagnosis of infectious complications in vascular surgery.

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The modern methods of diagnosis and treatment symptomatic arterial hypertension

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BACKGROUND: To diagnose secondary or symptomatic arterial hypertension (SHT) in patients with primary or essential hypertension (EHT).
METHODS: During 1986-2018 were examined 2284 patients aged 5-75 years with a diagnosis of EHT. With comprehensive examinations in 71.0% patients, EHT could not be confirmed.
RESULTS: During comprehensive examinations, nephrogenic (parenchymal) hypertension (chronic pyelonephritis, nephrolithiasis, hypernephroma etc.) was diagnosed in 42.0%, coarctation of the aorta in 2.5%, Reno vascular hypertension in 5.3%, aneurysm in 9.7%, non-specific aortoarteritis and congenital hypoplasia in 1.0% patients. Endocrine hypertension was diagnosed in 15.8% patients of which adrenal pheochromocytoma was the cause of hypertension in 1.8%, primary hyperaldosteronism (Conn's syndrome) in 9.8%,Cushing's syndrome in 0.8%, lesions of cerebral arteries in 1.8% patients. Medicinal hypertension was the cause of hypertension in 0,8%, alcoholic hypertension in 0.3%, cocaine hypertension in 0.3% and use of oral contraceptives in 0.5% patients.
CONCLUSIONS: Thus with comprehensive examinations (ultrasound, CT, MRI) of patients with EHT, the cause of hypertension could be confirmed in 70% patients. The widespread use of highly informative diagnostic techniques can significantly reduce the proportion of EAH. Upto 80% of small-sized tumors could not be detected by traditional methods. Surgical interventions in 80-85% patients helped minimize dosage of antihypertensive drugs, reduce cerebral and cardiac complications, improved quality of life. Lifetime antihypertensive therapy in SHT is indicated only to patients who are contraindicated to surgical, endovascular, endoscopic corrections or in its ineffectiveness.

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A case of a high-risk patient treated by a modified Candy-Plug technique in emergency setting

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BACKGROUND: Candy-Plug is a challenging technique reserved to high-risk patients. This technique makes it possible the exclusion of a patent FL with a treatment limited to the thoracic aorta. We report a technique feasible with materials commonly available also in emergency setting.
METHODS: A 79 year-old lady, treated in 2011 for acute type B aortic dissection at another institution by thoracic aortic endovascular repair (TEVAR), was admitted to the emergency room of our hospital for hemoptysis. As risk factors, she had arterial hypertension, chronic kidney disease, diabetes mellitus and chronic obstructive pulmonary disease.
The preoperative computed-tomography-angiography (CTA) showed false lumen (FL) distal extension and increased FL diameter (46mm). The right renal artery (RRA) branched from the FL. The patient was treated by a modified Candy-Plug technique in order to occlude the FL, using a back-table-modified 28x100x28mm thoracic stentgraft (TAG, WL Gore, Phoenix, AZ, USA) and a 18x14mm Amplatzer Vascular Plug II (AVP II), implantation of a 14x10mm AVP II and 2 pushable coils in order to occlude the left subclavian artery and RRA fenestration/stenting with a 6x39mm covered stent.
RESULTS: The post-operative course was uneventful and the patient was discharged four days after surgery. The follow-up control showed successful exclusion and shrinkage of the false lumen.
CONCLUSIONS: Candy-Plug Technique is a valuable tool for the treatment of secondarily complicated chronic aortic dissections, being feasible in a variety of settings and patients.

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Venous arterialization in a patient without any other possibility for limb salvage

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BACKGROUND: We describe the case of an 83 years old man affected by Rutherford 6 critical limb ischaemia with the following comorbidities: hypertension, diabetes mellitus and dyslipidaemia. The patient was already submitted to a popliteal-posterior tibial artery bypass graft with Great Saphenous Vein (GSV) of the right lower limb in another hospital. Due to a poor run off, he did not have wound healing and ischaemic pain resolution. For this reason, the patient presented to our Emergency Room. We performed a new surgical approach by the arterialization of the deep venous system creating a distal arteriovenous fistula with the GSV graft.
METHODS: The patient was first submitted to duplex ultrasound and then to a digital subtraction angiography (DSA). The DSA showed patency of the bypass graft previously done but a poor run off resulting in the typical "desert foot". We performed the intervention under regional anaesthesia. Prophylactic antibiotics and perioperative heparin were administrated. Only autologous venous material was used (GSV). We created a jump between the bypass graft already existing and the deep paramalleolar vein using the GSV without performing the destruction of the tibial vein valves. After the completion of distal anastomosis, continuous thrill was palpable on the vein graft and on the distal tibial vein below the intermalleolar line. A week later, we performed a metatarsal amputation with the partial surgical closure of the wound.
RESULTS: A post-operative DSA showed patency of the bypass and of the distal anastomosis with enhancement of leg and plantar veins, plantar venous arch and metatarsal veins in the foot. The duplex ultrasound showed graft patency at 6 months after the discharge. Complete wound healing was achieved with resolution of rest pain.
CONCLUSIONS: Extreme surgery with deep venous arterialization is an option that promotes the healing of ischemic ulcers and successful limb salvage.

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Coil retrieval using endobronchial forceps during a bronchial artery embolization

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BACKGROUND: We describe a case of a 62yrs old woman who complained haemoptysis. Computed Tomography Angiography showed

the presence of a hypertrophied tortuous left bronchial artery, ectopically arising from descending thoracic aorta at D8 level. The patient had no relevant comorbidities. We planned a Bronchial Artery Embolization (BAE).
METHODS: The intervention was performed under local anaesthesia. A 5F sheath was inserted into the right femoral artery and a catheter was advanced in the descending aorta. We identified and catheterized the hypertrophied bronchial artery. A coil was delivered but, due to high flow conditions and the vessel tortuosity, it migrated to the left femoral artery bifurcation. Angiography demonstrated no evidence of thrombosis or vascular injures. We retrieved the coil using an endovascular approach. After the change of the 5F with a 7F long sheath, its extremity was advanced up to the left femoral bifurcation. The endobronchial forceps were inserted through the 7F sheath, they grasped the coil and they were removed with it. Then we performed the BAE correctly.
RESULTS: Thirty days postoperative CT Angiography demonstrated correct position of the coil and the complete occlusion of the hypertrophied bronchial artery. We performed a duplex ultrasound that showed patency of the left femoral bifurcation and no evidence of vascular injures. The patients referred the absence of other haemoptysis events.
CONCLUSIONS: The use of endobronchial forceps is safe and it guarantees the complete retrieve of the dislocated coil without injures or damages to the vessels.

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Arterial hypertension and to adrenal pheochromocytoma

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BACKGROUND: To identify pheochromocytoma of adrenal glands in patients with essential hypertension.
METHODS: From 1986 to 2019, 2285 patients with arterial hypertension were examined of which adrenal pheochromocytoma was the cause of hypertension in 1.8% patients. Extraadrenal forms of pheochromocytoma of heart, para-aortic space with a malignant course of hypertension was diagnosed in 3.0% patients.
RESULTS: In 97.9% patients, there was a good and satisfactory hypotensive effect post-surgery. One patient had a relapse after 5 years. After radical surgery was normalized. Another patient with pheochromocytoma with a large heart was inoperable. Malignant pheochromocytoma with distant metastasis was diagnosed in 4 patients only with CT and MRI. Unfortunately, due to late diagnostic methods only metastases of the malignant growth could be determined. Small sized pheochromocytoma could not be diagnosed by ultrasound, angiography, the same was diagnosed in 32% patients exclusively using MRI and CT. 10 patients were identified extra adrenal single or multiple pheochromocytoma of diameter 1 to 4mm in para-aortic tissue around the renal arteries that were not diagnosed by ultrasound and preoperative examination of hormones. After surgical intervention in patients with unilateral lesions of adrenal glands, 97.9% patients showed good hypotensive effects. Prolonged hypotensive effect has been observed in patients in whom tumor removal was performed with splanchnicganglionectomy, extended sympathectomy.
CONCLUSIONS: Thus, the widespread use of CT, MRI allows the diagnosis of pheochromocytoma in a timely manner and significantly reduces its complications.

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Arterial hypertension and Conn's syndrome

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BACKGROUND: To identify primary hyperaldosteronism (Conn's syndrome) in patients with essential hypertension (EHT)
METHODS: From 1986 to 2019, 2285 patients aged 5 to 75 years with diagnosis arterial hypertension were examined, in 71.0% patients the diagnosis EAH could not be confirmed and was identified as various forms of secondary hypertension.
RESULTS: With comprehensive examinations Conn's syndrome (primary hyperaldosteronism) with adrenal adenoma was diagnosed in 9.8% of patients. Small adenoma and macro- and micro nodular adrenal hyperplasia could not be diagnosed using the traditional ultrasound, angiography, so MRI and CT were used to diagnose them in 32.2% of patients.
During revision of retroperitoneal cavity in 22 patients was observed macro- or micro nodular adrenal hyperplasia. In 10 patients, small formations of diameter 1 to 4 mm were not diagnosed by ultrasound and hormone study before surgery. After the surgical interventions, good hypotensive effects were observed in 98% patients with unilateral lesions of adrenal glands and normotensive effects were observed in 65% patients with bilateral lesions of adrenal glands. Prolonged hypotensive effects were observed in patients who underwent removal of the tumor of adrenal glands by epi- subphrenic splanchnicganglionectomy, extended sympathectomy. The surgical corrections of adrenal hypertension in 65- 85% of patients showed good and satisfactory effects.
CONCLUSIONS: Thus, the widespread use of informative diagnostic methods (CT, MRI with contrast) helps in an early diagnosis and significantly reduces the complications.

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The masks of renovascular hypertension in patients with essential hypertension

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BACKGROUND: To identify the frequency of renal arteries lesions, renal hypertension (RHT) in patients with essential hypertension (EHT)
METHODS: From 1986-2019, were examined 2285 patients of age 5-84 years with persistent hypertension, who were treated in hospitals and leading clinics in Moscow with a diagnosis of "Essential hypertension"
RESULTS: Hemodynamic hypertension was diagnosed in 9.7% patients. RHT was detected in 5.5% patients. In 20 patients due to occlusion of the renal artery and long-term hypertension, had renal scarring and reduced renal morphometric indicators, they underwent nephrectomy epi- sub phrenic splanchnicganglionectomy. Renal artery stenosis was detected in 54 patients. The blood pressure normalized in 92% patients who had a 5-year history of EHT, following renal artery angioplasty. The blood pressure normalized in only 65% patients who had a 10-year history of EHT due to irreversible changes in the kidneys. Dissecting aortic aneurysm with the discharge of one of the renal

arteries was detected in 0.8% patients. Only 40% patients were fit for surgical interventions and they underwent successful reconstruction of aorta and arteries with satisfactory antihypertensive effects.
CONCLUSIONS: The use of highly informative diagnostic methods (CT, MRI) contributed to reduction of serious complications in patients with EHT and improved the results of treatment. Late surgical interventions were ineffective in 25- 35% patients with RHT. Timely restoration of circulation in 85-95% of cases lead to normalization of blood pressure.

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The aortic lesions in patients with essential hypertension

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BACKGROUND: To reveal coarctation of the aorta, coarctation syndrome (congenital hypoplastic, stenotic nonspecific aortoarteritis, thoraco-abdominal aortic dissecting aneurysm of the aorta) in patients with essential hypertension (EHT).
METHODS: From 1986-2019 were examined 2285 patients of age group 5-84 years with persistant hypertension, who were treated in hospitals and leading clinics in Moscow for essential hypertension (EHT).
RESULTS: Coarctation of the aorta was detected in 2.5% patients. In 53.3% patients aged 20-60 years coarctation of the aorta complicated aneurysm of the thoracic aorta due to prolonged hypertension, which was not diagnosed for many years. Correction of coarctation and aortic aneurysm led to normotension only in 4 (25%) patients. Coarctation syndrome with aortic stenosis and its branches due to nonspecific aortoarteritis and congenital hypoplasia was detected in 1.0% patients with a 10-year history of hypertension. All patients underwent surgical interventions. Elimination of coarctation syndrome brought about normotension in only 55% patients. Dissecting aortic aneurysm was detected in 0.8% patients. Only 45% patients were fit for surgical interventions and they underwent successful reconstruction of aorta and arteries with satisfactory antihypertensive effects.
CONCLUSIONS: The volume of medical care to patients with hypertension in the Russia is unsatisfactory frequency of EHT is much less (29%), in contrast to that mentioned in the literature (70-80%). During an extensive survey, it was observed that 71% of specialized clinics in Moscow managed to find out the exact cause of hypertension and put a correct diagnosis.

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Arterial hypertension in patients with renal parenchymal lesions

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BACKGROUND: To identify the hypertension (RHT) with renal parenchymal lesions in patients with essential hypertension.
METHODS: From 1986-2019, were examined 2285 patients aged 5-84 years with persistent hypertension and diagnosis essential hypertension.
RESULTS: Following comprehensive examinations, RHT was diagnosed in 42.0% patients. After surgery, 87% patients showed good and satisfactory effects. Nephrectomy, decapsulation of the kidneys, splanchnicganglionectomy(SGE) of 62% patients led to normotension, 25% patients showed significant reduction in blood pressure, reduction in doses of antihypertensive drugs. In 13% patients the operation led to a decrease in blood pressure by 15-20 mm Hg. Renal cysts were found in 3.0%, polycystic in 0.7% patients. Removal of cysts, omental revascularization, expanded SGE in 65% of patients have led to a decrease in blood pressure. In 88% patients expanded SGE, kidney decapsulation with satisfactory effects were performed. Nephrolithiasis with chronic pyelonephritis was diagnosed in 4.2% patients, nephroptosis in 2.0% patients. Nephropexy, renal artery angioplasty, SGE led to normotension in 91.7% patients. In 2 patients due to the pronounced hypertensive nephrosclerosis, surgery did not lead to normotension. Ormond's disease (retroperitoneal fibrosis) with compression of the ureter was the cause of hypertension in 0.3% patients. Hypernephroma with hypertension was diagnosed in 0.3% patients and after surgery blood pressure returned to normal in all patients.
CONCLUSIONS: Thus, diagnosis EHT should be considered only after excluding other forms of hypertension. Surgical interventions must be indicated following ineffective conservative treatment for patients with persistent RHT.

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