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UNILATERAL VERSUS BILATERAL ANTEGRADE CEREBRAL PERFUSION IN AORTIC ARCH SURGERIES: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS AND PROPENSITY-MATCHED STUDIES

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Background-Aims: Selective antegrade cerebral perfusion (SACP), delivered via unilateral (uACP) or bilateral (bACP) approaches, is widely used in aortic arch surgery to protect the brain during circulatory arrest. Previous meta-analyses, primarily based on unmatched observational data, have found no significant differences between these techniques, but the quality of evidence has remained a limitation. Our meta-analysis is the first to exclusively incorporate high-quality data from randomised controlled trials (RCTs) and propensity-matched studies to provide a more definitive comparison.

Methods: A systematic review of MEDLINE, Scopus, and Cochrane databases was conducted up to November 2024 to identify RCTs and propensity-matched studies comparing uACP and bACP. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using RevMan 8.13.0 to evaluate key perioperative outcomes, including neurological complications, mortality, and organ dysfunction.

Results: We included 8 studies comprising 2,072 patients, with 1,025 (49.5%) patients in the uACP group. The pooled analysis revealed that uACP was associated with a shorter hospital length of stay [MD -2.2 days; 95% CI -3.6 to -0.7; $p<0.05$] and a reduced incidence of permanent neurological dysfunction (PND) [OR 0.7; 95% CI 0.5 to 0.9; $p<0.05$]. However, uACP was linked to a higher incidence of acute kidney injury (AKI) [OR 1.5; 95% CI 1.1 to 2.0; $p<0.05$]. No statistically significant differences were observed between uACP and bACP in terms of aortic cross clamp time, cardiopulmonary bypass duration, ventilation time, transient neurological deficits, ICU length of stay, 30-day mortality, and re-exploration for bleeding.

Conclusion: While previous meta-analyses based on unmatched retrospective data have reported comparable outcomes between uACP and bACP, our meta-analysis provides new insights by identifying significant differences. uACP was associated with shorter hospital stays and lower PND incidence, but at the expense of a higher AKI risk. These findings underscore the importance of individualised patient selection and tailored perfusion strateies in aortic arch surgery.

ROBOTIC-ASSISTED VERSUS CONVENTIONAL MEDIAN STERNOTOMY FOR THE SURGICAL EXCISION OF CARDIAC MYXOMAS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background-Aim: Cardiac myxoma constitutes the most prevalent primary heart tumour, often necessitating surgical resection to prevent complications. While median sternotomy is the standard approach, it is associated with significant morbidity. Robotic-assisted myxoma excision (RA-ME) has emerged as a minimally invasive alternative, but comparative data on their outcomes remains limited. Our meta-analysis aimed to compare postoperative outcomes of RA-ME versus conventional median sternotomy myxoma excision (MS-ME).

Methods: We systematically searched MEDLINE, Scopus, and Cochrane Library, focusing on studies that compared RA-ME and MS-ME. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using RevMan 8.13.0.

Results: Seven studies comprising 447 patients, with 180 (40.3%) undergoing RA-ME, were included. RA-ME was associated with significantly longer cardiopulmonary bypass times [MD 23.0 minutes; 95% CI 11.1 to 35.00; $p<0.05$] and aortic cross-clamp times [MD 11.4 minutes; 95% CI 4.6 to 18.2; $p<0.05$]. However, it demonstrated reduced hospital stay [MD -2.00 days; 95% CI -2.6 to -1.4; $p<0.05$], ICU stay [MD -0.3 days; 95% CI -0.5 to -0.01; $p<0.05$], blood loss [MD -115.2 mL; 95% CI -230.4 to -0.02; $p<0.05$], and blood transfusion requirements [OR 0.4; 95% CI 0.2 to 0.8; $p<0.05$]. Other outcomes, including mechnical ventilation time, surgical re-exploration, arrhythmias, pneumonia, and surgical wound infections, were comparable.

Conclusions: RA-ME demonstrated several advantages over MS-ME, including reduced hospital and intensive care unit stay, as well as decreased blood loss and blood transfusion requirements, despite longer cardiopulmonary bypass durations. These findings support RA-ME as a safe alternative to MS-ME.

CORONARY ARTERY BYPASS GRAFTING VERSUS PERCUTANEOUS CORONARY INTERVENTION IN HEART FAILURE WITH REDUCED EJECTION FRACTION PATIENTS: A META-ANALYSIS STRATIFIED BY LEFT VENTRICULAR EJECTION FRACTION

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Background: Debate exists in the literature when comparing coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI) in coronary artery disease (CAD) patients with heart failure with reduced ejection fraction (HFrEF). Therefore, it is paramount to understand the impact of reduced left ventricular ejection fraction (LVEF), to its varying extents, on clinical outcomes following CABG or PCI. This leads to a risk-stratified model for selecting more suitable patients for each procedure based on individual demographics to optimize results. This meta-analysis aims to compare CABG and PCI in HFrEF patients regarding mortality and long-term survival, repeat revascularization, new postoperative myocardial infarction (MI) and stroke, stratified by the degree of LVEF reduction.

Methods: A systematic literature search was conducted across PubMed, MEDLINE, Scopus, and EMBASE databases, adhering to PRISMA guidelines. Twenty studies comprising 25,031 patients (CABG: 12,957, PCI: 12,074) met the set inclusion/exclusion criteria. Meta-analysis of extracted data was conducted using the R-studio and STATA software. Hazard ratios (HRs) with 95% confidence intervals (CIs) were pooled using a random-effects model. Furthermore, the aforementioned study endpoints were stratified by the degree of LVEF reduction into severe (<35%), moderate (<40%) and mild (<50%).

Results: Among patients with severe LVEF reduction (<35%), CABG was associated with significantly higher long-term survival (HR 0.63, 95% CI 0.51-0.76, p<0.01), reduced need for repeat revascularization (HR 0.27, 95% CI 0.19-0.39, p<0.01), and lower MI risk (HR 0.42, 95% CI 0.29-0.59, p<0.01), with no significant difference in stroke incidence (HR 1.13, 95% CI 0.84-1.51, p=0.43). In the moderate LVEF group (<40%), survival was similar between CABG and PCI (HR 1.07, 95% CI 0.86-1.34, p=0.53), though CABG significantly reduced re-

vascularization rates (HR 0.34, 95% CI 0.22-0.52, p<0.01). In patients with mild LVEF reduction (<50%), CABG demonstrated superior long-term survival (HR 0.61, 95% CI 0.51-0.74, p<0.01), lower repeat revascularization (HR 0.31, 95% CI 0.18-0.54, p<0.01), and decreased MI risk (HR 0.44, 95% CI 0.20-0.97, p=0.04), with stroke rates remaining comparable (HR 1.29, 95% CI 0.74-2.26, p=0.37). No evidence of significant heterogeneity or publication bias was found.

Conclusions: CABG offers superior long-term results compared to PCI in HFrEF patients, particularly in those with severe and mild LVEF reduction. These findings highlight the importance of individualized risk stratification based on LVEF to optimize revascularization strategies, improve patient selection, and enhance clinical outcomes.

EN BLOC VERSUS BRANCHED GRAFT TECHNIQUE FOR SUPRA-AORTIC VESSEL REIMPLANTATION IN TOTAL ARCH REPLACEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background-Aim: Total arch replacement (TAR) necessitates the reimplantation of supra-aortic vessels to maintain cerebral and upper body perfusion. This can be achieved using either the en bloc (EB) or branched graft (BG) technique; however, their comparative superiority remains a subject of debate. Our meta-analysis aims to evaluate and compare the perioperative outcomes associated with these approaches.

Methods: A systematic literature search was conducted across the MEDLINE, Cochrane, and Scopus databases to identify studies comparing EB and BG techniques in TAR. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using RevMan 8.13.0.

Results: Six observational studies comprising 2,028 patients were included in the final analysis, with 50.2% undergoing supra-aortic vessel reimplantation via the EB approach. The pooled analysis demonstrated a statistically significant reduction in aortic cross-clamp (ACC) time in favour of the EB technique [MD -13.2 min; 95% CI -22.7 to -3.7; $p < 0.05$]. Additionally, a borderline reduction in permanent neurological deficits (PND) was observed with EB technique [OR 0.74; 95% CI 0.5 to 1.0; $p = 0.09$]. Intraoperative and 30-day mortality, as well as other postoperative complications, including transient neurological deficits, acute kidney injury, myocardial infarction, reoperation for bleeding, and aortic reintervention, were comparable between the two approaches.

Conclusion: Our findings suggest that the EB technique facilitates a faster reimplantation process with a significantly shorter ACC time, while demonstrating comparable safety profiles to the BG reimplantation. Given the absence of significant differences in major postoperative outcomes, an individualised approach should be adopted when selecting the optimal technique for TAR.

PREDICTORS AND PROGNOSIS OF MILD REGURGITATION AFTER RHEUMATIC MITRAL VALVE REPAIR: A DUAL-CENTER COHORT ANALYSIS BASED ON CARDIAC COMPUTER TOMOGRAPHY

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Background-Aim: Rheumatic mitral disease (RMD) remains a significant health issue, especially in developing regions. Although mitral valve (MV) repair improves outcomes, residual mild mitral regurgitation (MR) is common. This study aims to identify clinical and anatomical factors associated with residual mild MR after MV repair and to assess its impact on MR progression and survival.

Methods: A dual-center, retrospective cohort study of 580 RMD patients who underwent MV repair successfully at two high-volume centers in China. Patients were classified into no MR (n=371) and residual mild MR (n=209) based on postoperative echocardiography. Cardiac CT assessed MV anatomy and calcification. Logistic regression identified factors associated with residual mild MR. Long-term follow-up analyzed MR progression and survival, with propensity score matching to adjust for confounders.

Results: The mean age was 57.6±7.5 years, 73.8% female. Residual mild MR was associated with higher rates of calcification (56.0% vs. 43.9%, p=0.007) and subvalvular fusion (27.3% vs. 19.7%, p=0.045). Atrial fibrillation, systolic pulmonary artery pressure, calcification volume, and papillary muscle or chordae tendineae fusion were independent risk factors. After 8 years, the residual mild MR group had lower freedom from progression to moderate/severe MR (53.0% vs. 74.4%, p=0.005), but no difference in survival (97.6% vs. 97.1%, p=0.75).

Conclusions: Residual mild MR after MV repair is associated with an increased risk of MR progression but does not impact long-term survival. Preoperative cardiac CT provides valuable guidance by identifying high-risk factors, which can help optimize patient selection and improve long-term outcomes.

MYOCARDIAL PROTECTION STRATEGIES IN EMERGENCY CORONARY ARTERY BYPASS GRAFTING: BLOOD VS. CRYSTALLOID CARDIOPLEGIA

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Background: On-pump coronary artery bypass grafting (CABG) with cardioplegic arrest remains a crucial treatment strategy for patients with acute coronary syndromes (ACS). However, the optimal choice between blood and crystalloid cardioplegia for myocardial protection during emergency CABG is still debated. This study investigates the impact of different cardioplegic solutions on ACS patients undergoing emergency CABG using data from the North-Rhine-Westphalia Surgical Myocardial Infarction Registry.

Methods: A multicenter, large-scale surgical myocardial infarction registry analysis was conducted on 2912 ACS patients undergoing isolated CABG between 01/2010 and 03/2023. Primary study endpoint was defined as in-hospital mortality (IHM), while secondary endpoints included cardiac-related death (CD) and major adverse cardiac and cerebrovascular events (MACCE). Statistical analyses included univariate and multivariate logistic regression models, along with advanced non-parametric multivariate methods to evaluate independent predictors of clinical outcomes.

Results: Patients were 67.6±11 years (mean±SD) of age, 78% male and presenting with an ACS (unstable angina in 23.2%, NSTEMI in 52.4%, or STEMI in 24.4%), with tripple-vessel disease in 82.4% and left main disease in 47% and 35.4% diabetes. The average logistic EuroSCORE-I was 12.7 ± 17.2%. Among the cohort, 1652 patients (56.7%) received crystalloid cardioplegia and 1260 (43.3%) received blood cardioplegia (with warm blood in 316 (10.9%) and 944 patients (32.4%) cold blood).

Patients who received blood cardioplegia had a significantly higher MACCE rate compared to crystalloid cardioplegia (19.7% vs. 9.1%, P<0.001), particularly in NSTEMI and STEMI patients. Non-parametric multivariate regression confirmed blood cardioplegia as an independent predictor of adverse clinical outcomes in these subgroups. IHM (8.3% vs. 7.4%, P=0.36) and CD (6.1% vs. 5.6%, P=0.63) were similar between blood and crystalloid cardioplegia, respectively.

Conclusions: This large-scale national registry demonstrates that on-pump CABG with cardioplegic arrest remains an important and prevalent surgical treatment strategy for ACS patients. Since the choice between blood and crystalloid cardioplegia was about equally divided, blood cardioplegia was associated with a significant increase of MACCE. Non-parametric multivariate regression analysis revealed blood cardioplegia to be independently predictive for unfavorable clinical outcomes in NSTEMI and STEMI patients.

SEX-RELATED DIFFERENCES IN OUTCOMES OF CORONARY ARTERY BYPASS GRAFT SURGERY WITH ACUTE CORONARY SYNDROMES: A CURRENT REPORT FROM A SURGICAL MYOCARDIAL INFARCTION REGISTRY

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Background-Aim: While there is growing evidence that females have inferior outcomes and poorer prognosis after elective CABG compared to males, this relationship is poorly characterized in the setting of CABG for acute coronary syndromes (ACS). We therefore aimed to investigate sex-related differences in patients with ACS undergoing CABG on a multicenter basis in a large-scale registry.

Methods: Multicentric data were obtained from '*The North-Rhine-Westphalia Surgical Myocardial Infarction Registry*' with >120 patients characteristics and outcome variables. Primary study endpoint was in-hospital mortality (IHM). Secondary endpoints were cardiac-related death (CD), and major adverse cardiac and cerebrovascular events (MACCE) during index hospitalization. Multivariate logistic and non-parametric regression models were constructed to evaluate independent risk factors. Multivariate distributions of different groups were compared and the null hypothesis that underlying distributions are all equal was tested. A multiple testing procedure was incorporated to maintain the family-wise error rate in the non-parametric model.

Results: Between 01/2010 and 03/2023, a total of 3114 subjects with ACS were reported and entered. Patients were 67.4±11 years of age, 685 (22%) females and 2429 (78%) males, presenting ACS (UAP: 22.8%, NSTEMI: 51.6%, STEMI: 24%) with 46,2% left main disease, 82,3% triple-vessel disease and a logEuroSCORE-I of 16.4±17.2%. Baseline data and risk factors differed significantly between females and males: age (P=0.0019), body height (P<0.001), body weight (P<0.001) as well as the logEuroSCORE-I (P=0.0079). Female sex was associated with a significant increase of IHM (P<0.02), CD (P<0.02), and MACCE (P<0.04) as compared to males. ACS subtype analysis showed that females consistently had higher rates of IHM, CD and MACCE compared to males. Within ACS subtypes, females had a significantly higher IHM in UAP (P=0.041), higher rates of CD in NSTEMI (P=0.048), and a

tendency towards higher MACCE rate in STEMI (*P*=0.070). Multivariate logistic regression and non-parametric regression analyses identified female sex as an independent predictor of in-hospital mortality (*P*=0.006), CD (*P*=0.003) and MACCE (*P*=0.026).

Conclusions: In this multicenter registry, even after adjustment by parametric and non-parametric multivariate regression models, female sex was associated with inferior CABG outcomes in terms of IHM, CD and MACCE rate and was independently predictive in all subtypes of ACS.

THE IMPACT OF PREOPERATIVE ANTIPLATELET THERAPY ON PERIOPERATIVE OUTCOMES IN ACUTE TYPE A AORTIC DISSECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background-Aims: Acute Type A Aortic Dissection (ATAAD) is a surgical emergency, yet misdiagnosis as Acute Coronary Syndrome (ACS) frequently leads to preoperative administration of antiplatelet therapy (APT). The impact of APT on perioperative outcomes in ATAAD remains controversial, with conflicting evidence regarding its effects on bleeding, transfusion requirements, and mortality. Our meta-analysis aims to clarify the influence of preoperative APT on surgical and postoperative outcomes in ATAAD patients.

Methods: A thorough literature search was conducted using PubMed, Scopus, and the Cochrane Library to identify studies comparing perioperative outcomes in ATAAD patients with and without preoperative APT. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using RevMan 8.13.0, with heterogeneity assessed via the I^2 statistic. A subgroup analysis of propensity-matched studies (PMS) was performed, alongside sensitivity analyses to evaluate the robustness of the findings.

Results: We included five studies, comprising 2,789, of whom 361 (13.0%) had received APT prior to their ATAAD surgery. The subgroup analysis of only PMS identified a significantly higher use of rFVIIa in the APT group [OR 1.8; 95% CI 1.0 to 3.4; p = 0.05; I^2 = 0%]. However, in the overall cohort no significant differences were observed in mortality, incidence of postoperative MI, stroke, or major bleeding events. Additionally, no differences in transfusion requirements for RBC, platelets, plasma or rFVIIa use were noted between the two groups. Similarly, operative metrics including operation time, cardiopulmonary bypass time, aortic cross clamp time, and circulatory arrest time as well as recovery metrics including intensive care unit stay and mechanical ventilation duration were comparable between the two groups.

Conclusions: Preoperative APT does not significantly impact surgical duration, postoperative recovery, transfusion requirements, incidence of postoperative complications, or mortality in ATAAD patients. These findings suggest that APT should not be considered a contraindication for emergency ATAAD surgery.

THREE-DIMENSIONAL RECONSTRUCTION AND PRINTING OF AORTIC BIOPROSTHETIC VALVE USING PORTABLE 3D SCANNING AND POWDER FUSION TECHNOLOGY

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BACKGROUND-AIM: Three-dimensional (3D) reconstruction of cardiac valves supports pre-operative planning, surgical training, and prosthetic valve evaluation. This study presents a high-precision 3D modelling approach for aortic bioprosthetic valve replication, integrating portable scanning technology with Powder Bed Fusion (PBF) additive manufacturing. This method seamlessly integrates imaging and manufacturing, improving surgical accuracy, procedural efficiency, and prosthetic customization.

METHODS: A portable Artec Eva structured-light scanner was used to scan an SJM Epic™ Supra Valve (Model ESP-21, 21mm, St. Jude Medical). This scanner captures complex morphological features with sub-millimeter accuracy. Data processing was performed in Artec Studio, using registration, data fusion, and mesh smoothing algorithms. The final .STL file was manufactured via PBF, ensuring high-resolution, mechanically robust prosthetic fabrication. Unlike patient-derived imaging methods, this approach focuses on direct prosthetic replication, reducing processing time, enabling point-of-care customization, and enhancing structural accuracy

RESULTS: The 3D-printed model accurately replicated the bioprosthetic valve's morphological characteristics, demonstrating high structural integrity and precision. Structured-light scanning captured fine anatomical details, while PBF printing ensured robustness. Our study highlights the advantages of portable 3D scanning in prosthetic modelling, providing enhanced precision, adaptability, and efficiency compared to conventional techniques. The combination of 3D scanning and printing holds promise for surgical education, preoperative training, and research applications. These findings are particularly relevant to aortic valve surgery, where precise prosthetic customization enhances surgeon preparation and procedural understanding. Future research will focus on refining simulation capabilities and material properties.

CONCLUSIONS: This study advances aortic valve simulation and education by integrating portable 3D scanning and powder-based additive manufacturing. By setting a new standard for patient-specific simulation models, this research bridges the gap between 3D technology and cardiac surgery, offering a scalable solution for training future surgeons and improving procedural accuracy. The ability to fabricate patient-specific prostheses enhances surgical training and procedural planning. Given its relevance to aortic valve surgery education, this technique has strong potential for improving preoperative planning and training methodologies. Future developments will enhance its integration into simulation-based learning environments, ensuring greater accessibility to customized cardiovascular models.

CLINICAL OUTCOMES OF BEST CONTEMPORARY FROZEN ELEPHANT TRUNK PLATFORM: A SYSTEMATIC REVIEW & META-ANALYSIS

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Background & Aims: Frozen elephant trunk (FET) for total arch replacement (TAR) include the Thoraflex, E-vita, Frozenix, Cronus, and the Ascyrus Medical Dissection Stent (AMDS). Evidence is lacking in comparative studies that address the superiority of these devices, respective applications, and the associated outcome reporting. This meta-analysis aims to conduct a comparative evaluation of neurological outcomes related to these FET devices.

Methods: A comprehensive review was conducted utilizing various electronic databases and specific search criteria following the protocols established in the Cochrane Handbook and PRISMA-2020 guidelines. 114 studies involving 13,051 patients were identified meeting the predetermined inclusion and exclusion criteria. Proportional meta-analysis and meta-regression analysis for all outcomes were performed employing the Comprehensive Meta-Analysis Software v4.

Results: Incidence rates of permanent neurological deficits (PND), temporary neurological deficits (TND), spinal ischemia (SI) or paraplegia, delirium, and recurrent laryngeal nerve (RLN) injury have been reported as 6.5%, 5.3%, 4%, 11.5%, and 5.1%, respectively. Device-specific incidence rates for PND demonstrated variability, ranging from 4% associated with Cronus to 8.8% associated with Thoraflex. TND incidence varied from 4.1% (Cronus) to 31.3% (AMDS), while SI/paraplegia rates ranged from 0% (AMDS) to 7% (E-vita). Rates of delirium were reported between 5.5% (Cronus) and 28% (AMDS), and RLN injury rates ranged from 0% (AMDS) to 9.7% (Thoraflex). The average hypothermic circulatory arrest (HCA) time was 52.3 minutes (95% CI: 48.2-56.4, I^2 = 99%). A sub-analysis assessing the correlation between HCA time and incidence of PND revealed a non-significant relationship (Regression Coefficient = 9.46, p = 0.9195). However, a comparative analysis of HCA times across different devices indicated a statistically significant difference (p = 0.004), particularly between AMDS and Cronus, with a mean difference of -46.5 minutes (p = 0.0058). Meta-regression analysis examining the relationship between PND and CPB time indicated a significant correlation (Odds Ratio: 1.007, p = 0.0003). A 1 minute increase in CPB time is associated with an increase of 0.07% in the rate of PND. Analysis of the relationship between distal anastomosis zones utilized for FET and rates of PND did not yield a significant correlation (Regression Coefficient = -0.006, p = 0.9573).

Conclusion: Although FET yields more favorable neurological outcomes in comparison to alternative methods for aortic arch repair, there exists considerable variability in the aorta-related characteristics among the available devices. Notably, Cronus appears to provide the most advantageous neurological profile; however, its application is geographically restricted and must be taken into consideration.

CLINICAL IMPACT OF DIFFERENT PRE- AND POSTOPERATIVE PLATELET FUNCTION TESTING IN CORONARY ARTERY BYPASS GRAFTING SURGERY

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Background/Aim: Postoperative bleeding is a significant contributor to increased morbidity and mortality in CABG patients, with data from the STS database indicating that 41% of patients receive blood products post-surgery and nearly 3% of patients undergo reoperation for bleeding. The primary objective was to investigate the correlation between preoperative impedance aggregometry results and the rates of increased postoperative bleeding and transfusion .Secondly, we aimed to determine if postoperative viscoelastic test results are associated with greater postoperative bleeding and transfusion requirements in patients identified as high bleeding risk by preoperative impedance aggregometry.

Methods: All patients underwent impedance aggregometry testing prior to surgery, and viscoelastic testing was conducted after weaning off CPB. The Multiplate® impedance aggregometry test was used to assess platelet function impaired by aspirin, clopidogrel, or ticagrelor. The cut-off values used for ASPI were > 453 and for ADPhs > 602 as the markers for low risk of bleeding (cut-off values were previously established for our patient population).Postoperatively, the ClotPro® viscoelastic test was used to assess coagulation status and the need for transfusion.

Results: ADPhs was significant predictor of total blood loss > 500ml (area 0.61, p=0.041) . ASPI was significant predictor of total blood loss > 1000ml (area 0.62, p=0.005) . EXTEM A10 and CFT were significant predictors of total blood loss > 500ml(EXA10 area 0.44, p=0. 006EXCFT area 0.56, p = 0.08).EXTEM A10 and CFT were significant predictors of total transfusion rate (EXA10 area 0.36, p=0.001EXCFT area 0.59, p = 0.001). EXTEM CFT was significant predictor of total blood loss in patients marked as high beleeding risk by ADPhs (ADPhs area 0.38, p=0.001,ASPI area 0.51, p = 0.79). EXTEM A10 was significant predictor of total blood loss in patients marked as high beleeding risk by ADPhs (ADPhs area 0.41, p=0.01, ASPI area 0.47, p = 0.43)

Conclusions: Impedance aggregometry testing serves as a useful screening tool for identifying CABG patients at risk of increased postoperative bleeding, with specific thresholds advised for different populations.Postoperative viscoelastic tests, following cardiopulmonary bypass use, significantly predict higher blood loss and the need for transfusions. The correlation between postoperative viscoelastic test results and preoperative ADPhs test outcomes helps identify high bleeding risk patients, a correlation not observed with preoperative ASPI test results. Preoperative impedance aggregometry, combined with postoperative viscoelastic testing, should be integrated into perioperative protocols for patient blood management in high bleeding risk on-pump CABG patients.

CONCURRENT CAROTID ENDARTERECTOMY AND CORONARY ARTERY BYPASS GRAFTING VS. ISOLATED CORONARY ARTERY BYPASS GRAFTING: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RCTS AND PROPENSITY-MATCHED STUDIES

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Background-Aims: Patients with concomitant carotid and coronary artery disease face a surgical dilemma, with ongoing debate over whether CABG alone or concurrent carotid endarterectomy (CCC) offers better outcomes. Conflicting evidence has led to weak ACCF/AHA guidelines (Class IIa/b, Level C), reflecting the lack of high-quality data. While some studies suggest CCC reduces stroke risk, others report increased perioperative morbidity without a survival benefit. Our meta-analysis aims to clarify these uncertainties and guide surgical decision-making.

Methods: A thorough search of the literature was conducted in PubMed, Scopus, and Cochrane Library to identify randomised controlled trials and propensity matched studies involving patients with concurrent coronary and carotid artery disease who underwent either isolated CABG or CCC. Pooled statistical analyses, including odds ratios (OR) and mean differences (MD) with 95% confidence intervals, were performed using RevMan 8.13.0.

Results: A total of five studies, encompassing 23,916 patients, were included, with 29% undergoing CCC. CCC was associated with a significantly higher incidence of stroke compared to CABG alone [OR 1.47; 95% CI 1.07-2.00; p = 0.03; I^2 = 17%], indicating an increased perioperative neurological risk. However, 30-day mortality did not differ significantly between the two groups [OR 1.23; 95% CI 0.33-4.56; p = 0.68; I^2 = 85%]. Similarly, there were no significant differences in major adverse cardiovascular events (MACE) [OR 1.10; 95% CI 0.49-2.51; p = 0.75; I^2 = 91%], myocardial infarction (MI) [OR 0.93; 95% CI 0.17-5.06; p = 0.87; I^2 = 23%, or hospital length of stay [MD 1.85 days; 95% CI -11.91 to 15.61; p = 0.34; I^2 = 93%].

Conclusion: Our findings suggest that while combined revascularisation may not confer a mortality benefit or reduce cardiovascular complications, the elevated stroke risk warrants careful patient selection. Given the lack of clear survival benefit, further high-quality randomised controlled trials are needed to refine surgical guidelines and optimise patient outcomes.

HEMODYNAMIC SUPPORT WITH PERCUTANEOUS DEVICES IN PATIENTS WITH CARDIOGENIC SHOCK: THE CURRENT EVIDENCE OF MECHANICAL CIRCULATORY SUPPORT

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Background: Cardiogenic shock (CS) is a life-threatening condition resulting from primary cardiac dysfunction, leading to systemic hypoperfusion and multi-organ failure. Despite advances in medical therapy, mortality rates remain alarmingly high, ranging from 40% to 60%. Mechanical circulatory support (MCS) devices, such as intra-aortic balloon pumps (IABP), Impella, TandemHeart, and venoarterial extracorporeal membrane oxygenation (VA-ECMO), have emerged as critical interventions in managing CS by restoring hemodynamic stability. This review evaluates the current evidence on percutaneous MCS devices and their impact on patient outcomes.

Methods: This literature review synthesizes findings from clinical trials, randomized controlled trials (RCTs), and meta-analyses assessing the use of percutaneous MCS devices in patients with CS. A comprehensive literature search was performed across multiple electronic databases to identify relevant data and information.

Results: IABP, although a longstanding MCS option, demonstrated no significant reduction in mortality in large trials such as IABP-SHOCK II, with 30-day mortality rates comparable to the control group (39.7% vs. 41.3%). Impella devices showed mortality rates ranging from 48.5% to 77%, depending on institutional expertise. However, Impella devices provide enhanced left ventricular unloading and higher cardiac output augmentation, yet they are associated with increased vascular complications and major bleeding. Meta-analyses suggest Impella does not significantly reduce mortality compared to IABP (p=0.45) but provides superior hemodynamic support. TandemHeart, offering up to 6L/min of cardiac output, has demonstrated improved cardiac indices; however, it is associated with higher incidences of severe bleeding and limb ischemia. VA-ECMO, providing robust biventricular support, has seen a twenty-three-fold increase in utilization, yet mortality remains high, with rates ranging from 43% to 86%. Despite its effectiveness in severe cases, VA-ECMO increases left ventricular afterload, necessitating adjunct unloading strategies such as IABP. Moreover, VA-ECMO also carried a high risk of complications such as bleeding (40.8%), infection

(30.4%), and acute kidney injury (55.6%).

Conclusions: Percutaneous MCS devices play an indispensable role in the management of CS, each with distinct advantages and limitations. While no single device has demonstrated unequivocal superiority in reducing mortality, device selection should be tailored to patient-specific hemodynamic needs. Future research should focus on refining patient selection criteria, optimizing timing of device implementation, and developing standardized protocols to enhance survival outcomes. Multidisciplinary collaboration remains essential to improving management strategies for CS patients.

Thursday May 15,2025
Conference Room 2
15.00-16.40

THE POST-IMPLANTATION SYNDROME AND ITS OUTCOME AFTER ELECTIVE ENDOVASCULAR REPAIR OF ABDOMINAL AORTIC ANEURYSM WITH THE NEWEST 4TH GENERATION DEVICES

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Background-Aim: Postimplantation syndrome (PIS) is a systemic inflammatory response occurring in the early phase after endovascular repair for abdominal aortic aneurysm (AAA). The aim of the study is to evaluate the inflammatory response and its outcome after elective standard endovascular repair of abdominal aortic aneurysms (EVAR) with newer-generation devices.

Methods: Consecutive patients undergoing standard EVAR were included in the study from August 2024 to March 1, 2025. Patients with perioperative infection, cancer, autoimmune disease, and those receiving long-term anti-inflammatory medications were excluded. Epidemiological characteristics, comorbidities, temperature, white blood cell count, C-reactive protein (CRP), platelet count, serum interleukin IL-6 concentration, creatinine, urea, and coagulation parameters (INR, PT, APTT, fibrinogen) were measured preoperatively, 24, and 48 hours postoperatively. To analyze changes in biomarker levels and assess the potential impact of endograft type, pairwise differences between time points and post-hoc pairwise comparisons were performed using Bonferroni correction to control for multiple comparisons, ensuring a more conservative estimate of significance.

Results: The study included 63 consecutive patients. The type of endograft implanted was Ankura-Lifetech: 13, Treovance-Bolton: 10, Excluder-Gore: 9, AFX-Endologix: 5, Zenith-Cook: 4, Endurant-Medtronic: 4, Alto-Endologix: 4, Incraft-Perquios: 3, Altura-Lombard: 2, Anaconda-Terumo: 1. Changes in biomarker levels and differences between time points are described in Table 1. After endovascular repair, there was a significant decrease in Hb and PLT levels, while WBC, CRP, and IL-6 showed a significant increase (Table). Renal function markers showed small variations without clinical significance. The type of endograft (manufactured polyester vs. polytetrafluoroethylene) did not significantly affect the trends of biomarkers postoperatively. Platelet count decsrease reflects platelet consumption or aneurysm sac clotting after surgery. The postoperative increase in fibrinogen levels reflects an acute phase response that potentially contributes to transient hypercoagulability. Subgroup analysis was not able to show significance between individualized different types of endografts.

Conclusions: The postimplantation syndrome was apparent during the first 24 and 48 hours postoperatively and was not associated with perioperative adverse clinical events showing a benign course.

ULTRASOUND DIAMETER-BASED GRADING IN CAROTID ARTERY STENOSIS

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Background-Aim: Flow velocity measurement and spectral analysis by duplex ultrasonography (DUS) are widely recognized as standard methods for assessing carotid stenosis. While angiographic methods rely on diameter-based grading, its application in DUS remains limited. This study evaluated the use of diameter-based grading using ultrasonography.

Methods: Patients who underwent a bilateral carotid ultrasound in our institution were included in the study. Patients >50% diameter stenosis, previous carotid interventions and non-atherosclerotic conditions were excluded. The internal carotid artery diameter (ICAd) was assessed on both sides. Using tri-axial DUS measurements (anterior, lateral, and posterior windows), the minimal residual lumen (MRL) was assessed. The maximum peak systolic velocity (PSV), end-diastolic velocity (EDV) and degree of spectral broadening within each ICA was also recorded.

Results: There were 400 arteries in 200 patients (100 male, 100 female) with a mean age of 67 years (range 50-87). The mean distal ICA diameter was 4.8 mm (95% CI: 4.7-4.9), with males having a larger mean ICAd (5.1 mm) compared to females (4.5 mm). Among all patients, only 3 females had an ICAd <4.0mm (1.5% among females and 0.75% among all patients). For detecting >50% ICA diameter stenosis, an MRL of ≤2 mm demonstrated a detection rate of 99% overall (100% in males, >98% in females). For detecting >75% ICA diameter stenosis, an MRL of ≤1 mm had a detection rate of 99% overall (100% in males, >98% in females).

Conclusion: Given that ICAd is ≥4.0mm almost in all patients, an MRL of 2mm is a safe cut-off for detecting a >50% diameter stenosis. Furthermore, a cut-off at 1mm would detect equally well a >75% diameter stenosis. As the ICAd is often larger than the 4mm used here, the above cut-off values would only underestimate stenosis.

INFLUENCE OF LATENCY AND APPLIED FORCE ON ACCURACY IN AN ENDOVASCULAR SIMULATION TASK: INSIGHTS FOR ROBOTIC TELESURGERY

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Background-Aim: Accurate force application and control are critical in endovascular procedures, which may be compromised by latency in robotic or telesurgical systems. The aim of this study was to examine the impact of latency and applied force on accuracy in an endovascular procedure simulation task and to assess the potential of haptic feedback in enhancing task accuracy.

Methods*:* A prospective, cross-sectional experimental study was conducted using a custom-build endovascular procedure simulator. In this study, 116 healthy volunteers performed a task where they were asked to maintain a target force (0.6N, 1.2N, or 1.8N) under different latency conditions (0, 100, 200, and 400 ms). The time duration for which participants successfully maintained the target force within the 10-second interval was recorded. The impact of latency and force was evaluated across three distinct age groups: Group 1 (18-25 years), Group 2 (35-45 years), and Group 3 (55-65 years).

Results*:* The youngest group consistently achieved the best results, while the oldest group showed the lowest results across all tasks. The Kruskal-Wallis test found statistically significant performance differences between age groups ($p<0.05$). Post hoc analysis revealed a statistically significant gap between the youngest and oldest groups in all tasks. The Friedman test indicated significant differences across force and latency conditions ($p<0.05$). Post hoc analysis further confirmed significant variations between all force and latency conditions, except for the 400 ms latency, where no significant difference was observed between 1.2N and 1.8N ($p>0.05$). Spearman's correlation analysis showed a strong negative correlation between latency and duration ($\rho=-0.642$) and a weak negative correlation between force and duration ($\rho=-0.257$), emphasizing the substantial effect of increased latency on task performance. *Conclusions*: This study demonstrated that increasing latency and higher applied force both impair performance, with latency having a more substantial impact. These results emphasize the importance of minimizing latency, particularly in older populations. Additionally, the findings suggest that haptic feedback technology may be more beneficial at lower force levels, warranting further investigation of its potential benefits.

THE IMPACT OF FRAILTY AND CLINICAL RISK FACTORS ON GROIN INFECTIONS AND POSTOPERATIVE OUTCOMES FOLLOWING CLEAN VASCULAR PROCEDURES

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BACKGROUND-AIM: Surgical site infections in the groin following clean vascular procedures are associated with significant morbidity, increased healthcare costs, and adverse postoperative outcomes. While established risk factors such as obesity, diabetes, and reintervention have been widely studied, the role of frailty remains underexplored. This study aims to evaluate the impact of frailty on the incidence of groin infections and its correlation with adverse clinical outcomes, including reintervention, amputation, and mortality. Clean vascular surgery is defined as planned, non-emergency and emergency procedures performed without pre-existing infection. Understanding the role of frailty in these patients could help refine preoperative risk stratification.

METHODS: A retrospective, single-center observational study was conducted on patients who underwent clean vascular groin surgery between August 2022 and December 2023. Frailty was assessed using the Clinical Frailty Score (CFS). The primary endpoint was the incidence of groin infections, classified according to the Centers for Disease Control and Prevention (CDC) criteria. Secondary endpoints included reintervention, limb amputation, and all-cause mortality, as these are strongly correlated with infection and can be impacted by frailty. Univariate and multivariate logistic regression analyses were employed to identify independent predictors of groin infections and postoperative complications. The study aimed to evaluate the potential mechanisms through which frailty contributes to poor outcomes.

RESULTS: A total of 357 groins of 308 patients were included, with a median follow-up period of 20 months. The overall incidence of groin infections was 16.8%. High frailty (CFS ≥5) was independently associated with an increased risk of groin infections (OR: 2.83, p=0.0003), reintervention (OR: 5.79, p<0.0001), amputation (OR: 6.95, p<0.0001), and mortality (OR: 2.42, p=0.0078). Diabetes (OR: 2.75, p=0.0004) and hypoalbuminemia (OR: 0.92 per 1g/L decrease, p=0.0003) were also identified as significant predictors of infection and adverse outcomes. Hypoalbuminemia is thought to contribute to impaired immune response, thus increasing the risk of infection.

CONCLUSIONS: Frailty is a critical determinant of surgical site infections and postoperative morbidity in patients undergoing vascular groin procedures. Incorporating frailty assessment into preoperative risk stratification may facilitate more precise patient selection and perioperative management. Targeted interventions addressing frailty-associated vulnerabilities could potentially mitigate the incidence of infections and improve long-term surgical outcomes.

EVALUATING THE CLINICAL PROFILE OF THORACIC ENDOVASCULAR AORTIC REPAIR IN BLUNT THORACIC AORTIC INJURY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background & Aims: Blunt thoracic aortic injury (BTAI) is a critical vascular emergency associated with high mortality rates. Thoracic endovascular aortic repair (TEVAR) is considered the gold-standard treatment for this condition. This meta-analysis seeks to provide a comprehensive evaluation of the clinical profile and outcomes associated with TEVAR in the management of BTAI.

Methods: A systematic review was undertaken using a rigorous methodology. This involved conducting searches across multiple electronic databases using defined search terms while adhering to stringent pre-established inclusion and exclusion criteria in accordance with the Cochrane Handbook and the PRISMA-2020 guidelines. Proportional meta-analysis was executed using Comprehensive Meta-Analysis software (version 4).

Results: A total of 117 studies comprising 29,972 patients were analyzed. The mean age was 42.3 years, with 74.9% being male. The mean Injury Severity Score (ISS) was 35.9, and the distribution of spinal cord injury grades was as follows: Grade 1 at 8%, Grade 2 at 18.1%, Grade 3 at 62.3%, and Grade 4 at 14.9%. The in-hospital and 30-day mortality rate was reported at an aggregated rate of 6.2%. A meta-regression analysis investigating the relationship between mortality and delayed intervention (defined as greater than 24 hours) demonstrated a significant inverse correlation (Regression Coefficient: -3.3, P-value=0.0007, I^2=87.9%). The incidence of postoperative stroke and endoleak was aggregated at 3.2% and 3%, respectively. Coverage of the left subclavian artery (LSA) was noted in 37.3% of the patients. A sub-analysis was performed to examine the association between BTAI grade and 30-day mortality, which indicated a weak and non-significant correlation (Regression Coefficient: 0.455, P-value=0.2588). Additionally, a meta-regression assessing the relationship between LSA coverage and left arm symptoms did not yield a significant re-

lationship (Regression Coefficient: 2.46, P-value=0.5524, I^2=85.8%). However, a significant inverse relationship was identified between LSA coverage and stroke incidence (Regression Coefficient: -7.4, P-value=0.0272, I^2=84.7%).

Conclusion: The management of BTAI poses significant challenges due to its associated high morbidity and mortality rates. However, TEVAR has emerged as a safe and effective intervention, yielding favourable outcomes for patients. Early diagnosis and timely referral to trauma centres equipped with TEVAR capabilities are essential to enhance survival rates and overall patient prognosis. Continued emphasis on these critical factors is necessary to improve the treatment of BTAI.

TEVAR VERSUS OPTIMAL MEDICAL THERAPY FOR UNCOMPLICATED TYPE B AORTIC DISSECTION - A SYSTEMATIC REVIEW & META-ANALYSIS

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Background-Aim: This meta-analysis reviewed outcomes of patients with uncomplicated Type B aortic dissection (unTBAD) treated with either thoracic endovascular aortic repair (TEVAR) plus optimised medical therapy (OMT) or OMT alone. The study evaluated both short-term and long-term outcomes to assess whether TEVAR improved overall mortality and reduced complications such as retrograde type A dissection, stroke, paraplegia, and aortic remodelling.

Methods: We conducted comprehensive searches on PubMed, Ovid, Scopus, and EMBASE to identify studies comparing long-term outcomes of TEVAR and OMT for Uncomplicated Type B Aortic Dissection. Using the PICO framework and adhering to PRISMA guidelines, we formulated the search query. The search was limited to titles and abstracts and included thorough citation reviews. Each study was evaluated against strict inclusion and exclusion criteria for eligibility. Statistical analysis was performed using Jamovi (Version 2.5) from the Jamovi project (2024).

Results: The total number of patients with uncomplicated Type B aortic dissection is 25650, with 21041 receiving optimal medical therapy (OMT) and 4,609 treated with TEVAR. The OMT group had an average age of 61.7 years, with 69.7% treated in the acute phase (<15 days). Their mean maximum aortic diameter was 38.5 mm, and the false lumen diameter averaged 25.4 mm. In the TEVAR group, the average age was 59.7 years, with 76.2% treated acutely. The average maximum aortic diameter was 40.2 mm, and the false lumen diameter was 26.4 mm. A pooled analysis showed no significant difference in 30-day and in-hospital mortality rates (log odds ratio 0.1058, p = 0.4971). However, a random-effects model indicated a log odds ratio of -1.3696, resulting in an odds ratio of 0.2542 (p < 0.0001). Survival rates were 95.4% for the OMT group and 98% for the TEVAR group. At 1 year, survival was 90.2% for the OMT group (95% CI: 85.7-90.7) and 94% for the TEVAR group (95% CI: 90.6-

97.5). At 2 years, OMT survival was 71.8% (95% CI: 63.4-80.1) compared to 83.7% for TEVAR (95% CI: 75.6-91.8). At 3 years, survival was 82.2% for OMT (95% CI: 77.4-87) and 89.9% for TEVAR (95% CI: 86.1-93.7).

Conclusions: The role of Thoracic Endovascular Aneurysm Repair (TEVAR) in managing uncomplicated Type B Aortic Dissection (unTBAD) remains debated. While studies show improved aortic remodelling post-TEVAR, there is no definitive evidence for increased survival rates. It is essential to conduct randomised trials and develop guidelines that include high-risk features for assessing this complex patient group.

NOVEL MECHANICAL THROMBECTOMY TECHNIQUES FOR UPPER EXTREMITY DEEP VEIN THROMBOSIS: A SINGLE CENTER CASE-SERIES

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Abstract: Background-Aim: Upper extremity deep vein thrombosis (UEDVT) has been widely managed with anticoagulation and selectively with catheter directed thrombolysis (CDT) targeting prompt venous recanalization. CDT, however, comes with a bleeding risk and complex perioperative logistics. Novel percutaneous mechanical thrombectomy (MT) devices can potentially simplify the procedure, its safety and efficacy though remain unknown.

Methods: In this single center study, we review the outcomes on 8 patients with symptomatic UEDVT treated with 3 different devices: the ClotTriever system (Inari Medical, Irvine, CA), the Aspirex Mechanical Aspiration Thrombectomy System and the Penumbra System (Penumbra Inc, Alameda, California, USA), with or without subsequent first rib resection and venoplasty.

Results: MT through basilic or brachial vein access was performed and successfully completed in all 8 patients. No major adverse events were noted and the patients were discharged within 24 hours. Five out of 8 patients underwent subsequent first rib resection and for 3 of them balloon venoplasty was additionally performed. At 2 years mean follow up, 6 out of 8 patients were free of symptoms without UEDVT recurrence. Two patients had partial symptom relief, one of them due to re-thrombosis.

Conclusion: For the management of symptomatic UEDVT, mechanical thrombectomy using novel technologies is feasible with high technical and clinical success.

PREEMPTIVE TEVAR AFTER TYPE I AORTIC DISSECTION REPAIR: THE ERADICARE TRIAL ON AORTIC REMODELING AND MID-TERM OUTCOMES

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Objectives: Persistent distal false lumen following surgery for DeBakey type I acute aortic dissection (AAD) is associated with an increased risk of adverse aortic events (AAEs). This pilot randomized controlled trial aimed to assess whether elective thoracic endovascular aortic repair (TEVAR), performed 1-3 months after type I AAD surgery in selected high-risk patients, promotes aortic remodeling and improves clinical outcomes.
Methods: Thirty-two patients who underwent surgical repair for type I AAD were randomized to either elective TEVAR (n = 15) or standard conservative management (n = 17). Eligibility criteria based on CT angiography included: (a) a re-entry tear in Ishimaru zones 3 or 4, and (b) a maximum descending thoracic aorta (DTA) diameter >40 mm and/or a false lumen diameter >20 mm. One-year follow-up included clinical assessment and CT angiography.
Results: The TEVAR group exhibited significantly more favorable aortic remodeling than the conservative group, as demonstrated by greater reductions in total aortic diameter (zones 2-9), greater increases in true lumen diameter (zones 3-8), and greater reductions in false lumen diameter (zones 2-8). Complete false lumen thrombosis was also more frequent in the TEVAR group (zones 2-6). Clinically, the TEVAR group had significantly lower rates of dissection extension (0% vs. 29.4%; $p = 0.050$), rehospitalization due to complications (0% vs. 58.8%; $p < 0.001$), and long-term AAEs (20.0% vs. 58.8%; $p = 0.026$).
Conclusions: In selected high-risk patients, performing TEVAR 1-3 months after surgical repair of type I AAD promotes aortic remodeling and improves mid-term clinical outcomes.

DEEPSEEK AND GRAPHRAG MAKE AN ALMOST FLAWLESS EVIDENCE-BASED TOOL FOR CARDIOVASCULAR CLINICAL DECISION-MAKING

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Background-Aim: Artificial intelligence (AI) can change medical practice only if accurate, reliable, and evidence-based output is available. Large Language Models (LLMs) provide valuable insights into medical literature by synthesizing vast amounts of medical literature, However, issues such as "hallucinated" facts, inconsistent responses, and inadequate documentation persist. To solve these challenges, DeepSeek R1 is combined with a Graph Retrieval Augmented Generation (GraphRAG) approach. This study evaluated the system's accuracy, consistency, and transparency when asked questions on the "2021 ESC Guidelines on cardiovascular disease prevention in clinical practice".

Methods: A pipeline has been developed that integrates knowledge graph creation, question parsing, document retrieval, and response generation. ESC Guidelines 2021 were incorporated into the knowledge graph, which facilitates structured, node-edge-based navigation of key concepts and recommendations. DeepSeek R1 answered queries by consulting graph-based evidence nodes, ensuring all outputs were firmly grounded in the retrieved information. We tested the pipeline against a series of 34 questions adapted from the "CardioNerds Decipher the Guidelines" initiative which is a trusted source of cardiovascular education. Each answer was assessed for correctness, citation of guidelines, and consistency when re-queried.

Results: The system correctly answered 33 of 34 questions, achieving an accuracy of 97%. For the remaining question, which fell outside the scope of the ESC Guidelines, DeepSeek R1 accurately identified that the requested information was unavailable within the knowledge base. It is noteworthy that no hallucinatory data or spurious citations were detected, underscoring the reliability of the GraphRAG approach. The results of repeated testing were consistent, with each answer referring directly to specific guideline sections. With this evidence-based, citation-driven framework, users could verify results quickly and remain confident in the system's outputs

Conclusions: Integrating DeepSeek R1 with Graph Retrieval Augmented Generation workflow, we demonstrate a high-performing, transparent, and reliable AI-driven clinical decision support tool, achieving 97% accuracy in a cardiovascular guideline-based evaluation. The knowledge graph's structured representation ensures that all responses remain grounded in verifiable evidence, which eliminates hallucinations and enhances user confidence. As AI continues to evolve, this approach provides a scalable blueprint for evidence-based practice across many fields of medicine.

FIRST-IN-EUROPE USE OF A TAPERED SELF-EXPANDING BRIDGING DEVICE IN ENDOVASCULAR THORACOABDOMINAL AORTIC ANEURYSM REPAIR

Efthymios Beropoulis, Konstantinos P. Donas

Introduction: Bridging devices in endovascular thoracoabdominal aortic aneurysm repair are key factors in term of sufficient and durable exclusion of the treated pathologies. In an era of balloon expandable covered stents, self-expanding endografts can address issues such as severe kinking and elongation of the target vessels.

Results: A 73-year-old female patient with a symptomatic thoracoabdominal aortic aneurysm (TAAA) and severe elongation of the left renal artery was treated endovascularly by the G-Branch device, at our institution. The left renal artery had a diameter of 5mm, upward orientation and stenosis of the orifice of the left renal artery. After deployment of the multibranched device and the cannulation of the left renal branch, different catheters and wires were used to achieve a stable position of the Rosen wire (Cook) and advance over the 7F sheath the Silverflow endoprosthesis (Lifetech) with a tapered design of 5mm distally and 7mm proximally. The trackability and placement accuracy of the device despite the challenging anatomy was very satisfactory. Completion angiography ensured free flow to the renal artery and also exclusion of the aneurysm. Post-operative computed tomography angiography confirmed the stenosis-free patency of the endoprosthesis and organ perfusion.

Conclusions: First-in-Europe use of a tapered self-expanding bridging device in endovascular thoracoabdominal aortic aneurysm repair was successful and promising. Further data and meticulous follow up is needed.

GENDER-BASED DIFFERENCES IN OPEN AND ENDOVASCULAR TREATMENT OF PERIPHERAL ARTERIAL DISEASE IN DIABETIC PATIENTS

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Background-Aim: Periferal arterial disease (PAD) manifests as claudication, ischemic rest pain or tissue loss. While PAD prevalence is similar or higher in women, the relationship between risk factors, PAD symptoms and treatment outcome varies by sex. The aim of this study is to analyze the outcomes of open and endovascular treatment of PAD in patients with diabetes based on gender.

Methods: This is retrospective analysis of patient data from 2018 to 2022. The primary outcome was to compare amputation free survival between male and female diabetic patients with PAD treated with open or endovascular treatment.

Results: Study included 420 diabetic PAD patients, 307 (73.1%) males and 113 (26.9%) females. In females most prevalent comorbidities were hypertension (98.2% vs 89.6%, p=0.04) and stable angina pectoris (17.7% vs 5.5%, p<0.001). Men had more positive family history of cardiovascular disease 183 (59.6% vs 38.1%, p<0.001). Claudication's were more common in women (59.3% vs 38.4%, p<0.001), while wounds were more common in men (35.8% vs 17.7%, p<0.001). Among endovascular procedures femoropopliteal segment as target lesion was more common among female patients (60.7% vs 41.5%, p<0.001) and among men infrapopliteal segment (31.2% vs 9.6%, p<0.001). For open surgery female patients had more aortobifemoral surgery (90.4% vs 68.8%, p<0.001) and men had more femoropopliteal below the knee reconstruction (22.6% vs 7.4%, p<0.001). The mean follow up was 10 months. Major amputation occurred in 43 cases - 3 in the female group and in 40 in male group (p=0.001). Mean major amputation free period for women was 15 months (range: 0-54) while for men was 9 months (range: 0-51). Higher percentage of men had an amputation of the ipsilateral extremity prior to current open or endovascular procedures compared to women (12.4% vs 4.4%, p=0.017). During follow up period there was 1 (0.2%) death among men and it was not related to the revascularisation procedure.

Conculsions: This study revealed that male diabetic patients had a significantly higher incidence of PAD with wound presentation, as well as a greater rate of major amputations during follow-up, due to more distal atherosclerotic lesions when compared to female. These findings highlight the crucial need for early intervention and vigilant monitoring, particularly in male PAD diabetic patients.

PERIPHERAL GRAFT INFECTION - A RARE BUT TRICKY CONDITION THAT BRINGS ALONG SOME SERIOUS COMPLICATIONS

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Stent infections are a rare yet serious and potentially life-threatening complication following endovascular procedures. It is essential to understand their incidence, risk factors, clinical signs, treatment options, and outcomes to enhance patient care and improve overall results.We report a case of a 63-year old man with a pseudoaneurysm of the external iliac artery due to a stent infection that was successfully treated by performing a bypass using a reversed saphenous vein graft-a semi-NAIS technique- and performed a systematic review of the literature to identify the incidence about the epidemiology, clinical presentation, management, and prognosis of these rare cases of graft infections.

We included all the studies that were published until January 2025, reporting 33 patients with stent infection and 23 with stent graft infections.The average age of patients was 63 years, with 71% of them being male. The average time from implantation to infection was 390 days for stents and 786 days for stent grafts.Patients typically present with fever, leukocytosis, and local symptoms such as pain, swelling, abscess formation, and distal embolization. Stent infections in the abdominal area tend to manifest with more severe symptoms, often including abscesses, retroperitoneal hematomas, and pseudoaneurysms.Surgical removal of the infected stent was carried out in 87% of cases. In seven instances, the stent was not removed, and four of these cases were treated exclusively with antibiotic therapy. Revascularization was successfully achieved in 71% of patients, primarily through in situ vein bypass, with the second approach being an extra-anatomic synthetic bypass graft.

Peripheral graft infections are rarely reported, with the iliac arteries being the most commonly affected. These infections tend to present earlier and are associated with higher rates of amputation and mortality compared to other peripheral sites.

MANAGEMENT OF INTERNAL ILIAC ARTERY DURING ENDOVASCULAR TREATMENT OF AORTOILIAC ANEURYSMS- 3 YEAR EXPERIENCE OF OUR DEPARTMENT

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Background-aim: Iliac artery aneurysms are rare when occurring in isolation; however, they are often found in conjunction with abdominal aortic aneurysms in up to 40% of cases. When faced with an inadequate distal landing zone or aneurysmal iliac arteries, a decision must be made: either to relocate the landing zone more distally and sacrifice the internal iliac artery or to preserve it. This study aims to describe our early 3-year experience in endovascular management of internal iliac arteries.

Methods: From February 2022 to February 2025, forty-one consecutive patients with aortoiliac aneurysms were treated with endovascular techniques in our department.

Results: Men were 97.6% of patients, and their mean age was 75 years. Thirty patients underwent EVAR procedure with occlusion of one internal iliac artery (with or without embolization), three patients underwent bilateral IIA occlusion in order to treat type IB endoleaks, six patients received iliac branch devices and two patients received a stent-graft in the common iliac artery. Technical success was achieved at a rate of 100%, regardless of the technique employed, and no major complications or 30-day mortality were observed.

Conclusions: Occlusion of the internal iliac artery used to be the standard procedure to overcome sealing issues. The introduction of techniques for preserving the internal iliac artery represents a significant advancement in the treatment of aorto-iliac aneurysms, as they demonstrate high technical success and low morbidity while reducing the risk of pelvic ischemia.

Thursday May 15,2025
Conference Room 1
16.40 - 17.40

EARLY CABG WITH INTRAOPERATIVE HEMOADSORPTION IN PATIENTS ON TICAGRELOR: REAL WORLD DATA FROM THE INTERNATIONAL SAFE AND TIMELY ANTITHROMBOTIC REMOVAL (STAR) REGISTRY

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Objectives: Severe perioperative bleeding occurs in over 30% of patients on ticagrelor undergoing isolated coronary artery bypass grafting (i-CABG) before completing the recommended 3-day washout. Intraoperative ticagrelor removal with a polymer bead hemoadsorption device is an approved therapy that may reduce perioperative bleeding.

Methods: The current analysis from the international Safe and Timely Antithrombotic Removal (STAR) registry reports outcomes with intraoperative hemoadsorption in patients on ticagrelor undergoing i-CABG before completing the recommended washout. Bleeding was assessed by the Universal Definition of Perioperative Bleeding (UDPB) definition.

Results: 102 patients (63.8±10.1 years, 81.2% male) underwent i-CABG at mean time from last dose (TLD) of 22.8±14.6h. Groups were created based on TLD to CABG: Group-1 (G1): <24h (n=61; TLD 12.6±6.5h); Group-2 (G2): 24-72h (n=41; 37.2±10.1h). G1 was higher risk than G2 based on EuroSCORE-II (median: 4.2% vs. 1.7%, p=0.006) and emergency indication (66.1% vs. 12.2%, p<0.001). Operation and cardiopulmonary bypass durations were similar (G1: 4.3±1.5h and 94.9±37.1min vs. G2: 4.4±1h and 94.7±36.1min, p=ns). Severe bleeding (UDPB^{3}3) and re-operations for bleeding were more frequent in G1 vs. G2 (14.8% vs. 2.4%, p=0.047; and 8.2% vs. 0%, p=0.08, respectively). Any transfusion of red blood cells or platelets was also more frequent in G1 vs. G2 (45.9% vs. 26.8%, p=0.05 and 59.0% vs. 34.1%, p=0.014, respectively).

Conclusions: Intraoperative ticagrelor removal may help reduce ticagrelor-related bleeding in patients undergoing i-CABG before completing the 3-day washout. High risk emergency procedures within the first 24 hours of last ticagrelor dose have an increased bleeding risk.

Background: Atrial fibrillation (AF) commonly coexists with coronary artery disease (CAD), which significantly increases the risk of major adverse cardiovascular events. Accurate cardiovascular disease risk assessment is crucial for the management of AF patients. While coronary computed tomography angiography (CCTA) is typically not used in AF patients due to the difficulty in assessing coronary anatomy, advancements in imaging technology have improved its diagnostic accuracy.

Objectives: This study aims to compare the efficacy of two widely used risk stratification models, the 2016 NICE guidelines and the 2019 ESC guidelines, for identifying CAD in patients with AF.

Methods: We conducted a retrospective study of 739 patients diagnosed with AF and suspected CAD who were scheduled for radiofrequency ablation at the Department of Cardiology, Beijing Chaoyang Hospital, between January 2013 and December 2023. The study included only those who underwent CCTA, and excluded patients with prior coronary revascularization, pacemaker implantation, or incomplete clinical data. We assessed the risk of CAD using the 2016 NICE and 2019 ESC guidelines, focusing on pre-test probability (PTP), clinical factors, and coronary calcium scores.

Results: Among the 739 patients, 29.4% had obstructive CAD based on CCTA. The study

found that patients classified as high-risk according to both guidelines had a significantly higher incidence of obstructive CAD. The ESC guideline demonstrated superior reclassification performance, with an overall net reclassification improvement (NRI) of 44.73% compared to the NICE guideline ($p < 0.05$). The final analysis identified smoking, hypertension, and coronary calcium scores as independent predictors of obstructive CAD.

Conclusions: Both the 2016 NICE and 2019 ESC guidelines are useful for risk stratification in AF patients. However, the 2019 ESC guideline provides a more accurate reclassification of risk, offering enhanced diagnostic utility in identifying CAD. Further validation of these strategies in larger cohorts of AF patients is warranted.

ROUTE OF CARDIOPLEGIA AND OUTCOME OF PATIENTS UNDERGOING CABG WITHIN 48HOURS AFTER ACUTE MYOCARDIAL INFARCTION

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Background: While cardioplegia remains the cornerstone of intraoperative cardioprotection, it is not known whether different forms of administration of cardioplegia have an influence on the occurrence of complications and the survival of patients who underwent CABG after acute myocardial infarction. Here, we investigated the trend in choice of cardioplegia route and clinical outcome of patients undergoing CABG within 48 hours after acute myocardial infarction.

Methods: A total of 1427 patients underwent CABG within 48 hours of being diagnosed with acute myocardial infarction between 01/2001 and 12/2020. Of these patients, 891 (64.6%) received antegrade application of cardioplegia (group A), 489 (35.4%) received antegrade followed by retrograde applied cardioplegia (group B). In all cases, cold Buckberg solution was used. Retrospective data analysis was performed.

Results: Patients in group B showed the highest perioperative risk profile, with a EuroScore II of 7.68 compared with 4.35 in the antegrade group (p<0.01). More patients with antegrade followed retrograde applied cardioplegia had a severely reduced left ventricular function pre-operatively (88 (19.1%) vs 60 (7.2%); p<0.01), were diagnosed with STEMI (257 (52.8%) vs 324 (36.5%); p<0.01), presented with cardiogenic shock (144 (29.5%) vs 105 (11.8%); p<0.01) and had to be resuscitated (9 (18.6%) vs 77 (8.6 %) ;p<0.01). Patients in group B also had undergone PCI within 48 hours before CABG more frequently (103 (21.1%) vs 136 (15.3%); p<0.01). Procedure duration (p<0.01), bypass time (p<0.01) and cross-clamp time (p<0.01) were all significantly longer in group B. While the rate of complete revascularization did not differ between the groups, more patients with antegrade followed by retrograde cardioplegia application received only venous grafts (80 (16.4%) vs 58 (6.5%); p<0.01). Postoperatively patients in group B suffered more often from complications, including the occurrence of cardiac lowoutput (38 (7.8%) vs 29 (3.7%); p<0.01), stroke (29 (3.3%) vs 30 (6.3%); p<0.01), renal replacement treatment (99 (20.8%) vs 77 (8.7%); p<0.01) and increased transfusion rates (246 (52.1%) vs 363 (41.3%; p<0.01). 30-day mortality was also higher in group B (97 (19.9%) vs 62 (7.1%); p<0.01). Mortality remained significantly decreased over a 15 year observation period (p<0.01).

Conclusions: Our data implicate that antegrade in combination with retrograde cardioplegia application was mostly used in patients that were perceived as particularly vulnerable to any additional cardiac ischemia during CABG. However, further trials are needed to answer the question whether this concept could improve the outcome of high-risk patients with acute acute myocardial infarction undergoing CABG.

CARDIAC ADVANCED LIFE SUPPORT PROTOCOL: WILL ADHERANCE IMPROVE SURVIVAL?

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Background: Implementation of cardiac advanced life support (CALS) into clinical practice is associated with improved survival in patients experiencing post-operative cardiac arrest (POCA). Mortality after POCA varies between 30% and 80% and depends on timeliness and quality of CALS. This study analysed the timeline and efficiency of CALS in a single cardiac centre in the United Kingdom.

Methods: The sample included post-operative adult cardiac surgical patients who developed POCA and underwent CALS during their stay in the hospital. A quantitative primary research design was employed utilising secondary data collected retrospectively from the hospital clinical information system.

Results: Between April 2021 and September 2023, two thousand one hundred and two (2,102) cardiac surgical procedures were performed in our centre. Thirty-two patients (1.52%) developed POCA and underwent CALS. Twenty-two (68.75%) were male, and the mean age of patients was 66+/-12.4 years. Of 32, in 6 patients (18.75%) return of spontaneous circulation (ROSC) was achieved by defibrillation without need for resternotomy, whereas twenty-six patients (81.25%) had to undergo emergency resternotomy. Fourteen patients (43.75%) died despite the full CALS protocol.

In nineteen patients (59.38%), POCA occurred in the first 24 hours after operation, in nine patients (28.12%) on day 1-3, and in four patients (12.5%) POCA occurred on post-operative day 4-10.

In three (9.38%) cardiac arrests, CALS was initiated within first 5 minutes, in seven (21.88%) cases CALS was provided between 5 and 10 minutes, while in nine (28.12%) cases CALS was conducted within 10-30 minutes. Unexpectedly, in thirteen (40.63%) cases of POCA, no timeline was recorded during the emergency resternotomy.

Immediate survival of patients experiencing POCA after cardiac surgery in our series was 56.25%, followed by reduced survival at discharge to 40.63%, and survival at six months post discharge was 25% (8 patients). Of eight long-term survivors, only two patients (6.25%) made a full recovery, and their CALS protocol was initiated within the first 5 minutes after POCA.

Conclusions: Adherence to CALS protocol improves survival and long-term recovery patients experiencing POCA. To achieve the required timeline, a regular training on CALS intervention is needed in the units caring for cardiac surgical patients.

PRIMARY RESULTS HYPOTHESIZING SUPERIORITY OF ASYMMETRICAL HFNCO VS STANDARD HFNCO STUDY ON CARDIAC SURGICAL PATIENTS. SHOULD WE EXPECT SOMETHING SPECTACULAR?

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Background-Aim: A prospective, randomized, controlled study was conducted regarding Asymmetric Nasal Cannula High Flow Oxygenation (HFNCO, Asymmetric group) versus Conventional HFNCO (Conventional group) and versus Standard Oxygen Treatment (SOT, Venturi mask, Control group) post extubation on cardiac surgical patients. The study was conducted on the grounds of a worldwide acknowledged success of HFNCO treatment in respiratory failure post cardiac surgery

Methods: Asymmetric HFNCO is applied with left nasal prong diameter greater than right nasal prong. We hypothesized that Asymmetric HFNCO might be more effective than Conventional HFNCO. A novel weaning algorithm was applied in regard to measuring the outcomes of avoidance of failure on HFNCO and successful weaning of oxygenation support. Failure of treatment was defined as any escalation of treatment not reversed to baseline settings within 48h. Successful treatment was defined as weaning HFNCO (Asymmetric or Conventional) to Venturi mask. Crossover was taking place as long as baseline treatment of any group could not optimize the patient's oxygenation. Abort of treatment would take place when no treatment escalation could be reversed and the patient would deteriorate permanently.

Results: In the Asymmetrical group 18 out of 21 patients were weaned off successfully to SOT. 3 had treatment failure, and 2 aborted treatment. In the Conventional group, 12 out of 18 patients were weaned off successfully to SOT, 3 patients were crossed over to Asymmetrical group, 2 patients had treatment failure and 1 patient aborted treatment. Of 29 Control group patients, 11 and 11 were crossed over to the Asymmetrical and Conventional

group, respectively, and 7 patients were successfully managed with SOT.

Conclusions: These preliminary study findings support the feasibility, safety and non-inferiority of Asymmetric HFNCO as compared to Conventional HFNCO and SOT as regards successful weaning from oxygenation support. A novel weaning algorithm on oxygenation settings facilitated Asymmetric HFNCO regarding a faster patient's release from toxic fiO2 levels.

DOES NoL MONITORING AFFECT OPIOID CONSUMPTION DURING OFF-PUMP CORONARY ARTERY BYPASS ?

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Background - Aim: The Pain Monitoring Device (PMD) monitor uses the Nociception Level (NOL) index, a multiple parameter-derived index that has recently shown a good sensitivity and specificity to detect noxious stimuli. The aim of this study was to explore the use of the Nociception Level (NOL) index for pain assessment during off-pump coronary artery bypass.

Methods: After obtaining the Institutional Ethics Committee approval and informed written consent from patients, this prospective, randomized study was performed over 42 patients of 58-78 years old hemodynamically stable with normal or moderately impaired left ventricular function ejection fraction >40% that underwent elective off-pump coronary artery bypass for single vessel under total intravenous anesthesia on mechanical ventilation. These were randomised allocated to group 1 (Standard group n = 18), remifentanil was managed according to standard practice and group 2 (n = 24) received general anesthesia with NOL index-directed remifentanil dosing . All patients were maintained at the same depth of anaesthesia. The NOL index variations were acompared with heart rate (HR), mean arterial pressure (MAP), and Bispectral Index™ (BIS). Perioperative changes in heart rate, systolic and diastolic blood pressure, pain score, and requirement of analgesics, beta blockers, fentanyl, propofol, and inotropes were recorded, as well time to extubation and intensive care unit stay

Results:We noticed a significant difference in variation of remifentanil administration (p = 0.033). Propofol consumption was not different between the groups. Postoperative pain scores were low in both groups. There was no difference in morphine consumption 24 h after surgery.

Conclusions: NOL index reduced intraoperative remifentanil and 24h postoperative morphine consumption. It also hastened the extubation and liberation from vasopressor support and improved postoperative analgesia**.**

Thursday May 15,2025
Conference Room 2
16.40 - 17.40

EFFECT OF PERIOPERATIVE CARDIAC DAMAGE ON LONG-TERM CARDIAC EVENTS AMONG PATIENTS UNDERGOING CAROTID ENDARTERECTOMY - 12-YEAR FOLLOW-UP OF A FORMER PROSPECTIVE STUDY

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Background-Aim: There is increasing data in literature associating perioperative cardiac damage among patients undergoing carotid endarterectomy (CEA) with early or late cardiac morbidity and mortality. Aim of this study is to present the 12-year follow-up of a former prospective clinical study.

Methods: The present study evaluates the long-term results of a former prospective comparative study conducted from 2007 to 2013. Patients undergoing CEA for symptomatic or asymptomatic carotid stenosis were included. The Vascular Study Group of New England Cardiac Risk Index (VSG-CRI) criteria for stratifying patients considered for vascular surgery into low, medium, and high cardiac risk groups were used. For all patients, cTnI value assessments were made before surgery and on postoperative days 1, 3, and 7. Cardiac damage was defined as either myocardial ischemia (MIsch) (cTnI=0.05-0.5ng/mL) or infarction (cTnI>0.5ng/mL plus ECG changes or symptoms). Long-term outcomes included myocardial infarction (MIn), cardiac revascularization and cardiac mortality within follow-up that included phone communication and recording of outcomes.

Results: In total, 324 patients were originally included in the former study (Low cardiac risk [n=140], Medium cardiac risk [n=160] and High cardiac risk [n=24]). After a mean of 12+/-4 years of follow-up, only 78.7% of patients (n=255) could be contacted and were included in the present study (Low cardiac risk [n=112], Medium cardiac risk [n=123] and High cardiac risk [n=20]). Perioperative cardiac damage was observed in 32 of 255 patients (12.5%). During follow-up, there were 35 (13.7%) MIn, 42 (16.7%) cardiac revascularizations, and 13 (5.1%) cardiac deaths in total. In the long-term, the high-risk group presented more MIn, revascularizations and cardiac deaths than medium and low-risk patients. Medium-risk group showed a higher rate of MIn and revascularizations compared to low-risk group but cardiac deaths were similar. Perioperative cardiac damage was associated with increased risk for MIn (OR=57.818; 95%CI [21.189-157.765], P<0.0001), cardiac revascularizations (OR=26.062; 95% CI [20.154-155.951]; P<0.0001) and cardiac deaths (OR=21.424; 95% CI [6.115-75.035], P<0.0001) in the long-term.

Conclusions: Perioperative cardiac damage after CEA is associated with long-term cardiac morbidity and mortality. Medium and High cardiac risk patients undergoing CEA showed a higher risk for long-term cardiac events compared to low cardiac risk patients.

COMBINED EFFECTS OF HYPERTENSION AND HEART RATE ON THE RISK OF INCIDENT STROKE AMONG MONGOLIAN, CHINA

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Background: This study prospectively investigated the joint effects of hypertension and heart rate on the risk of stroke among Mongolian, China.

Methods: A cohort study of 2589 Mongolian people was conducted from 2002 to 2012 in 32 villages in Tongliao City of Inner Mongolia, China. Baseline data were collected, and blood pressure, body weight, height, heart rate, and waist circumference were measured, the participants were followed up and study outcome was defined as incident stroke during following up. Heart rate was grouped comparing heart rate≥80 bpm to heart rate <80 bpm. According to the hypertensive status and heart rate, the participants were divided into following groups: normotensives/heart rate<80 bpm, normotensives/heart rate≥80 bpm, hypertensives/heart rate<80 bpm, and hypertensives/heart rate≥80 bpm. Hazard ratios (HRs) and 95% confidence intervals (CIs) for incident stroke were calculated by Cox proportional hazard models. The discriminatory value of hypertension/heart rate on stroke was assessed by computing the area under receiver operating characteristic (AUC) curves.

Results: During the 9.2 years of follow-up, a total of 124 stroke patients occurred, the cumulative incidence rate was 4.79%. After multivariable adjustment, compared with the normotensives with a heart rate <80 bpm, the HRs of incident stroke were 3.19(95% CI 1.80-5.66; *P*<0.001) for hypertensives with a heart rate <80 bpm, 1.77 (95%CI 0.84-3.74; *P>0.05*) for normotensives with a heart rate ≥80 bpm and 3.84 (95% CI 1.95-6.24; *P*<0.001) for hypertensives with a heart rate ≥80 bpm, respectively. The hypertensives with a heart rate ≥80 bpm had the highest risk of stroke. The AUC for the model including hypertension and heart rate ≥80 bpm and other conventional risk factors was larger than that for the model including only other conventional risk factors (0.854 vs 0.836, *P*=0.023).

Conclusions: This study showed that hypertensives with high heart rate had the highest risk of stroke among inner Mongolians in China. Our findings suggested that the coexistence of hypertension and high heart rate may be a valuable predictor of stroke incidence.

ASSOCIATION OF COMBINED HYPERTENSION AND HIGH LIPID ACCUMULATION PRODUCT WITH THE RISK OF INCIDENT STROKE AMONG MONGOLIAN, CHINA

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Background: This prospectively assess the joint effects of hypertension and LAP on the risk of incident stroke among Mongolian population in China.

Methods: A cohort of 2589 Mongolians in 32 villages in Tongliao City, Inner Mongolia, China was investigated from 2003 to 2012. Data on cardiovascular risk factors were collected, blood pressure and waist circumference (WC) were measured, and blood lipid indicators including triglycerides (TG) were tested. The study outcome was defined as incident stroke. Lipid accumulation product (LAP) was calculated by WC and TG concentration, LAP for men = [WC (cm)−65]×[TG concentration (mmol/L)], LAP for women = [WC (cm)−58]×[TG concentration (mmol/L)]. High LAP was defined as LAP ≥16.83 (median). According to the hypertensive status and LAP, the participants were divided into following groups: normotensives/low LAP, normotensives/high LAP, hypertensives/low LAP, and hypertensives/high LAP. Hazard ratios (HRs) and 95% confidence intervals (CIs) for incident stroke were calculated by Cox proportional hazard models.

Results: During the follow-up, a total of 124 stroke patients occurred among 2589 Mongolians. The participants with higher LAP were associated with increased risk of incident stroke (HR, 1.26; 95% CI, 1.02-2.39) compared with those with lower LAP. Coexistence of hypertension and high LAP significantly increased risk of incident stroke. After adjusting for other cardiovascular risk factors, compared to normotensives with low LAP, adjusted HRs (95% CIs) for normotensives with high LAP, hypertensives with low LAP and hypertensives with high LAP were 1.78(0.82-3.83), 2.96 (1.52-5.78) and 4.10 (2.08-8.08), respectively. The hypertensives with high LAP had the highest risk of incident stroke.

Conclusions: This study showed that hypertension and high LAP were associated with incidence of stroke, independently of other traditional risk factors. Hypertensives with high LAP had the highest risk of stroke among inner Mongolians.

CAROTID ARTERY ANGIOPLASTY AND STENTING: A 15-YEAR EXPERIENCE

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Purpose: The aim of this study is to present our 15-year experience (2009-2024) with carotid artery angioplasty and stenting (CAS) and document the evolution of this technique over the specified period.

Materials and Methods: We retrospectively analyzed data from 394 patients (278 males; mean age 69 years) who underwent CAS. Of these, 254 (64.5%) were symptomatic, and 201 (51%) had left-sided lesions. All patients were treated with self-expanding stents and distal filter-type cerebral protection devices. Access was achieved via the femoral artery in all cases except one, which required access through the right brachial artery. Conversion to open carotid endarterectomy was performed in 3 patients due to technical difficulties (anatomical variations, challenging catheterization).

Results: In this patient cohort, perioperative stroke occurred in 5 patients (1.3%). Bradycardia was observed in 68 patients (16%), while hypotension occurred in 57 patients (14.5%). No deaths were reported within the first 30 days post-procedure. None of the prognostic risk factors tested proved to be statistically significant for peri-procedural stroke.

Conclusion: Our results demonstrate that CAS can be performed with low stroke/death rates. Comparing to our previously published experience, there is a shift nowadays to offer CAS in more symptomatic than asymptomatic patients (65% vs 35% in the period 2009-2024; and 35% vs 65% in the period 1997-2007). Increasing expertise in patient selection, appropriate device utilization, and execution of the endovascular technique is critical for minimizing adverse periprocedural events.

CLINICAL AND LONG-TERM 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 (CCO) remains controversial. The aim of the present study was to inverstigate the influence of CCO on the clinical and long-term outcomes after carotid artery endarterectomy.

Methods: In this retrospective, single-center study includes 340 consecutive patients submitted to carotid surgery between October 2011 and November 2017. The operative technique consisted of the carotid endarterectomy with bovine pericardium patch closure under general anesthesia with perioperative cerebral monitoring und selective use of intraoperative shunt placement. 41 patients CCO were mached with 82 patients without significant stenosis of contralateral carotid artery.

The primary clinical outcome measures included ipsilateral stroke, ipsilateral transient ischemic attack (TIA), myocardial infarction (MI), mortality within 30 days and the need for a shunt placement intraoperatively. The secondary clinical outcome measures included stroke, TIA, MI, mortality and restenosis in the long-term follow-up.

Results: Due to matching, there were no significant differences regarding patients' demographics or cardiovascular comorbidity. At 30 days there were 3 patients with ipsilateral stroke, all in the non-CCO group (p = 0.22). 4 Patients presented with bleeding with the need for redo surgery: 1 in the CCO group and 3 in the non-CCO group (p = 0.72). At the end of the follow-up period no new patients presented with an ipspilateral stroke. The incidence of restenosis was 4.8% in the CCO group *versus* 3.7% in the non-CCO group (p = 0.74).

Conclusions: Carotid endarterectomy in presence of CCO under selective use of intraoperative shunt placement appears to be a safe procedure without influence on the clinical and long-term outcomes. CCO should not considered always as a high-risk factor for operation.

INTERVENTION FOR NEAR TOTAL OCCLUSION OF THE INTERNAL CAROTID ARTERY. A SINGLE CENTER EXPERIENCE

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Introduction: Recent guidelines recommend best medical treatment for the treatment of carotid near total occlusion (CNO), while the role of intervention with carotid endarterectomy (CEA) or stenting (CAS) remains controversial. The present study investigates our 16-year experience in the treatment of CNO with carotid intervention.

Methods: Single center retrospective study including patients treated with carotid intervention (patch or eversion CEA and CAS) from 2006-2025. Demographics, treatment details, and outcomes such as mortality, myocardial infarction (MI), stroke, intra-cerebral hemorrhage (ICH) were analyzed for the early period (30-day post-operation), while stroke, restenosis and death were also analyzed.

Results: From a total of 800 patients treated with carotid interventions, 36 were treated for CNO (CEA: 27 patch, 6 eversion and 3 with CAS). The mean patients' age was 72.2±9 (90% males). Almost half of the patients were symptomatic (47%; 17/36). The intra-operative stroke rate was 0% for asymptomatic patients and 5.88% (1/17) in symptomatic ones. The mean total hospital stay was 3.8±2. During 30-day period, intracerebral hemorrhage occurred in 5,26% in asymptomatic and in 5.88% in symptomatic patients and all within the first 7 days associated with development of hypertension. No MI or death occurred during early period. During mean follow up of 32±30 months, the survival rate was 95%, 87% and 58% at 12, 24, and 72 months, respectively. No patient experienced late stroke or significant (>50%) restenosis.

Conclusion: Perioperative risk of stroke and death in patients with CNO remains within the range of other symptomatic and asymptomatic patients with high grade stenosis. However, early postoperative intracerebral hemorrhage associated with hypertension remains high and therefore in such patients intense blood pressure control is of paramount importance.

Thursday May 15,2025
Conference Room 1
18.00 - 19.30

IMPELLA 5.0/5.5 - RETROSPECTIVE REVIEW OF INSERTION AND MECHANICAL CIRCULATORY SUPPORT VIA AXILLARY ARTERY GRAFT

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NorthShore University Hospital

Background-Aim: Impella 5.0/5.5 is a powerful mechanical cardiac/circulatory support device. We examined our results with surgical implantation of Impella 5.0/5.5 via the axillary artery approach.

Methods: The study was conducted as a retrospective review of a single institution experience. All consecutive patients undergoing attempted surgical implantation of an Impella 5.0/5.5 mechanical support device are reported in the study. A prospectively maintained database was analyzed for patient demographics, procedural details, outcomes and complications.

Results: A total of 52 patients were identified over a period of 6 years as having undergone attempted axillary 5.0/5.5 insertion, with 36.5% (19/52) occurring in the past year. A total 49/52 (94.2%) were successful. Three of 52 (5.8%) cases were aborted, 2 (3.8%) due to small vessel size (in both cases an axillary Impella CP was implanted as the next best option), and one (1.9%) due to problems with the Impella pump. There were 45/52 (86.5%) male patients. Mean age was 61.2 years (range 18-84). Indications for support were as follows: acute myocardial infarction with cardiogenic shock 27/52 (52.0%), cardiomyopathy 15 (28.8%), postcardiotomy cardiogenic shock 3 (5.8%), support for off-pump coronary artery bypass grafting 1 (1.9%), support for high-risk percutaneous coronary intervention 1 (1.9%), and “other” 3 (5.7%).

Of the 49 successful implants, 22/49 (44.9%) were Impella 5.0 and 27/49 (55.1%) were Impella 5.0 corresponding to device availability. Mean and median duration of support were 281.6 and 202.7 (range 0.2-1,340.1) hours respectively. Successful explants occurred in 39/49 (79.6%) patients, 9/49 (18.4%) were withdrawn form care, and 1/49 (2.0%) has unknown follow up (after transfer). Of the 39 successful explants 21/39 (53.8%) were successfully weaned to recovery, 15/39 (38.5%) bridged to left ventricular device support, 2/39 (5.1%) bridged to transplant, and 1/39 (2.6%) explanted at the end of (high-risk PCI cath lab procedure) procedure.

Notable complications included small vessel size 4/52 (7.7%), anoxic brain injury 1/52 (1.9%), multiple seizures 1/52 (1.9%), Impella pump issues 1/52 (1.9%), device clot entrapment 1/52 (1.9%), and pericardial window 1/52 (1.9%).

Conclusions: Surgical implantation of Impella 5.0/5.5 via an axillary artery graft offers strong, reliable mechanical circulatory support with a reasonable risk profile in critically ill patients. More than half of the successful explants were bridged to recovery with no additional interventions required.

CARDIAC CATHETERIZATION COMPLICATION. RADIAL ARTERY INTIMA EMBOLISM IN POSTERIOR CEREBRAL ARTERY

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Interventional Radiology

Background: Ischemic stroke is a rare complication of cardiac catheterization. It occurs in 0.05-0.1% of cases and associated with negative prognosis. In most cases it is iatrogenic and associated with atherosclerotic disease of aorta but unexpected causes of emboli also can be detected.

Case report: A 67 years old female was admitted to cardiac catheterization due to high grade ischemic heart disease. Patient had an atrial fibrillation and ejection fraction was normal. An ischemic stroke was registered 4 years ago with complete neurological recovery. Ultrasound examination have showed left internal carotid artery (ICA) extracranial occlusion. Right radial approach with 5F introducer was obtained. Severe spasm of radial artery was noticed. Guidewire 0'014 was used to pass through spasm. Pain in hand was treated by narcotic analgesics and additional local anesthesia. Left carotid stroke symptoms (aphasia, right hemiparesis, face asymmetry) were registered 20 minutes after. Computer tomographic angiography registered left ICA occlusion in extracranial part and left posterior cerebral artery (PCA) occlusion in P1 segment. Patient was referred to urgent thrombectomy. Invasive angiography confirmed CT findings (pic. 1). Thrombaspiration was performed from PCA with full restoration of blood flow through posterior communicate artery to left middle cerebral artery area (pic. 2). Visually the intima of radial artery was detected in the aspirated material (pic. 2). Patient was discharged with complete neurological recovery.

CORONARY INSTENT RESTENOSIS: ACTUAL SURGICAL STRATEGY

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Introduction: Nowadays stenting is the procedure of choice for coronary stenosis , but there is the risk of in-stent restenosis in a significant number of cases (15-45%). In-stent restenosis is an important clinical problem and those patients are a challenging group for both interventional cardiologists and cardiac surgeons as generally they are patients with aggressive coronary atherosclerosis .

In-stent restenosis is mainly caused by intimal hyperplasia and sometimes by stent elastic recoil. There is consistent evidence that the percutaneous retreatment of these cases leads to suboptimal clinical results and is associated with high risk of additional restenosis or occlusion.

Because of the increasing use of multiple stents in diffuse and distal lesions of coronary arteries, the surgeon should use special and difficult techniques in order to perform coronary revascularization.

Material and methods: On a one year period (01.01. 2015 and 31.12.2015) on a series of 375 patients operated for isolated CABG in our institution,27.% have previous one or multiple site stented, included left main disease. The number of pontages were 2,8/pac, all patients received LIMA on LAD The myocardial protection was St.Thomas II/ blood cardioplegia(1/4) administrated antero and retrograde via coronary synus.The mean clamping time was 75 min and ECC 95 min. Triple wessel disese was in 82% of cases and left main 16,7%. The perioperative morbi-mortality rate was 5,6% in comparison with CABG per first intention (2,5%).

Discussions: CABG has better outcome in patients with ISR rather than the use of interventional methods. After successful PTCA, operative risk for surgery does not increase as long as the coronary bed and the ventricular function are not deteriorated. Surgical technique is not modified due to the previous PTCA. Most of the patients who will need surgery after PTCA will be operated during the first year. Rapid evolution of the coronary artery disease seems to be as important as restenosis in determining patients who will require surgery.

Conclusion: This study concludes that a history of multiple previous PTCA increases in-hospital mortality and the incidence of major adverse cardiac events.

DIRECT MYOCARDIAL ADMINISTRATION OF ADENOSINE FOR CARDIOPROTECTION

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Introduction: Myocardial injury following cardiac surgery is a significant concern, often assessed by postoperative troponin levels. Adenosine has been investigated for its cardioprotective properties, including its potential to reduce ischemia-reperfusion injury. This study explores the impact of adenosine administration immediately after aortic closure on troponin levels 24 hours postoperatively.

Aim: The aim of this study is to evaluate whether adenosine administration reduces myocardial injury, as reflected by troponin elevation, in patients undergoing cardiac surgery.

Methods: A prospective observational study was conducted, where adenosine was administered immediately after aortic closure, directly to the heart. Patient data, including troponin levels at 24 hours post-surgery, were collected and analyzed. Statistical comparisons were made between patients who received adenosine and those who did not, to determine its effect on myocardial injury.

Results: Forty-eight patients (10 women) enrolled in our pilotic study. The majority of patients undergone CABG (n=29, 60,41%) and 19 (39,59%) patients undergone Aortic or Mitral Valve Replacement (AVR, MVR). Patients divided equally to two groups according to adenosine administration (20 patients per group). Mean age of adenosine group was 68,77±9,19 years and mean age of control group was 67,85±10,73 years. Aortic cross clump time (ACC) was 73±33 minutes (ACC) and cardiopulmonary bypass time (CBP) was 96±36 minutes for adenosine group. Accordingly, ACC time was 82±32 minutes and CBPT time was 112±36 minutes for control group. The bivariate analysis revealed that patients who received adenosine exhibited lower troponin levels 24 hours postoperatively compared to those who did not receive the drug [Median Value (25th-75th percentile): control group, 7.572 (3.42-17.22 ng/L) vs adenosine group, 2.318 ng/L (1609-6152 ng/L), p=0,020]. This suggests a potential cardioprotective effect of adenosine in reducing myocardial injury.

Conclusion: While earlier research investigated adenosine via peripheral administration, our study focused on intraoperative administration directly to the myocardium following aortic declamping. Our method may play a role in myocardial protection by limiting postoperative troponin elevation. Further research with larger sample sizes is recommended to confirm these findings and optimize its clinical application.

SIMULTANEOUS INTERVENTIONS IN MULTIFOCAL ATHEROSCLEROSIS INVOLVING CORONARY ARTERIES AND LOWER LIMB ARTERIES

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Background. The combination of coronary artery disease and peripheral artery disease is associated with almost doubling of all-cause mortality, to 4.6% per year, compared to mortality of each disease alone. When performing the first stage of intervention on lower limbs arteries, there is a high probability of getting a perioperative myocardial infarction in 4.9% of patients and performing an isolated coronary bypass can increase the lower extremities ischemia, up to the loss of limb in 7.9%. Remains unresolved: what should be the order and sequence of surgical interventions in multifocal atherosclerosis, are simultaneous interventions possible?

The aim. To study the possibilities and effectiveness of simultaneous interventions in patients with multifocal atherosclerosis, with coronary arteries damage and lower extremities' arteries.

Methods. The results of treatment of 84 patients with combined lesions of coronary arteries and lower extremities' arteries from 2016 to 2024 were analyzed. Coronary bypass operations were performed using the off-pump technique. During simultaneous interventions, coronary bypass surgery was always prioritized. Interventions on lower extremities were performed with coronary bypass surgery both simultaneously (n=38, 45%) and in stages (n=46, 55%). In staged interventions group, 2 sub-groups were indicated - performance of the first stage of coronary bypass followed by revascularization of lower extremities (n=28, 33%), or performance of the first stage of reconstruction of lower extremities' arteries with subsequent coronary bypass (n=18, 22%). The primary end points for evaluating simultaneous interventions were major adverse cardiac events and pain as an indicator of increased ischemia of lower extremities due to staggered staged interventions.

Results. Both group deaths were not detected. Simultaneously operated patients' major adverse cardiac events were not detected. In staged interventions group, where coronary bypass was primarily performed in 5 patients (18%), increased ischemia of lower extremities' presence was noted, which required emergency intervention on the arteries of lower extremities. In case of staged interventions, in which the first stage was revascularization of lower extremities, before coronary bypass surgery, an acute myocardial infarction in the early postoperative period developed for 4 patients (22%). Performing delayed interventions involves a considerable number of risks and complications, which significantly outweigh those that can occur with simultaneous interventions.

Conclusions. Performing simultaneous interventions in multifocal atherosclerosis with coronary arteries and lower extremities' arteries damages with appropriate indications is safe and effective method of treatment for this group of patients.

ANALYSIS OF SURGICAL MODALITIES FOR CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH REDUCED LEFT VENTRICULAR FUNCTION AND PERIOPERATIVE LEVOSIMENDAN CONDITIONING

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Background-Aim: Off-pump coronary artery bypass grafting (OPCAB) is favored for patients with impaired left ventricular (LV) function requiring coronary artery bypass grafting (CABG). Perioperative use of Levosimendan, a calcium sensitizer, is proposed to prevent post cardiotomy cardiogenic shock. However, the impact of CABG modality and urgency in patients with reduced LV ejection fraction (LVEF ≤35%) and Levosimendan treatment remains underexplored.

Methods: We retrospectively analyzed patients with LVEF ≤35% undergoing isolated CABG with pre- or intraoperative Levosimendan treatment between February 2018 and September 2023, excluding salvage cases (n=76). Patients received either on-pump arrest CABG (ONCAB, n=20), on-pump beating heart CABG (ONBHCAB, n=41), or OPCAB (n=15). Clinical outcomes were compared across CABG modalities and analyzed by surgical urgency (elective, n=33; urgent/emergent, n=43).

Results: In the overall cohort (LVEF 26.6±5.6%), in-hospital mortality (IHM) and major adverse cardiac events (MACE) were similar across CABG modalities (IHM n=6, 7.9%; p=0.65; MACE n=14, 18.4%, p=0.44). In elective CABG (preoperative CK-MB 19.6±5.5 U/l, Euroscore II 3.5±2.6%), direct postoperative and maximal CK-MB levels were lower in OPCAB cases (OPCAB vs. ONCAB vs. ONBHCAB; postop: 21.8±11.2 U/l vs. 48.8±25.1 U/l vs. 58.1±27.5 U/l, p<0.001; max: 25.9±14.8 U/l vs. 58.4±21.2 U/l vs. 66.6±42.2 U/l, p<0.001). IHM, prevalence of MACE, and temporary mechanical cardiac support (tMCS) were similar across modalities (IHM n=1, 3%, p=0.54; MACE n=4, 12.1%, p=0.58; tMCS n=2, 6.1%, p=0.37). Early LV remodeling, defined as significant LVEF recovery at discharge, was observed only after OPCAB and ONBHCAB (pre- vs. postop LVEF: OPCAB 26.8±2.9% vs. 37.6±7.9%, p=0.006; ONBHCAB 25.2±6.3% vs. 32.3±5.8%, p=0.009). In the urgent/emergent cohort (preoperative CK-MB 72.5±73.9 U/l, Euroscore II 4.3±3.5%), IHM was higher in OPCAB (OPCAB n=2, 66.7%; ONCAB n=1, 7.1%; ONBHCAB n=2, 7.7%, p=0.009). The overall prevalence of MACE (n=10, 23.3%) and tMCS (n=6, 14%) was elevated in this cohort.

Conclusions: In patients with LVEF ≤35% undergoing elective CABG with perioperative Levosimendan treatment, outcomes were acceptable across CABG modalities. OPCAB showed benefits in reducing postoperative CK-MB levels and achieving early LV remodeling in elective cases. However, in urgent/emergent cases, OPCAB was linked to higher IHM, suggesting a need to consider protected cardiac surgery despite pharmacological conditioning.

HIGH-SENSITIVITY I-TROPONIN AND T-TROPONIN AFTER CARDIAC SURGERY: CLINICAL IMPLICATIONS

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Background: Threshold levels of high-sensitivity troponin elevations and clinically periprocedural myocardial injury after cardiac surgery are not well established.

The aim is to analyse levels of high sensitivity I (hs-TnI) and T (hs-TnT) cardiac troponin after cardiac surgery and their association with mortality and postoperative mayor adverse cardiac events (MACE).

Methods: A consecutive cohort of 170 patients underwent major cardiac surgery by the same surgeon was retrospectively analysed with the presence of serial perioperative cardiac biomarker measurements in two periods (hs-TnI in the first 60 patients and hs-TnT in the following ones).

Blood samples were obtained for measurement of hs-TnI (upper reference limit 11 ng/L) or hs-TnT (upper reference limit 14 ng/L) at arrival to ICU and 6, 9 and 18 hours after surgery.

Predicted postoperative myocardial infarction according to enzyme levels proposed by ISCHEMIA, SCAI and EACTS Expert Consensus Statement were calculated.

Postoperative mortality and observed MACE events were analysed.

RESULTS: Postoperative I-Tn levels are significantly higher (6493 ng/L Vs 863 ng/L, p<0,001) and late (15,4 h Vs 9,1 h, p<0,001) than T-Tn levels.

Postoperative peak I-Tn exceed X590 as fold value of upper reference limit and T-Tn exceed X61 the fold value.

I-Tn levels have no difference between CABG-aortic valve surgery patients and patients who underwent other cardiac surgery (4625 ng/L Vs 8086 ng/L, p=0,07).

The same results are showed with T-Tn levels (687 ng/L Vs 1055 ng/L, p=0,12)

Overall operative mortality was 1,76%.

Two patients had an intraoperative myocardial infarction in the second period (hs-TnT), developing new wall abnormalites Both patients had postoperative peak hs-T troponin at ICU arrival. Four patients developed a new left bundle branch block without new wall abnormalites.

Conclusions: 1.Postoperative hs-TnI levels are significantly higher (x7.5) and later (+18 hours) than hs-TnT levels.

2. Threshold values for hs-TnT level proposed by ISCHEMIA and SCAI have high negative predictive value for detecting myocardial infartion after CABG or aortic valve procedures, although positive predictive value is low and other supportive signs of myocardial ischemia are needed. The cut-off value proposed by EACTS Expert Consensus probably should be lower for isolated CABG.

3. Solely rely on increased postoperative hs-Troponin is not related to operative mortality or poor outcomes in our serie.

4. The threshold values proposed might help to exclude perioperative myocardial infarction, in patients without elevations of hs-Troponin, being necessary to add other tests such as ECG or echocardiogram if troponin exceeds the threshold values.

SEQUENTIAL GRAFTING OF THE SCELETONIZED LEFT IMA TO THE LEFT CORONARY ARTERY SYSTEM

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Introduction: Sequential grafting may be an effective way to maximize the benefits of the left internal mammary artery (LIMA) conduit. Despite increasing clinical application, due to insufficient and inadequate outcome data, the strategy of sequential LIMA grafting has not been proven its superiority. The aim of this retrospective study was to evaluate the in-hospital and mid-term outcomes of sequential grafting of in situ skeletonized LIMA to the left coronary system.

Methods: In 2018-2024, 3996 patients underwent primary CABG for multivessel coronary artery disease at our institution. Skeletonized left internal mammary artery (LIMA) was systematically used as *in situ* graft to revascularize left anterior descending artery (LAD). In 276 (6.9%) patients sequential LIMA (LIMA-S) grafting was performed with diagonal branches. LIMA-S patients (n=273pts) were compared with equal number of patients were simplex LAD-LIMA grafting was performed. The incidence of postoperative MACCE, immediate (30 day) mortality rate and long-term survival were compared.

Results: There was no difference in immediate posteoperative mortality (30 days) in both groups. There was no perioperative myocardial infarction or cerebrovascular incidence as well. Mean follow-up was 3.7 ± 0.6 years with similar freedom from death.

Conclusion: LIMA-S as *in situ* grafts could be successfully used in CABG patients. IMA harvesting with sceletonized technique provides better IMA length, detailed graft visualization, and minimal trauma to the chest wall. Thus, the application of techniques for constructing the LIMA-S grafting used in this series makes traditionally accepted limitations irrelevant.

TREATMENT STRATEGIES FOR VENTRICULAR SEPTAL RUPTURE AFTER MYOCARDIAL INFARCTION

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Postinfarction ventricular septal rupture (PIVSR) is a complication with a low incidence but extremely high mortality. PIVSR can occur 1-14 days after acute myocardial infarction (AMI), with two peak time periods at 24h and 3-5 days after myocardial infarction (1-3). With the advent of the reperfusion era, the incidence of PIVSR has decreased from 1 to 3% to the current 0.2-0.5%. Although there are various treatment methods available such as cardiac assist devices, surgical procedures, and interventional closures, the mortality rate of PIVSR is still high. Studies have shown that the survival rate of PIVSR without surgery after 1 month is <10%, and that surgery can significantly improve the prognosis of these patients. Therefore, surgical treatments are necessary, but the post-surgical mortality rate is still high, and there are still many controversies about the optimum surgical timing. The American College of Cardiology Foundation/American Heart Association (ACCF/AHA) guidelines propose that patients with PIVSR should be operated immediately regardless of their hemodynamic status, but the risk of fragile myocardial tissue bleeding and residual shunt after emergency surgery is present; therefore, an increasing number of scholars believe that the timing of the operation should be delayed when the patient's condition permits. The 2017 European Heart Association (EHA) guidelines for the management of acute myocardial infarction also recommend that delayed surgical treatment be considered for patients with PIVSR and stable hemodynamic after active treatment. Percutaneous ventricular septal rupture closure, an interventional transcatheter closure (TCC) approach for PIVSR, was first reported in 1988 by Locki et al. The procedure has developed over the years to become a less invasive treatment alternative, providing a quicker and less traumatic recovery. Even if the ventricular septal rupture (VSR) cannot be completely blocked, TCC can promote hemodynamic stability and can be used as bridge therapy until later, more invasive, surgical repair can be performed. However, the determination of whether TCC or open chest surgery is the best choice for patients with PIVSR requires further research and discussion. This study systematically reviewed the treatment experience of 53 patients with PIVSR in our hospital. We applied risk factor analysis to determine the potential best treatment strategy and the choice of treatment timing to improve the poor prognosis associated with PIVSR.

SURGERY FOR POST INFARCT VENTRICULAR SEPTAL RUPTURE

Aureliu Batrinac, Andrei Ureche, Serghei Voitov, Veronica Stratan, Verginia Onofrei, Vitalie Moscalu

Medpark International Hospital, State University of Medicine and Pharmacy "Nicolae Testemitanu", Institute of Cardiology

Background-AIM. Ventricular septal rupture is a rare complication of myocardial infarction first identified by Latham in 1847. According to the Global Registry for Acute Coronary Events, ventricular septal rupture occurs with an incidence of 1% to 3% of patients with ST-segment elevation myocardial infarction in the absence of reperfusion therapy and in 0.2% to 0.34% of patients receiving fibrinolytic therapy. The prognosis depends significantly on the size and location of the tear, with more significant defects presenting a higher risk. Prompt diagnosis and immediate surgical intervention are essential for survival, as delayed treatment increases the risk of multiple failure.

Methode. The study highlights the critical role of surgery, intraoperative techniques and postoperative outcomes.

Results. The study included 37 patients operated on in the International Hospital Medpark between 2011 and 2025: 22 patients were diagnosed with anterior ventricular septal rupture and 15 patients with posterior wall rupture. 14 patients were operated on in the first 24 hours, with 4 postoperative deaths, and 23 patients were operated on between 5-17 days, with 2 postoperative deaths. Double patch repair was used as the surgical technique in 15 cases for anterior ventricular septal rupture and in 7 cases infarct exclusion. For posterior ventricular septum rupture through infarct area of posterior left ventricule - 11 double patch repair, through right ventricle 1 case and through right atrium 3 cases. Concomitant procedures were performed in 33 patients: myocardial revascularisation in 26 cases, mitral valve repair in 4 patients, mitral valve replacement in 2 cases and aortic valve replacement in 1 case. Mortality was 16.21% (6 patients). Septal repair according to our techinique using two patch from the same site shows to be a promising one.

Conclusion. The overall postoperative survival of ventricular septal rupture is 63% at 1 year, 57% at 5 years, and 50% at 10 years. Further stratification of our study demonstrated that ventricular septal rupture is a major surgical emergency with inherent postoperative risks. Rapid decision-making, continuous hemodynamic monitoring and timely surgical intervention, ultimately improves patient outcomes and reduces mortality associated with this devastating complication of myocardial infarction.

Thursday May 15,2025
Conference Room 2
18.00-19.10

POLYCYSTIN-1 AS A NOVEL BIOMARKER FOR PERIPHERAL ARTERY DISEASE: INSIGHTS FROM A PROSPECTIVE STUDY

Panagiotis Theodoridis[1], Sotirios Georgopoulos[2], Christos Bakoyannis[2], Konstantinos Davos[3], Aimilia Varela[3], Christos Dimopoulos[1], Theodosios Bisdas, Chris Klonaris[2]

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Background: Atherosclerosis remains a leading cause of morbidity and mortality worldwide. Recent studies highlight the potential role of mechanosensitive molecules, particularly Polycystin-1 (PC-1), in vascular pathology. However, its significance in carotid atherosclerosis remains largely unexplored. This study aims to evaluate PC-1 serum levels and its association with atherosclerotic plaque characteristics and the p53/p38/p21 signaling pathway.

Methods: A total of 70 patients undergoing carotid endarterectomy were included in this study. PC-1 levels in serum were measured using ELISA, while Western blot analysis was performed to assess p53/p38/p21 signaling pathway activation. Patients were stratified into symptomatic (n=17) and asymptomatic (n=53) groups. Correlations between PC-1 levels, clinical parameters, plaque characteristics, and protein expression were analyzed using Student's t-test and chi-square tests.

Results: PC-1 was detected in ten patients (7 asymptomatic, 3 symptomatic), with levels significantly correlating with age ($p<0.0001$), BMI ($p<0.0001$), lipid profile ($p<0.0001$), HbA1c ($p<0.0001$), and carotid stenosis severity ($p<0.0001$). No significant correlation was found between PC-1 levels and serum creatinine (TABLE 1). Western blot analysis revealed an increase in p21 and phospho-p38 expression in PC-1-positive samples, although this difference did not reach statistical significance. Heatmap analysis showed greater p53/p38/p21 activation in PC-1-positive samples, particularly in male patients.

Conclusion: These findings suggest that PC-1 may serve as a potential biomarker for carotid atherosclerosis, with implications for disease progression and mechano-transduction signaling. Further studies with larger cohorts are needed to validate these observations and explore the role of PC-1 as a therapeutic target in vascular disease.

IMPACT OF ISCHEMIC POSTCONDITIONING ON OUTCOMES OF EVERSION vs. CONVENTIONAL CAROTID ENDARTERECTOMY

Nenad Ilijevski, Slobodan Pesic, Jovan Petrovic, Enes Ljatifi, Aleksandra Milacic, Slobodan Tanaskovic

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Introduction: Carotid endarterectomy (CEA) is the gold standard in preventing stroke in patients with carotid artery stenosis. Comparing eversion endarterectomy (eCEA) and conventional endarterectomy with patch angioplasty using biological material (pCEA) highlights differences in clamp time duration and the impact of ischemic postconditioning (IPCT) on ischemic events and reperfusion syndromes. The aim is evaluating the clamp time duration in eCEA and pCEA, assess the impact of clamp duration on surgical outcomes, and analyze the effectiveness of IPC in reducing ischemic and reperfusion complications.

Methods: The study included 45 patients who underwent eCEA (n=30) and pCEA (n=15). Clamp duration was recorded during the procedure, and IPCT was applied to 10 patients in each group. Outcomes were evaluated by the incidence of ischemic events and reperfusion syndromes in the postoperative period.

Results: The mean clamp time was significantly shorter in eCEA compared to pCEA (19±5min vs. 30±2min, $p<0.001$). Clamp duration did not have a statistically significant impact on total neurological or surgical outcomes ($p=0.411$). There was no observed difference between patients with IPCT compared to standard surgical procedure with regards to neurological or surgical outcomes ($p=0.871$). The mean clamp time was significantly shorter in eCEA+IPCT compared to pCEA+IPCT (20±3min vs. 31±4min, $p<0.001$).

Conclusion: CEA demonstrates an advantage in terms of shorter clamp duration compared to the conventional technique with patch angioplasty. Clamp duration does not directly affect clinical outcomes, while ischemic postconditioning significantly reduces the risk of ischemic events and reperfusion syndromes, making this technique valuable in optimizing carotid surgery outcomes.

CAROTID ARTERY DISEASE -SINGLE CENTER RETROSPECTIVE STUDY-

Konstantinos Maltezos, Anastasios Papapetrou, Ilianna Doukogianni, Anna Pachi, Georgios Kastrisios, Stavros Kerasidis, Chrysostomos Maltezos
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Introduction: Carotid artery disease is one of the most common causes of ischemic stroke worldwide, and carotid endarterectomy remains an effective treatment method.

Method - Purpose: The aim of this study is to present our clinical experience with carotid artery disease over the past five years.

Results: Over the last five years, a total of 438 patients (309 men and 129 women) underwent treatment. The average patient age was 71 years. Of these, 101 patients (23%) were symptomatic.

Most symptomatic patients had a recent history of stroke (AE). The degree of stenosis in symptomatic patients ranged from 60% to 99%, while in asymptomatic patients, it ranged from 80% to 99%.

A total of 412 open carotid endarterectomies were performed, including 293 eversion endarterectomies, 115 with patch closure, 4 using grafts, and 2 primary closures. Additionally, 24 patients underwent endovascular intervention following a recurrent stenosis.

Regarding postoperative complications, three cases (0.7%) of endarterectomy site thrombosis were detected and treated surgically, as well as three cases (0.7%) of cervical hematomas that also required surgical intervention. Hyperperfusion syndrome occurred in five patients (1.1%), and there were two postoperative deaths (0.5%). Notably, 20 patients (4%) experienced postoperative voice hoarseness.

During follow-up, 25 cases (6%) of restenosis were observed. Of these, 15 were managed conservatively with monitoring, while 10 patients who had previously undergone open endarterectomy underwent repeat endarterectomy once the stenosis exceeded 90%.

Conclusion: Carotid endarterectomy remains a well-established and effective treatment for carotid artery disease. Modern endovascular techniques offer a minimally invasive alternative with high efficacy, particularly in cases of restenosis and in patients with significant comorbidities.

OUR EXPERIENCE SURGICAL TREATMENT IN PATIENTS WITH INTERNAL CAROTID ARTERY OCCLUSION AND CONTRALATERAL STENOSIS

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Background and Aim: Contralateral internal carotid artery occlusion increases the risk of ischemic complications during surgery. This study aims to compare two surgical strategies: (1) external carotid artery reconstruction before carotid endarterectomy and (2) carotid endarterectomy before external carotid artery reconstruction.

Methods: A total of 100 patients with hemodynamically significant internal carotid artery stenosis (≥70%) and contralateral internal carotid artery occlusion were randomized into two groups:

- Group 1 (n=50): External carotid artery reconstruction as the first stage, followed by carotid endarterectomy.
- Group 2 (n=50): Carotid endarterectomy first, followed by external carotid artery reconstruction.

Outcomes included intraoperative and postoperative complications, cerebral perfusion dynamics, 30-day stroke incidence, and long-term results at 12 months.

Results: 1. Intraoperative Complications:
- Transient ischemic episodes: 8% (Group 1) vs. 14% (Group 2).
- Temporary hypoperfusion: 6% (Group 1) vs. 12% (Group 2, $p<0.05$).
- Hypertensive responses: 18% (Group 1) vs. 22% (Group 2, $p>0.05$).

2. Postoperative (30-day) Outcomes:
- Stroke incidence: 8% (Group 1) vs. 12% (Group 2, $p=0.07$).
- Restenosis (>50%): 0% in both groups.
- Coronary complications: 4% (Group 1) vs. 6% (Group 2).
- Wound hematomas: 4% in both groups.

3. Cerebral Perfusion:
- 24-hour postoperative blood flow increase: +23% (Group 1) vs. +18% (Group 2).
- By day 7: +27% (Group 1) vs. +25% (Group 2).
- Early postoperative hypoperfusion: 6% (Group 1) vs. 12% (Group 2).

4. Long-Term (6-12 months) Results:
- Restenosis (>50%): 8% (Group 1) vs. 4% (Group 2, $p<0.05$).
- Recurrent ischemic events: 4% (Group 1) vs. 6% (Group 2).
- Cognitive improvement: 32% (Group 1) vs. 38% (Group 2).
- Mortality rate: 2% in both groups.

Conclusions: 1. Staged surgery with initial external carotid artery reconstruction improves early cerebral perfusion and reduces intraoperative ischemic episodes.

2. Primary carotid endarterectomy reduces the risk of long-term restenosis, which may be beneficial for patients with progressive atherosclerosis.
3. Both strategies demonstrate comparable complication rates, emphasizing the need for individualized surgical planning.

POTENTIAL OF ULTRA-HIGH HYDROSTATIC PRESSURE-TREATED AUTOLOGOUS SKIN AS A VASCULAR PATCH: A PILOT ANIMAL STUDY

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Background and Aim: An ideal vascular graft requires high biocompatibility, antithrombogenicity, and growth potential. We have been conducting research on an *in vivo* tissue engineering approach in which a foreign material (e.g., silicone) is implanted subcutaneously, allowing the host tissue response to form a connective tissue membrane that can be used as a vascular patch. This technique was first applied in pediatric cardiac surgery in 2014, and even after more than 10 years, its outcomes remain favorable.

However, tissue maturation requires approximately two months, making it unsuitable for emergency procedures. Furthermore, patients with low regenerative capacity (e.g., neonates, elderly, diabetic, and dialysis patients) may not form sufficient connective tissue.

Ultra-high hydrostatic pressure (UHP) treatment has been applied in plastic surgery for the treatment of congenital giant melanocytic nevi, where excised skin is treated with UHP and reimplanted to promote skin regeneration. UHP induces cell death while preserving the structure of the extracellular matrix (ECM), thereby maintaining biocompatibility.

This pilot animal study aimed to evaluate the feasibility of UHP-treated autologous skin as a vascular patch in an animal implantation model.

Methods:A 2-year-old female Beagle (10 kg) underwent full-thickness skin harvesting from the inguinal region. The excised skin was treated with UHP (980 MPa, 10 min) and then trimmed to 10 × 5 mm before being transplanted onto the anterior wall of the same dog's common carotid artery.

No antiplatelet or anticoagulant therapy was administered postoperatively. The graft was monitored using ultrasound imaging, and the patch was excised three months post-implantation for evaluation.

Results: The patch was successfully implanted using standard vascular anastomosis techniques. Ultrasound examinations showed that blood flow through the patch was well maintained, with no aneurysmal dilation, stenosis, or thrombus formation observed. Upon excision at three months, the luminal surface was extremely smooth, with no visible thrombus or macroscopic intimal thickening.

Conclusions: This pilot animal study suggests that ultra-high hydrostatic pressure-treated autologous skin is a promising material for vascular grafting. Further investigations, including histological evaluation and mechanical strength assessment, as well as larger-scale studies, are necessary.

ADVERSE INTRAPROCEDURAL EVENTS DURING TRANSFEMORAL CAROTID ARTERY STENTING THAT MAY REQUIRE CONVERSION TO OPEN SURGERY AS A BAILOUT

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Background-Aim: To summarize our experience with patients requiring intraprocedural conversion to open surgery during transfemoral carotid artery stenting (CAS).

Methods: Our standard CAS approach is transfemoral access, use of open-cell or closed-cell stents, and distal filters for cerebral protection. We retrospectively analyzed all transfemoral CAS patients that required immediate conversion to open surgery as a bailout due to adverse intraprocedural events. Causes, management and outcome are presented.

Results: Of >700 CAS procedures performed over the last two decades, 5 cases required conversion to open surgery as a bailout. The first case was complicated by a full filter basket (Spider Fx), necessitating open surgical removal. In the second patient, the Spider Fx filter was caught during the attempted retrieval in the distal struts of the carotid stent, requiring open surgical removal. In the third case, due to technical error, the distal green segment of a Spider Fx delivery catheter broke off and remained intravascularly, necessitating open removal. In the fourth patient, a closed cell X-act stent had been deployed in a position lower than the one required to cover the entire carotid lesion. As a result, the stent did not open fully at the top, rendering withdrawal of the delivery system impossible, and the procedure was converted to a conventional endarterectomy. In the fifth case, an RX Accunet filter detachment occurred during the attempted retrieval and open surgical removal was required. Despite the adverse events, all patients had an uneventful outcome.

Conclusions: Conversion to open surgery as a bailout during transfemoral CAS is a rare occurrence. Experience with the CAS technique, attention to detail and familiarity with the endovascular materials used are all necessary to avoid some of the above scenarios. Open surgical removal may be the only option in the rare case of a full filter basket.

TREATMENT OF SUPERFICIAL VEIN THROMBOSIS WITH INTERMEDIATE DOSE OF TINZAPARIN IN PATIENTS AT HIGH THROMBOEMBOLIC RISK

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Background/Aim: Superficial vein thrombosis (SVT) is considered as a superficial form of venous thromboembolism (VTE) and may be complicated with deep vein thrombosis (DVT) and/or pulmonary embolism (PE). Additionally, the thromboembolic risk may be higher in subgroups of patients. The aim of this study was to access the treatment outcomes of tinzaparin in intermediate dose in patients with acute SVT and additional thromboembolic risk factors.

Methods: A multicenter, prospective observational study of consecutive patients with symptomatic SVT from 17 sites (academic, community hospitals, and specialist practices) in Greece, was undertaken. Patients were treated with intermediate dose of tinzaparin (131IU/Kg) once daily for a period that was at the treating physician's discretion and were followed up for at least 6 months. Patients were eligible if they had symptomatic SVT ≥5cm in length and at least one additional risk factor (≥65 years, body mass index ≥30kg/m^2, previous VTE event, cancer, autoimmune disease, thrombosis of non-varicose veins, thrombus in a supragenual segment). Primary outcomes were any adverse events including symptomatic DVT and/or PE, thrombus extension and SVT recurrence. The principal safety outcome was major bleeding. Secondary objectives were the evaluation of treatment duration with respect to the presence of each component of primary and safety outcomes.

Results: A total of 524 patients (322 females, mean age 60.3±14.2 years) were included. Median treatment duration was 49 days (45-60). Thirty-two patients (6.11%) were treated for < 30 days and 492 for ≥30 days. Outcomes related adverse event, occurred in 17 patients (96.76%, 95% CI: 95.24% - 98.27%), including 5 cases with DVT (0.95% 95%CI: 0.12-1.78%), 1 case with PE (0.19% 95%CI: 0-0.56%), 5 cases with thrombus expansion (0.95% 95%CI: 0.12-1.78%) and 9 cases with SVT recurrence (1.72%, 95% CI: 0.61-2.83%). No major bleeding events were observed, while 7 patients experienced minor bleeding events (safety performance: 98.66%, 95% CI: 97.68-99.65%). Median time to any VTE event was 40 days (23-159) and for safety events 22 days (21-26). No significant differences were observed in median treatment duration and in number of risk factors between patients with recur-

rent VTE event and in patients without [48 days (43-55) vs 49 days (45-60) (p=0.5408) and 2.2±1.1 vs 1.7±1 (p=0.1090), respectively].

Conclusions: Tinzaparin at intermediate dose is an effective and safe treatment for patients with SVT of the lower limb and additional risk factors.

URGENT TREATMENT OF VENOUS THROMBOSIS AND COMPRESSION: A SINGLE CENTER REVIEW OF 25 CASES USING THE MEDTRONIC ABRE STENT PLATFORM

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Background/Aims: This study reviews the effectiveness and safety of the Medtronic Abre stent platform in treating urgent cases of venous thrombosis and compression. Outcomes measured include technical success, symptom relief, and short-term patency in a diverse cohort of patients.

Methods: Patients presenting with symptomatic acute or subacute venous thrombosis and/or extrinsic venous compression between November 2022 and February 2025 underwent urgent/emergent endovascular recanalization with or without thrombectomy/thrombolysis in a hybrid operating theatre setting. Lesions were dilated with the Bard Atlas Gold platform and treated using the Abre stent system under routine guidance of intravascular ultrasound. Primary endpoints included technical success (restoration of venous flow) and immediate symptom relief. Secondary endpoints were short-term patency, re-thrombosis rates, and post-procedural complications.

Results: Twenty-four patients (20 males, 4 females; mean age 70 years, range 40-83) underwent 25 interventions. Twenty cases involved thoracic venous outflow occlusion proximal to end-stage-renal-disease (ESRD) patients' arteriovenous vascular access. Three cases were neoplasm induced venous obstruction and 1 case presented as phlegmasia cerulea dolens in a relatively young female with colon neoplasia and concurrent May-Thurner. Technical success was 100% with the stents successfully deployed and restoring venous flow. On average, 1.25 stents were used per intervention.

Regarding symptom relief, all patients (100%) reported significant improvement in their symptoms, such as reduced limb pain and swelling within 48 hours of the procedure.

Mean follow-up was 12.9 months (1-28 months) and primary patency was maintained in 21 out of 24 patients (87.5%). Of the three ESRD patients who did not maintain primary patency, one (4.1%) experienced early occlusion in two weeks post-intervention and was converted to a HERO graft. The second patient suffered stent occlusion 11 months post implantation and was successfully managed with recanalization and repeat stenting with no further complications. The third patient developed stenosis at 6 and 18 months which was resolved by re-angioplasty.

Post-procedural complications were zero while no cases of stent migration or fracture were observed during the study period.

Conclusion: The Abre stent system demonstrated high technical success and effective symptom relief in urgent cases of venous thrombosis and compression. Short term primary patency rate was favorable although re-thrombosis remains a concern. These results suggest that this stent platform is a valuable tool for managing acute venous conditions.

Friday May 16,2025
Conference Room 1
14.45 - 16.00

A NOVEL COMPREHENSIVE PROTOCOL FOR BRAIN PROTECTION IN AORTIC ARCH REPLACEMENT: A PROSPECTIVE COHORT STUDY

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Background: Despite technological advancements and standardized management, surgeries involving the aortic arch with circulatory arrest still exhibit a concerning rate of perioperative neurological complications. To address this issue, we propose a multidisciplinary, multimodal comprehensive brain protection protocol and aim to assess its effectiveness.

Methods: This prospective study enrolled 70 consecutive patients undergoing aortic arch replacement between September 2023 and September 2024, with 35 patients receiving the comprehensive brain protection protocol and 35 receiving the traditional protocol. The comprehensive brain protection protocol included: 1) Preoperative evaluation: A thorough assessment of the structure and compensatory capacity of the Circle of Willis and the perfusion status of brain tissue using transcranial color Doppler and cerebral computed tomography perfusion; 2) Intraoperative monitoring: Real-time monitoring of intracranial blood flow distribution and embolism detection, particularly in the posterior circulation, based on transcranial Doppler; 3) Surgical strategy: Personalized selection of cerebral perfusion methods, flow rates, and the order of supra-aortic branch anastomoses based on the evaluation and monitoring. The primary endpoint was early composite neurological complications, including stroke, cognitive impairment, delirium, and prolonged ventilation. Univariable and multivariable logistic regression analyses with different models were applied to assess the impact of the comprehensive brain protection protocol on early composite adverse events.

Results: There were no statistically significant differences in baseline characteristics between the two groups. Compared with the traditional group, the early neurological complications were significantly reduced in the comprehensive neuroprotection group (22.9% vs 45.7%; P=0.044). Multivariable logistic regression analyses across different models further confirmed that the comprehensive brain protection protocol is a significant protective factor against neurological complications (Model 1: OR 0.30, 95%CI 0.10-0.90, P=0.032; Model 2: OR 0.28, 95%CI 0.09-0.89, P=0.031;Model 3: OR 0.27, 95%CI 0.08-0.86, P=0.027). Additionally, subgroup analysis indicated that the neuroprotective effect of this integrated protocol was more pronounced in patients with cardiopulmonary bypass (CPB) duration

≥160 minutes (OR 0.14, 95% CI 0.02-0.81, P=0.028).

Conclusion: The implementation of a comprehensive, multidisciplinary approach incorporating brain assessment, real-time monitoring, and tailored protection strategies significantly reduces early neurological complications following aortic arch replacement. This personalized protocol holds promise for further adoption, particularly in high-risk patients with prolonged CPB times.

THE FROZEN ELEPHANT TRUNK OPERATION - 4 YEARS EXPERIENCE FROM SINGLE INSTITUTION

Vitalii Kravchenko[1], Alina Liubarets[1], Vasyl Lybavka[1], Ihor Zhekov[1], Iryna Osadovskaya[1], Vasyl Lazoryshynets[2]

[1] aortic pathology, M.Amosov ICVS NAMS of Ukraine

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Introduction. Surgical operation of comlex thoracic aortic pathologies involving the aortic arch, ascending and descending aorta remains a difficult and challenging procedure.

Materials and methods. From 2020 to 12/2024, in the National M.Amosov ICVS NAMS of Ukraine performed consequences 30 operations for patients with complex thoracic aortic pathology-FET-operation. The age was 29 - 73 years, median - 55.2; 24(80.0%) - were male. Concomitant CAD - in 7(23.3%), COPD - in 9(30.0%), acute/chronic renal failure - in 8(26.6%), diabetes mellitus - in 6(20.0%); PH (>70 mm Hg) - in 5(16.6%), severe mitral regurgitation - in 3(10.0%). Some patients, 13(43.3%), had previously undergone cardiac surgery (11(36.6%) were operated on for various lesions of the ascending aorta (supracoronary grafting(SCG) with hemiarch - 9, Bentall`s operation - 2); and one case after AVR and CABG, respectively). The causes of aortic disease were: acute TAAD - 4(13.3%); chronic TAAD - 13(43.3%), of which 9 were residual aortic dilation after previous SCG; non-A non-B AD - 6 (20.0%), chronic TBAD - 2(6.6%); blunt aortic injury - 2(6.6%), thoracoabdominal thoracic aortic aneurysm (TAAA) - 3(10.0%). Concomitant Yacoub operation - 2, CABG - 7 (1-3 venous autografts), MV plasty - 3, TV plication - 4 were performed simultaneously with main procedure. We performed all operations with a 25ºC hypothermia and antegrade cerebral perfusion for all three cerebral vessels. For 26 operations, we used the E-Vita Hybrid stent graft (E-Vita Open Plus - 14, E-Vita Open Neo - 12), in 4 cases the Cronus stent graft system (Endovastec) was implanted. Seven operations were performed urgently.

Results. The median Euroscore II was 23.9% and the 30-day mortality was 10.0% (3 patients). The cause of death was stroke, acute pulmonary insufficiency and multiorgan failure. Two patients had neurological complications - persistent paraplegia and transient stroke. Renal failure requiring temporary dialysis occurred in 4 patients. Bleeding requiring retrothoracotomy - 1 case. Prolonged mechanical ventilation was in 5 patients.

Conclusions. The operation “stabilized elephant trunk” allowed for a comprehensive one-stage treatment of patients with significant lesions of the arch and adjacent parts of the aorta with satisfactory short- and medium-term results.

SAFETY AND EFFECTIVENESS OF SURGICAL REPAIR FOR PENETRATING ATHEROSCLEROTIC ULCER IN THE AORTIC ARCH: INSIGHTS FROM A 12-YEAR RETROSPECTIVE COHORT

Luchen Wang[1], Yanxiang Liu[1], Bowen Zhang[1], Jialiang Li[1], Sangyu Zhou[1], Ruojin Zhao[1], Cuntao Yu[1], Xiangyang Qian[1], Yaojun Dun[1], Xiaogang Sun[1]

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Objective: This study was designed to evaluate the perioperative and long-term outcomes of surgical treatment, including open and hybrid repairs, for patients with penetrating atherosclerotic ulcer (PAU) in the aortic arch.

Methods: A retrospective analysis was conducted on 72 patients with PAU in the aortic arch who underwent surgical treatment including open and hybrid repairs between January 2010 and December 2022. The study included 10 patients in the urgent repair group and 62 patients in the elective repair group. The primary endpoints included major adverse events and long-term survival. Major adverse events included in-hospital mortality, reoperation for bleeding, stroke, paraplegia, and acute renal failure.

Results: The rate of major adverse events was 13.9% (10/72), with an in-hospital mortality rate of 2.8% (2/72). The mean follow-up period was 69 months. The overall survival rates at 1, 5, and 7 years after surgery were 95.8%, 91.8%, and 86.0%, respectively. Subgroup and regression analyses showed that urgent repair was not significantly associated with the occurrence of major adverse events and long-term survival. Age (OR 1.12, 95% CI 1.00-1.26; P=0.042) and diabetes (OR 5.98, 95% CI 1.01-35.32; P=0.048) were found to be independent risk factors for major adverse events as well as NYHA grade ≥III (HR 14.68, 95% CI 2.11-102.10; P=0.007) and diabetes (HR 5.39, 95% CI 1.10-26.37; P=0.038) proved to be independent risk factors for overall survival.

Conclusions: The surgical management of PAU in the aortic arch, utilizing hybrid and open repairs, demonstrates safety and effectiveness, with favorable perioperative and long-term outcomes. However, heightened vigilance may be required for elderly patients, diabetic patients, and those with cardiac insufficiency.

MODIFIED AORTIC ROOT REPAIR WITH PRESERVATION OF THE FALSE LUMEN IN ACUTE STANFORD TYPE A AORTIC DISSECTION: A RETROSPECTIVE COHORT ANALYSIS

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Background: Aortic root repair (ARr) has been increasingly used for the treatment of acute Stanford type A aortic dissection (ATAAD) due to its clear advantages in preserving the aortic sinus and aortic valve. However, the artificial materials and glues required to eliminate the false lumen in the sinus still affect the physiology and function of the root. Therefore, we pioneered a modified ARr that retains the false lumen within the sinus.

Methods: We retrospectively analyzed 124 ATAAD patients with root involvement but less than 45 mm in diameter and without comorbid connective tissue disease who underwent modified ARr between 2017 and 2022. Primary endpoints were mid-term survival and reoperation rate for aortic root pathology. Secondary endpoints was early composite adverse events, which encompassed 30-day mortality, reoperation for bleeding, myocardial infarction, stroke, paraplegia, and renal failure needing dialysis.

Results: The early adverse event rate was 10.5%. Specific rates were: 30-day mortality (1.6%), reoperation for bleeding (1.6%), myocardial infarction (0%), stroke (2.4%), paraplegia (1.6%), and dialysis (3.2%). The median follow-up period was 65 months, during which no residual or new dissection in the aortic sinus was identified by aortic CTA, and normal aortic valve structure and function were demonstrated by echocardiography. Overall survival rates at 1, 3, 5, and 7 years were 98.4%, 97.5%, 95.3%, and 85.3%, respectively. Malperfusion syndrome was identified by multivariable logistic and Cox regression analyses as an independent predictor of overall survival (HR 13.75, 95%CI 2.38-79.27; P=0.003) and early composite adverse events (OR 9.04, 95%CI 1.95-41.93; P=0.005).

Conclusions: The modified reconstruction technique without elimination of the intra-sinus dissection is a feasible option for ARr with simpler management and satisfactory prognosis, which is friendly to cardiac surgeons with limited experience. However, enhanced vigilance and meticulous monitoring are essential, particularly for patients with malperfusion syndrome.

THE ROLE, IMPORTANCE AND RESULTS OF HEART VALVE TEAM IN THE TREATMENT OF HIGH RISK PATIENTS WITH AORTIC STENOSIS

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Background -Aim: transcatheter aortic valve implantation has revolutionized the management of severe aortic stenosis, particularly for patients deemed high-risk or inoperable for surgical valve replacement. Although multidisciplinary decision-making is essential in determining the optimal treatment of valvular diseases, there are few reports on the clinical effectiveness of this approach. The aim was to investigate the short- and medium-term results of the heart valve team (HVT) in our institute and compare them with international data.

Methods: Between 01.03.2020 and 31.01.2023, 238 cases of multidisciplinary decision making were performed to determine the treatment of severe aortic valve disease. Only patients considered high-risk or inoperable for surgical aortic valve implantation (SAVR) were evaluated by our heart team. The other patients underwent SAVR. The mean age of 123 female and 115 male patients was 80.4±5.8 (60-95) years, their mean ejection fraction was 51±10 (18-73)%, their EuroScore II was 6.06±6.01 (1.2-66.0)%, and the vast majority had a moderate to high surgical risk. Perioperative data and follow-up outcomes were analysed by retrospective review and summarisation of patient records and heart team protocols. The valvular heart team recommended transcatheter aortic valve implantation in 225 patients (95.0%), surgical valve replacement in 3 patients (1.3%), balloon valvuloplasty in 2 patients (0.8%), followed by surgical or transcatheter aortic valve implantation depending on the outcome, and conservative management in 7 patients (2.9%).

Results: 195 patients had undergone transcatheter aortic valve implantation by the end of the study. The most frequent complications were left Tawara branch block and grade III. atrioventricular block in 46 (23.6%) and 18 (8.2%) cases, respectively. Permanent pacemaker implantation was required in 31 (15.9%) patients. Pericardium fenestration or sternotomy for haemopericardium and surgical treatment of vascular injury were performed in 3-3 (1.5-1.5%) cases. A total of 44 patients (18.5%) died during a follow-up period of almost 4 years. Twenty-two (9.2%) of these died on the waiting list and 2 (0.8%) during the procedure. One-year mortality rate was 5.6% (11 patients), while a further 7 patients (3.6%) died by the end of the study.

Conclusions: our results demonstrate that multidisciplinar decisions made by the heart valve team resulted in low mortality and complication rates, with good short- and medium-term survival, consistent with data reported in the international literature. Our favorable experience supports the primary hypothesis of the study that multidisciplinary decision making leads to highly favourable outcomes.

TEN YEARS EXPERIENCE OF TYPE A AORTIC DISSECTION ANEURYSMS SURGICAL TREATMENT

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Introduction. Despite the significant progress of medicine since the beginning of the 21st century, the treatment of patients with type A aortic dissection remains one of the most complex challenges in the cardiac surgery. The sudden onset of the disease, the severity of the first hours, the difficulty in establishing an accurate diagnosis, and the organization of comprehensive medical care are key negative factors that significantly influence and worsen treatment outcomes for this complex pathology. Contemporary literature sources report a hospital mortality rate of 10.2% to 18.9% as a result of surgical treatment of this desiase in high volume aortic world surgical centers.

Objective. To present approaches to the treatment of aortic dissection over the past 10 years, analyze the causes of dissection, and evaluate treatment outcomes.

Materials and Methods. Between January 1, 2015, and December 31, 2024, a total of 510 patients with acute type A aortic dissection (ATAAD) underwent surgery at the M. Amosov National ICVS of the NAMS of Ukraine. Among them, 408 (80.0%) were men and 102 (20.0%) were women. The patients' ages ranged from 22 to 83 years, meen 53.0±10.2 years. The diagnosis of TAAD was based on clinical presentation, angiography, CT-ngio and EchoCG.

The primary factors contributing to aortic dissection included arterial hypertension in 388 patients (76.1%), Marfan syndrome in 21 (4.1%), bicuspid aortic valve in 29 (5.7%), syphilis in 3 (0.6%), Takayasu arteritis in 2 (0.4%), and falls from height in 2 (0.4%), both of whom had a bicuspid aortic valve. In five pregnant women (1.0%), acute aortic dissection developed in the third trimester, requiring an initial cesarean section; all infants survived.

The majority of patients underwent surgery in the acute stage (within two weeks of dissection onset) - 454 (89.0%), and the subacute stage (up to six weeks) - 56 (11.0%).
A total of 442 (86.7%) patients had type I dissection (extending from the aortic valve to varying extents, including iliac arteries), with intramural hematomas found in 13 cases and penetrating aortic ulcers (PAU) in 3. Type II dissection (only ascending aorta according to the DeBakey classification) was observed in 58 patients (11.4%). A non-classifiable dissection (non A non B) was diagnosed in 10 patients (2.0%). Hemopericardium was found in 234 cases (45.9%), with cardiac tamponade occurring in 75 (14.7%) patients (400-800 ml of blood in the pericardium cavity). Ten patients (2.0%) had previously undergone cardiac surgery.
We performed operation under cardiopulmonary bypass with moderate hypothermia (28-32°C). In cases of hemiarch or total arch replacement (400 patients, 78.4%), deep hypother-

mia (20-22°C) was used with retrograde (n=258) or antegrade cerebral perfusion (n=49). In 91 patients, deep hypothermia with circulatory arrest was applied; one patient underwent retrograde cerebral perfusion plus circulatory arrest (CA), and three underwent antegrade cerebral perfusion plus CA.
Due to critical malperfusion, 14 (2.7%) patients underwent various vascular anastomoses before the main surgical procedure to restore circulation in affected areas. Five (35.7%) of these patients died postoperatively, while the remaining nine (64.3%) successfully underwent the main stage of surgery.
For surgical treatment of acute/subacute aortic dissection, the following procedures were performed: supracoronary replacement of the ascending aorta in 50 (9.8%) patients, supracoronary replacement with hemiarch repair in 328 (64.3%), supracoronary replacement with total arch replacement in 17 (3.3%), and aortic valve resuspension in 37 (9.4%) patients. The Bentall procedure was performed in 39 (7.6%) cases, Bentall with hemiarch repair in 28 (5.5%), conventional elephant trunk in 6 (1.2%), and frozen elephant trunk in 7 (1.4%). Other procedures were performed in 35 (6.9%) patients.
In 53 (10.4%) patients, additional procedures were performed, including aorto/mammary-coronary bypass grafting (1-5 grafts) in 40 (7.8%), mitral valve repair in 7 (1.4%), mitral valve replacement in 2 (0.4%), and tricuspid valve annuloplasty in 4 (0.8%). In 16 patients (3.1%), coronary artery reimplantation was required due to involvement in the dissection process: right coronary artery in 8 cases, left coronary artery in 6, and both in 2.

Results. The overall hospital mortality rate was 6.1% (31 patients), with 6.4% for acute dissection and 3.0% for subacute cases. The causes of death included acute cardiovascular failure in 4 cases (including 2 due to coronary malperfusion), hemorrhage in 2, visceral organ malperfusion in 11, stroke in 5 (2 due to malperfusion), multiple organ failure syndrome in 7, and COVID-19 infection with severe lung insufficiency in 2 patients.

Conclusion. The accumulation of experience, comprehensive planning and execution of surgical interventions, and advancements in protective strategies for the heart, brain, and visceral organs in type A aortic dissection surgery have resulted in a hospital mortality rate of 6.1%.

RUPTURED SINUS OF VALSALVA WITH AORTO-CAMERAL FISTULA

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Background: The Sinus of Valsalva (SoV) are aortic root spaces. Abnormal dilation leads to Sinus of Valsalva Aneurysm (SOVA), often asymptomatic and detected incidentally. Ruptured SOVA presents with dyspnea, chest pain, and palpitations, commonly forming an aorto-cameral fistula. Surgical repair is crucial to prevent heart failure, arrhythmias, and endocarditis.

Case Report: A 34-year-old female presented with Canadian Cardiovascular Society (CCS) class II angina, New York Heart Association (NYHA) class IV dyspnea, exertional palpitations, progressive pedal edema, and abdominal distension for four months. Symptoms developed postpartum following an uneventful vaginal delivery of her second child. She had a history of orthopnea and paroxysmal nocturnal dyspnea after her first pregnancy three years prior, though symptoms were milder.

Initially advised surgery, she opted for medical management. While pharmacotherapy controlled her symptoms, she required intermittent emergency care. During her second pregnancy, she discontinued prescribed medications in the second trimester, leading to deterioration and eventual bedbound status postpartum. Despite consultations with multiple cardiac surgeons, she was deemed high risk for surgery.

On presentation to the Peshawar Institute of Cardiology emergency department, she was tachycardic, tachypneic, hypotensive, and pale, with bilateral pedal edema extending to the thighs and significant abdominopelvic ascites. Cardiovascular examination revealed a continuous machinery murmur along the left parasternal border, with preserved bilateral vesicular breath sounds. Abdominal examination showed hepatomegaly and uniform distension. Laboratory investigations revealed leukocytosis, hepatic dysfunction, and renal impairment (eGFR 10.18 ml/min/1.73m^2, Creatinine 5.27 mg/dL). Ultrasonography confirmed gross ascites and mild hepatomegaly. Transthoracic echocardiography demonstrated a ruptured sinus of Valsalva (SoV) into the right ventricle, bicuspid aortic valve with a sub-aortic ridge, severe aortic regurgitation, a 15 mm rupture defect, anterior mitral leaflet sagging with moderate mitral regurgitation, and severe tricuspid regurgitation due to annular dilation.

After 24 hours of unsuccessful medical stabilization, she underwent emergency surgical repair. Intraoperatively, right heart volume overload was evident. The rupture involved the right coronary sinus and extended into the aortic annulus, with left ventricular outflow tract obstruction (LVOTO) due to a sub-aortic ridge. The ridge was resected, and the rupture was repaired using pledgeted 4-0 Prolene interrupted sutures. A 21 mm On-X mechanical aortic valve prosthesis was implanted with pledgeted 2-0 Ethibond sutures, reinforcing the SoV repair. Tricuspid valve repair via right atriotomy achieved competence.

Postoperatively, she had an uneventful recovery, spending four days in the ICU and three days in the ward. Pedal edema and ascites improved significantly within a short period.

CARDIOMEGALY AFTER OPEN AORTIC ARCH ANEURYSM REPAIR: CAUSES, SIGNIFICANCE AND THERAPEUTIC MANAGEMENT

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Objective: To analyze the relationship between cardiomegaly and open aortic arch aneurysm repair, identifying the causes, clinical significance and the appropriate therapeutic approach to avoid serious complications.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane, etc.

Results: Cardiomegaly can be caused by various factors after surgery, such as increased myocardial load, blood flow disorders, residual hypertension and myocardial dysfunction. These causes lead to serious cardiological complications such as heart failure, arrhythmias and reduced cardiac output, requiring continued monitoring of cardiac function via echocardiography and MRI.

Conclusions: Cardiomegaly is a serious complication after aortic arch aneurysm repair, negatively affecting the patient's quality of life and prognosis. Early recognition, medication, and cardiac function monitoring are critical for effective management of the condition.

Friday May 16,2025
Conference Room 2
14.45 - 16.00

MID-TERM RESULTS OF FEMORO-POPLITEAL BYPASS WITH THE USE OF A HEPARIN-BONDED ePTFE GRAFT: EXPERIENCE OF TWO VASCULAR CENTERS IN GREECE

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Background-Aim: There is still big controversy in the literature whether an endovascular or bypass intervention strategy is the best option for patients with chronic limb-threatening ischemia (CLTI) and infrainguinal disease. The aim of this study is to report mid-term results of infrainguinal bypasses in patients with CLTI using ePTFE grafts and their comparison with vein bypasses.

Methods: Between 2017-2025, 109 patients submitted to infrainguinal revascularization using a heparin-bonded ePTFE graft (HepBePTFE) or a vein conduit, in two Greek vascular centers. Patients pre-, intra- and postoperative, as well as follow-up (FU) data were prospectively collected in a registry. Early and mid-term results were analysed in terms of primary and secondary graft patency, amputation and survival rates with Kaplan-Meyer curves; Cox regression analysis for primary, secondary patency, amputation and survival was also performed.

Results: Patients were predominantly male (89.9%), with a mean age of 70 years. CLTI was present in 82 patients (75.2%), with Rutherford class 5 or 6 in 55% (60/109). 80 patients (73%) received an above-knee (AK). In all patients with AK bypass, a HepBePTFE graft was used. Among patients with BK bypass (29), a vein conduit was used in 17 cases, while an ePTFE graft in the rest.

30-day mortality rate was 2,75%. Mean follow-up period was 15.5 months (S.D. 16.4, range 1-69). Primary, secondary patency and limb salvage were 86.1% (standard error, SE, 0.09), 94.5% (SE, 0.09) and 88.1% (SE 0.06) at 32 months respectively. Overall survival rate was 78.9% (SE 0.16) at 72 months of FU. Comparing patients with AK and BK bypasses, primary patency rates were 88.6% at 32 months and 79.3% at 24 months (p=0.039, log rank 4.2), while secondary patency rates were 96.3% and 89.7% at 32 months, respectively (p=0.019, log rank 5.4). In patients with an ePTFE graft compared to those with a vein conduit, primary patency rates were 87.8% at 32 months and 77.8% at 18 months, respectively (p=0.042, log rank 4.1). Cox regression analysis showed rutherford 5 and 6 was the only factor associ-

ated to amputation during FU. (p=0.034, log rank 4.2).

Conclusion: The use of a HepBePTFE graft showed good early and mid-term results, with optimal primary patency and excellent secondary patency rates. Despite the small numbers of the study, it seems that HepBePTFE graft can be considered an acceptable alternative to autologous vein when it is unavailable or of poor quality, especially in the AK setting.

SHOCKWAVE INTRAVASCULAR LITHOTRIPSY IN THE MANAGEMENT OF HOSTILE ILIAC ACCESS DURING ENDOVACULAR AORTIC REPAIR

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Background: The application of endovascular therapies in the treatment of aortic pathologies is gaining increasing popularity. However, a major limitation of current endovascular devices are large bore sheaths in combination with calcified access vessels. Although iliac artery calcification may not always result in stenosis, calcification can contribute to the loss of elasticity and compliance. In contrast to conventional angioplasty, Shockwave intravascular lithotripsy (IVL; Shockwave Medical) uses ultrasonic waves to induce micro-fracturing in calcified plaque. IVL allows for enhanced vessel compliance by fracturing calcifications of both intimal and medial layers without injuring the vessel.

Aim: To report the use of Shockwave Intravascular Lithotripsy (IVL) in the management of hostile iliac access during endovacular aortic repair.

Methods: All patients who underwent endovascular aortic repair for infrarenal, pararenal or thoracoabdominal aneurysm with hostile access vessels (circumferential calcifications extended to more than 50% of the vessel length, hemodynamic stenosis, or occlusions) were included in the present study. Pre-, intra-, and postoperative data were collected and retrospectively analyzed. Technical success, early complications, reinterventions and mortality were recorded.

Results: From January 2023 to March 2025, 372 patients underwent endovascular aneurysm aortic repair at our department. 21 (5.6%) had hostile iliac access, where IVL was used. Technical success was achieved in all cases; there were no cases of dissection, peripheral embolization or vessel rupture. During the follow-up period, no case of restenosis or limb occlusion was recorded.

Conclusions: Our experience shows that IVL in hostile iliac access during endovacular aneurysm aortic repair is safe and effective. The IVL system is an additional tool in the vascular surgeon's armamentarium to obtain large-bore access in hostile access vessels. Further studies are needed to better assess the clinical effectiveness of the IVL system.

ASSOCIATION BETWEEN MEAN ARTERIAL PRESSURE FLUCTUATION WITH POOR PROGNOSIS OF ISCHEMIC STROKE

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Background: Currently, there are few studies investigating the association between fluctuations in mean arterial pressure and the prognosis of ischemic stroke. The aim of this research is to evaluate the relationship between mean arterial pressure variability during hospitalization and the clinical outcomes assessed three months following an ischemic stroke event.

Methods: A total of 3,971 ischemic stroke patients from the CATIS trial, who underwent blood pressure measurements during their hospital stay and completed a three-month follow-up, were included in this analysis. The fluctuations in mean arterial pressure during hospitalization were quantified using two parameters: the standard deviation of mean arterial pressure (MAP-SD) and the difference between the maximum and minimum mean arterial pressure values (MAP-DMM). A face-to-face follow-up was conducted three months after the onset of the stroke. The primary outcome was defined as a composite of death and major disability, while secondary outcomes included major disability and mortality. A multivariate logistic regression model was employed to assess the association between MAP fluctuations and the study outcomes during hospitalization, with odds ratios (OR) and 95% confidence intervals (CI) calculated.

Result: At the three-month follow-up assessment, a total of 1,000 patients were reported to have experienced either mortality or major disability, which included 122 deaths and 878 cases of major disability. The multivariable adjusted ORs (95% CIs) for MAP-SD indicated a value of 1.39 (1.10-1.75) for the primary outcome, 1.96 (1.12-3.41) for death, and 1.24 (1.08-1.57) for major disability when comparing the extreme quartiles of MAP-SD. For MAP-DMM, the multivariable adjusted ORs (95% CIs) for the highest quartile compared to the lowest quartile were 1.43 (1.13-1.80) for the primary outcome, 1.83 (1.07-3.13) for death, and 1.28 (1.08-1.63) for major disability. Additionally, multivariable adjusted spline regression models demonstrated linear associations between both MAP-SD and MAP-DMM with the primary outcome, death, and major disability (all P-linearity <0.05).

Conclusions: Significant fluctuations in mean arterial pressure during hospitalization are associated with an elevated risk of death or major disability at three months following an ischemic stroke, indicating that such fluctuations serve as an independent risk factor for adverse outcomes.

Key words: Ischemic stroke; Mean arterial pressure fluctuation; Poor prognosis

ENCAPSULATION OF MONOCLONAL ANTIBODIES AND POLYPHENOLS: A NEW PARADIGM FOR VASCULAR DRUG DELIVERY

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Background: Arterial occlusive diseases serve as a primary trigger for severe complications, including ischemia, stroke, myocardial infarction, and limb amputation. Developing a targeted therapeutic strategy for atherosclerosis could substantially enhance current surgical interventions. At present, there are promising drugs that failed in the treatment of atherosclerosis due to negative systemic effects. In this context, vascular drug delivery emerges as a promising research field, offering novel therapeutic solutions for the atherosclerosis, making possible the modulation of atherosclerosis-related inflammation, especially in its first stages. This study presents liposomes and polymeric nanoparticles engineered for the encapsulation of a wide range of bioactive molecules (*i.e.*, monoclonal antibodies and polyphenols). The nanoparticles are functionalized with immunouteroglobin-1 (IUG-1), a recombinant protein designed to selectively bind the extra-domain B of fibronectin in atherosclerotic plaque with the aim of targeting the nanoparticles to the plaque inducing a targeted delivery of the bioactive molecules.

Methods: Liposomes (LPs) and polymeric nanoparticles (PNPs) were produced by thin-film hydration method and an emulsion solvent evaporation approach, respectively. PNPs were prepared employing a water/oil/water double emulsion system, where therapeutic monoclonal antibodies (mAbs) and polyphenols were incorporated into the polar phase. Functionalization with IUG-1 was performed *via* a covalent coupling reaction facilitated by 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride and *N*-hydroxysuccinimide. The morphological characteristics of the LPs and PNPs were studied through nanoparticle tracking analysis and electron microscopy. Additionally, their size distribution and ζ-potential were measured using dynamic light scattering. The controlled release profile of mAbs and polyphenols over time was quantified. Biocompatibility was determined by evaluating mitochondrial activity and measuring lactate dehydrogenase levels.

Results: LPs and PNPs were effectively produced, displaying diameters of approximately 200 nm and a net negative surface charge. Functionalization with IUG-1 led to an increase in nanoparticle size and a decrease in ζ-potential. A further increase in mean diameter was observed following incubation in human serum for 24 and 48 hours. As therapeutic carriers, LPs and PNPs demonstrated a sustained release profile of encapsulated mAbs and polyphenols. Biocompatibility assessments indicated that LPs and PNPs were well tolerated by endothelial cells, macrophages, and red blood cells, even at the highest tested concentrations.

Conclusions: Taken together, the investigated nanoparticles represent a promising therapeutic strategy with the potential to enhance pharmacological interventions for atherosclerotic plaque. LPs and PNPs serve as an advanced platform for mAb and polyphenol encapsulation, ensuring further *in vitro* and *in vivo* exploration for the development of innovative treatment protocols in vascular medicine.

THE RESULTS OF THE TREATMENT OF THE INJURIES OF THE MAIN VESSELS FOR THE PERIOD 2014-2024

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AIM: The aim of this study is to analyse the results of the treatment and clinical outcomes in patients with injuries of the main vessels of the extremities in the period of 2014-2024.

METHODS: We have analysed 900 cases of injuries of the main vessels of the extremities who have undergone treatment at our medical facility from 2014 to 2024. The inclusion criteria were: 1. Military servicemen of the Armed Forces of Ukraine; 2. Patients who had non-lethal injuries; 3. Patients who required interventions on the main vessels; 4. Males; 5. Patients under 60 years old; 6. Absence of the comorbidities. The exclusion criteria involved: 1. All civilians with vascular injuries; 2. Lethal injuries registered before evacuation to specialized vascular surgical assistance; 3. Females; 4. Patients over 60 years old; 6. Presence of severe comorbidities.

Results: Among injuries involved damage of the artery was in 35,1%; in 10,5% - demage of the vein; in 54,4% - both. The localisation of the injuries was the following: in 76,5% of the injuries were in femoropopliteal area, in 21,6% - peroneal, in 1,9% - both.

There was performed 9234 operations in 900 patients; 15% of them - on the main vessels, 2,7% - amputations and re-amputations, 67,6%- surgical treatments, 14,1% - other - on perforating main veins due to postthrombotic disease

Analysing the results of treatment in 74,5% there was identified satisfactory result and in 23,8% - the treatment resulted in amputation, 1,7% - mortality.

86.3% of the victims had massive soft tissue damage to the limbs, which complicated treatment. Correction of the main blood flow was the basis of success, but local treatment was crucial.

Conclusions: Injuries of the main vessels remain controversial and sophisticated area of the vascular surgery both, in therapeutic and organisational ways. Taking into account a significant part and severity of the gunshot wounds of the vessels, the main task for medical professionals today is the creation of the clear algorithm of the effective medical assistance to all patients on the stage of medical evacuation directed at rescue of life from acute bleeding, saving of the extremity, treatment of complications and outcomes of the vascular injury, and foundation of the system of the specialized surgical assistance and rehabilitation in the corresponding referral centres.

LOW-PROFILE ATHERECTOMY-ASSISTED CRURO-PEDAL ANGIOPLASTY IN PATIENTS WITH CHRONIC LIMB-THREATENING ISCHEMIA AND PATENT FEMORO-POPLITEAL/ CRURAL BYPASS GRAFTS

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Background and Aim: A patent bypass graft does not necessarily equate to effective limb salvage, as patients may develop progressive below-the-knee (BTK) arterial disease despite maintained graft patency. We observed a subset of patients with chronic limb-threatening ischemia (CLTI) who, despite patent femoro-popliteal or femoro-crural bypass grafts, presented with persistent ischemic symptoms, including non-healing trophic lesions and rest pain. This study aimed to evaluate the safety and efficacy of utilizing patent bypass grafts as access routes for endovascular intervention in BTK and pedal lesions in patients with CLTI.

Methods: Between January 2022 and December 2024, six patients (4 male, 2 female; mean age 72 years) with advanced peripheral arterial disease (Rutherford categories 4-6) were prospectively enrolled. All patients had significant comorbidities, including hypertension, diabetes mellitus, coronary artery disease, and chronic kidney disease, and presented with symptomatic BTK and pedal artery disease despite patent infrainguinal bypass grafts.

Preprocedural evaluation included ankle-brachial index (ABI) measurement, duplex ultrasonography, and angiography. Endovascular revascularization was performed using either a retrograde “up-and-over” approach (n=4) or antegrade access via the patent bypass graft (n=2). The intervention protocol comprised vessel recanalization, lesion preparation using low-profile rotational atherectomy, and prolonged (>5 minutes) plain old balloon angioplasty (POBA). The primary endpoint was the achievement of at least one-vessel runoff to the foot.

Results: Technical success was achieved in all cases (100%), with successful restoration of at least one direct vessel runoff to the foot. All patients experienced resolution of rest pain and significant symptomatic improvement. Minor amputations were performed in three patients, while one required a Syme amputation. Freedom from major adverse cardiovascular events (MACE) was maintained throughout the 30-day follow-up. One patient developed a localized hematoma at the puncture site, which resolved with conservative management. At six-month follow-up, primary patency was 83.3% (5/6), and limb salvage was achieved in all patients (100%).

Conclusions: This study demonstrates that a tailored approach combining existing surgical bypasses with advanced endovascular techniques offers a viable treatment option for patients with patent grafts but progressive BTK disease. Strategic utilization of patent bypass grafts as access conduits for BTK/pedal interventions may optimize outcomes in this challenging population. A holistic approach incorporating both open and endovascular modalities appears essential in managing complex PAD patients with multilevel disease.

REAL-WORLD 12-MONTH OUTCOMES WITH SIROLIMUS-COATED BALLOON ANGIOPLASTY FOR COMPLEX FEMOROPOPLITEAL DISEASE

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Background: Sirolimus-coated balloons (SCBs) have emerged as a promising alternative to paclitaxel-coated devices for the treatment of femoropopliteal lesions. However, real-world data on SCB performance in also complex peripheral arterial disease remains unknown. We sought to evaluate the safety and 12-month clinical outcomes of the Solution SLR™ balloon angioplasty in a challenging real-world patient cohort.

Methods: This single-center, retrospective observational study with prospective follow-up included 21 patients with symptomatic peripheral arterial disease treated with the Solution SLR™ SCB (Med. Alliance, SA, Mont-sur-Rolle, Switzerland) after vessel preparation with rotational atherectomy, between October 2023 and November 2024. The primary endpoints were technical success, 12-month primary patency, and target lesion revascularization (TLR). Secondary endpoints included major adverse cardiac events (MACE), major adverse limb events (MALE), and changes in Rutherford classification and ankle-brachial index (ABI).

Results: The median age was 79 years, with 47.6% of patients over 80 years old. Most patients presented with advanced peripheral atherosclerotic disease (PAD) (Rutherford category V, 47.6%). Lesions were predominantly occlusive (76.2%), with a median length of 130 mm and severe/moderate calcified in 71.4% of cases. Technical success was achieved in 95.2% of procedures. The 12-month primary patency was 95%, with a TLR-Rate of 5%. No major amputations or cardiovascular deaths occurred. Significant improvements in Rutherford category and ABI were maintained at 12 months.

Conclusions: In this real-world cohort of patients with complex PAD, vessel preparation-assisted Solution SLR™ angioplasty demonstrated safety and promising 12-month outcomes. These findings support the use of SCBs in also challenging peripheral interventions, though larger-scale data and further follow up are needed in order to establish SCBs' role as crucial in the treatment algorithm of PAD.

INFRARENAL AORTA ANGIOPLASTY -SINGLE CENTER RETROSPECTIVE STUDY-

Konstantinos Maltezos, Apostolos Chaveles, Vasileios Gatsos, Sotirios Giannakakis[1], Stavros Kerasidis, Georgios Kastrisios, Chrysostomos Maltezos

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Introduction: The aim of our study is to present our clinical experience with the endovascular treatment of stenosis in the infrarenal abdominal aorta.

Method: We mention our clinical experience with the endovascular treatment of abdominal aortic stenosis over the past 10 years.

Results: A total of 13 patients underwent treatment, including 2 men and 11 women, with a mean age of 63 years. In one patient, in addition to aortic angioplasty, an endarterectomy of the common femoral artery with a venous patch was performed. Another patient underwent simultaneous aortic angioplasty and common iliac artery angioplasty with a balloon.

Seven patients received balloon-expandable stents (6 Palmaz and 1 Bentley). In one patient, aortic angioplasty was performed alongside common iliac artery angioplasty using a balloon-expandable stent, as well as a common femoral artery endarterectomy. Another patient underwent aortic angioplasty in combination with common iliac artery angioplasty using a kissing balloon-expandable stent and common femoral artery endarterectomy.

In three patients, angioplasty of the aorta and common iliac arteries was performed (CERAB technique), with VBX stent grafts.

Postoperative follow-up ranged from 1 to 6 years. All treated patients remained free of complications.

Conclusions: In recent years, intravascular techniques have gained prominence in the treatment of abdominal aortic stenosis and peripheral arterial disease of the lower extremities. A review of the literature suggests that further studies are needed to compare these techniques with open surgical repair for the definitive treatment of aortic stenosis and occlusion.

Friday May 16,2025
Conference Room 1
16.00 - 17.00

CEREBRAL COMPLICATIONS AFTER SURGICAL CORRECTION OF THE DIFFERENT FORMS OF CORONARY ARTERY DISEASE

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AIM: To analyze cerebral complications after surgical correction of the different forms of coronary artery disease (CAD).

METHOD: for 354 random patients with CAD we performed standard preoperative diagnostic investigations and surgical myocardial revascularization with correction of complicated forms of CAD in 160 cases. Duplex scanning of brachiocephalic arteries before operation was performed for 280 (79.09%) patients.

RESULTS: Stroke in anamnesis had 43 (12.1%) patients. Stenosis of the internal carotid arteries more than 50% (NASCET) was diagnosed in 95 (33.9%) cases. Non-fatal cerebrovascular complications (CVC) were developed in 10 (2.8%) patients after operation. In 6 (3.09%) cases after isolated CABG occurred CVC, including TIA - in 2 (1.03%), stroke - in 4 (2.06%). Among patients with complicated CAD, focal and cerebral neurological symptoms in the postoperative period were registered in 4 (2.5%) patients, of whom 3 (1.8%) with TIA neurological symptoms regressed, and in 1 (0.62%) patient with diagnosed ischemic stroke - were stable ones. Statistical analysis of perioperative period showed increased risk of CVC in patients with Stroke anamnesis (50%, p=0.0002), calcification of aorta (40%, p=0.003), atrial fibrillation (30%, p=0.013) and significant decrease of blood pressure (BP) on the 1st postoperative day (systolic BP from 142.5±27.4 to 110.6±16.1, p = 0.005; diastolic BP from 80.5±12.7 to 60±10 mmHg, p=0.0008).

CONCLUSIONS: for patients with stable CAD and clinical manifestations of hemodynamically significant stenosis of carotid arteries neurosurgical procedure should perform first. Atheromatous aorta is indication for total arterial revascularization. Individual approach with strict monitoring of blood pressure and prevention of hypotension are required at all stages of perioperative patients' management.

LEFT MAIN ACUTE DISSECTION SETS OFF AVALANCHE OF CHALLENGES FOR THE CARDIAC SURGEON

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Medpark International Hospital, State University of Medicine and Pharmacy "Nicolae Testemitanu"

Background-AIM. Left Main coronary artery dissection is a rare entity that is usually caused by guidewire or catheter manipulation during coronary angiography or an interventional procedure with an incidence of less than 0.1%. In recent years, spontaneous coronary artery dissection has been increasingly recognized as an important cause of acute coronary syndrome, accounting for up to 35% predominance of cases in a female patient.

Case report. We report the case of a patient 69-year-old, who underwent coronary angiography, because of heavily aortic valve stenosis, where severe coronary atherosclerotic lesions are attested (Left Main 90% stenosis, also left anterior descending artery stenosis 90%, circumflex artery stenosis 60%). During the procedure an iatrogenic event occurred - Left Main dissection with suspicion of aortic extravasation and hemodynamically instability. The patient was urgently referred for surgery. At transesophageal echocardiography confirmed severe aortic valve stenosis and beginning of aortic dissection starting at origin of Left Main. Intraoperatively, firstly 2 CABG (LIMA to LAD, and vein to PLA2) was done. After that aortotomy was performed and careful revision of Left Main was taken. Plaque dissection was observed with a very small leak sub adventitial of the aorta. The dissecting plaque was removed and 5 pledjets sutures with Prolen 5/0 were applied from outside-inside-outside to restore the wall of the Left Main coronary artery. But because we couldn't achieve the tightness of the aortic wall. The decision was immediately made to implant intraoperatively by direct vision a 3.5x 12 mm coronary stent to ensure blood flow and to protect from further leakage. Aortic valve replacement with biological prosthesis was performed. Postoperatively, the patient had a favorable outcome. On the 6th postoperative day diagnostic coronary angiography was repeated which confirmed the patency of the stent and the grafts. The patient was discharged on the same day. This category of fragile patients requires an early attitude, multidisciplinary collaboration and surgical dexterity. Although intraoperative stenting carries the risk of advancing the guidewire into the false lumen and extending the dissection, which could endanger coronary flow, the stenting strategy for left coronary artery dissection could be an a priori choice for this emerging and severe condition.

KIDNEY FUNCTION OF CARDIAC SURGERY PATIENTS WITH POSTINFARCTON LEFT VENTRICLE ANEURYSM

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AIM: to analyze kidney function of cardiac surgery patients with postinfarction left ventricle aneurysms (LVA).

METHODS: retrospective analysis of random 110 cardiac surgery patients with postinfarction LVA. ECG, ECHO, perioperative evaluation of kidney function with calculation of glomerular filtration rate (GFR), coronary angiography, CABG with LVA resection on pump were performed for all patients.

RESULTS: disorders of glucose metabolism had 81 (73.59%) patients, chronic obstructive pulmonary disease - 82 (74.5%) and chronic kidney disease (CKD) 3-5 stage - 38 (34.5%). Preoperative risk stratification with EuroScore II scale was 9.4%. All operations performed on pump with Custodiol cardioplegia in 53 (48.1%) cases. The average perfusion time was 111 min; average crossclamping time was 73.9 min. All pts underwent LVA resection with thrombectomy in 57 cases. Correction of mitral insufficiency had 11 patients, tricuspid valve repair - 4, ventricular septal rupture repair - 2. The average number of grafts - 2.7, the internal thoracic artery was used in 18 (16.3%) patients. Perioperative average levels of serum creatinine (sCr), glucose and hemoglobin presented in table 1. Acute kidney injury in the early postoperative period had 9 (8.1%) patients.

CONCLUSIONS: At the admittance 38 (34.5%) patients with LVA had CKD. Analysis of the GFR dynamic in the early postoperative period showed a decrease of GFR in 71.05% of cases. Transient acute kidney injury with 50% sCr growth occurred in 9 (8.1%) cases but didn't require hemodialysis due to timely correction of drug therapy.

Table 1.
The average levels of serum creatinine, glucose and hemoglobin in the perioperative period, n-110 (M±m)

Average levels	On admission	1st postoperative day	At discharge
Serum creatinine, umol/L	108.3±26.3	126.2±38.9	106.2±33.3
Glucose, mmol/L	6.7±2.2	10.7±3.1	6.3±1.9
Hemoglobin, g/L	141±21.3	108±19.6	116±15.3

FREQUENCY AND OUTCOMES OF ELEVATED PREOPERATIVE GLYCOSYLATED HAEMOGLOBIN IN DIABETIC PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Background-Aim: Diabetes mellitus is an important risk factor for coronary artery disease. It is a major health problem in Pakistan and worldwide with an alarming increase each year. Its prevalence increased from 11.77% in 2016 to 26.7% in 2022. HbA1c is the main predictor of diabetic control. Level more than 7% shows poor control. This study was conducted to know the magnitude of these patients and its effects on their postoperative outcome. Our aim was to determine the frequency of elevated HbA1c levels among diabetic patients scheduled for coronary artery bypass surgery and to know outcomes in these patients.

Methods: This cross sectional study was performed from 29 Feb 2024 30 Aug 2024 in Department of Cardiac Surgery, Peshawar Institute of Cardiology. A total of 126 diabetic patients who were planned for On pump or Off pump CABG were included. Valvular and combined CABG+ Valve cases were excluded.HbA1c within 1 month of surgery was accepted. The procedure (Coronary artery bypass grafting) was performed by expert consultant cardiac surgeons. After the procedure the patients were shifted to cardiac intensive care unit and subsequently to ward for follow up. Patients were followed during this period to observe these outcomes and record them on Proforma.

Results: Our study shows that 30(24%) patients were in age 25-50 years and 96(76%) patients were in age 51-80 years. Mean age was 56 years with SD ± 9.11. 88(70%) patients were male and 38(30%) patients were female. More over 82(65%) patients had elevated HbA1c levels in which 2(2.4%) patient had stroke, 2(2.4%) patients had renal failure, 11(13.4%) patients had wound infection, 2(2.4%) patients had prolonged mechanical ventilation, 1(1.2%) patients had sepsis, 5 (6.1%) patients had atrial fibrillation.

Conclusions: We conclude that most patients undergoing CABG have poor diabetic control. The rate of sternal wound infection is also significantly higher in these patients.

CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION

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Introduction/background: Coronary artery bypass grafting, a medical procedure has been utilized widely for the therapy of patients with coronary artery disease. It is notable that patients with compromised left ventricular function and with low ejection fraction (EF) have low survival rates.

Objective: To determine the outcomes of patients undergoing coronary artery bypass grafting having reduced ejection fraction.

Study Design: Retrospective observational study.
Setting: Peshawar institute of cardiology.
Period: August 2021 to May 2022.

Material & Methods: We included a number of (n=120) patients who were undergone for CABG with mild to severe left ventricular dysfunction. Data was extracted from electronic medical record (EMR) and entered in SPSS version 25.00. Ethical approval was taken from hospital ethical review board committee.

Results: Mean age of patients were (57.40±9.311), mean cross clamp time (71.88±26.765) mean bypass time (109.77±43.763), mean hospital stay (4.63±.879) and mean ICU stays (41.60±16.385). 46.7% patients were in CCS III, 41.7% CCS II and 6.7% in CCS IV. In NYHA class 43% were with NYHA II & III and 6.7% with NYHA IV. 21.7% patients were with mild LV dysfunction, 43.3% with moderate and 35% severe LV dysfunction. Association of left ventricular dysfunction towards post-operative outcomes and clinical history has significant association at $p < 0.05$.

Conclusion: Coronary artery bypasses grafting extensively used for the treatment of patients with left ventricular dysfunction. Although medical management are also widely use and acceptable for moderate to severe LV dysfunction. Our study suggested that left ventricular dysfunction are strongly associated with post-operative out comes and clinical presentations.

Key words: Coronary Artery bypass grafting, Coronary artery disease, Left ventricular dysfunction, Ejection Fraction

THE EXISTENCE OF AN "ABNORMAL" LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY (ALCAPA) IN ADULTS

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Objective: To examine a rare and "late" diagnosis of anomalous left coronary artery from the pulmonary artery (ALCAPA) in adult patients and the challenges faced by vascular surgeons in its management, as well as the surgical strategy for correcting the condition.

Material- Methods: All data were retrieved from medical databases such as Pub med, Scopus, Cochrane etc.

Results: ALCAPA is a rare condition that is usually diagnosed early due to severe ischemia and high mortality in infancy. In surviving adults, the condition is often recognized late, resulting in the development of a strong collateral circulation that compensates for the reduced perfusion. Vascular surgeons face significant challenges, such as the anatomical complexity due to the dense reticular vascular area in the aortic root and inferior fundus, making access and surgical repair difficult. Preservation of collateral circulation requires careful planning to avoid sudden myocardial ischemia. Combined coronary bypass grafting, although effective, does not completely eliminate the anomaly of the left coronary artery-aortic connection.

Conclusions: Late diagnosis of ALCAPA in adults poses particular surgical difficulties due to the anatomical complexity and risks associated with preservation of collateral circulation. The surgical strategy requires an individualized approach and often multidisciplinary collaboration, as well as careful perfusion management to avoid ischemia

RECURRENT ACUTE CORONARY SYNDROME IN A HIGH-RISK ELDERLY PATIENT: A CASE REPORT

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Semmelweis University, Budapest, Hungary

Background: Acute coronary syndrome (ACS) is a major cause of morbidity and mortality among elderly patients, especially those with multiple cardiovascular risk factors. Prompt diagnosis and intervention are essential, even in cases lacking ST-segment elevation.

Case Presentation: We report a 72-year-old woman with hypertension, obesity, and a 30-pack-year smoking history who presented with recurrent retrosternal chest pain despite optimal medical therapy. ECG showed deep ST-segment depression in leads V4-V6, and troponin T was elevated. Coronary angiography revealed total occlusion of the circumflex artery with collateral circulation. Percutaneous coronary intervention (PCI) with drug-eluting stent placement was performed, leading to complete symptom resolution. The patient remained stable on follow-up with guideline-directed medical therapy.

Discussion: This case highlights the importance of aggressive risk stratification and early revascularization in high-risk elderly patients with ACS. Despite the absence of ST-segment elevation, the presence of ECG changes and biomarker elevation warranted urgent PCI. Medical management alone may be insufficient in such patients.

Conclusion: Early recognition and timely intervention are essential in high-risk ACS patients, even in the absence of ST elevation. This case underscores the need for individualized management strategies to optimize patient outcomes.

Clinical Learning Point: High-risk elderly ACS patients with ischemic ECG changes and biomarker elevation should be considered for early PCI, as medical therapy alone may not prevent recurrent ischemic events.

Keywords: Acute coronary syndrome, elderly, non-ST elevation MI, percutaneous coronary intervention, risk factor management, hypertension, obesity, smoking

Background: Acute coronary syndrome (ACS) remains a significant cause of morbidity and mortality worldwide, particularly among elderly patients with multiple cardiovascular risk factors [1]. Despite medical advancements, NSTEMI often poses diagnostic challenges due to its variable presentation and subtle ECG findings [2]. Elderly patients are particularly prone to atypical symptoms, delayed presentation, and increased comorbidities, complicating timely diagnosis and management [3].

According to the ESC and AHA guidelines, early risk stratification and intervention are essential in ACS patients with high-risk features, even in the absence of ST elevation [1,2]. Revascularization strategies, particularly PCI with drug-eluting stents, have been shown to significantly reduce cardiovascular morbidity and mortality [3]. This case highlights the importance of early invasive management in an elderly patient with recurrent ischemic chest

pain despite optimal medical therapy, reinforcing the need for an aggressive approach in high-risk ACS patients.

Case Report: A 72-year-old woman was referred to our institution with recurrent episodes of retrosternal chest pain persisting for several weeks. The pain was described as pressure-like, radiating to the left arm, and worsened with physical exertion. Despite being on a comprehensive antianginal regimen, including beta-blockers, calcium channel blockers, and nitrates, she continued to experience symptoms.

Her past medical history included long-standing hypertension (20 years), obesity (BMI: 32 kg/m²), and a 30-pack-year smoking history, although she had quit smoking a decade ago. Initial assessment at the referring hospital revealed an elevated Troponin T level (0.45 ng/mL, normal <0.01 ng/mL) and deep ST-segment depression in leads V4-V6 on ECG [Figure 1], raising suspicion for high-risk ACS [2]. Transthoracic echocardiography showed a preserved left ventricular ejection fraction (55%) with mild lateral wall hypokinesis.

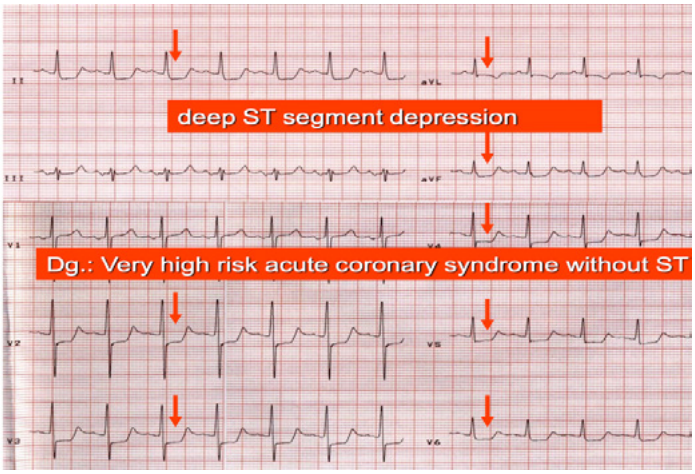

Fig 1: Patient ECG

Given her persistent symptoms and high-risk profile, she was transferred to our facility for further management. Coronary angiography revealed a total occlusion of the circumflex (CX) artery with collateral circulation from the right coronary artery. No significant stenosis was identified in the left anterior descending (LAD) or right coronary arteries. Urgent percutaneous coronary intervention (PCI) was performed [Figure 2], and a drug-eluting stent was successfully implanted in the CX artery, achieving full revascularization. Post-procedure, the patient experienced complete symptom relief.
She was discharged on dual antiplatelet therapy (aspirin and clopidogrel), a high-intensity statin, and continued antianginal therapy. Two days later, she returned to the referring hospital for follow-up and remained asymptomatic.

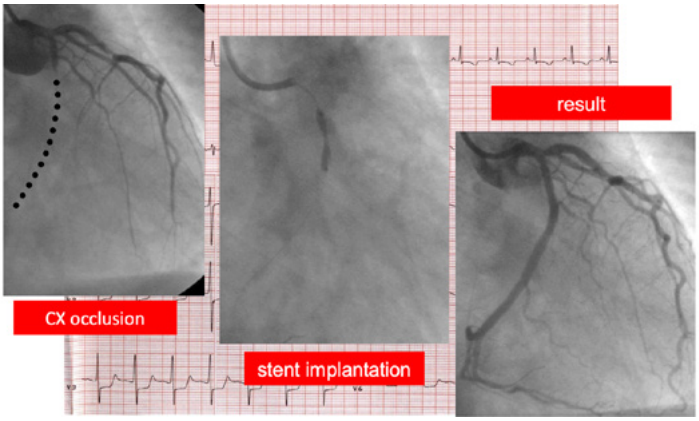

Fig 2: PCI

Discussion: This case underscores the importance of early recognition and intervention in elderly patients with high-risk ACS. The persistence of ischemic symptoms despite optimal medical therapy highlights the limitations of pharmacologic management alone [3]. The patient's history of hypertension, obesity, and past smoking significantly contributed to the development of coronary artery disease (CAD), ultimately leading to ACS.

Current ESC 2020 and AHA 2021 guidelines emphasize early risk stratification and urgent revascularization in patients with ischemic ECG changes and elevated biomarkers, even in the absence of ST-segment elevation [1,2]. In this case, the presence of ST-segment depression and elevated troponin levels warranted an invasive approach. PCI with drug-eluting stent placement effectively restored coronary perfusion, preventing further myocardial injury.
Beyond procedural success, aggressive secondary prevention is essential in elderly ACS patients [3]. Risk factor modification—including smoking cessation, weight control, and blood pressure management—is critical for reducing recurrent cardiovascular events. Adherence to dual antiplatelet therapy and lipid-lowering agents also plays a crucial role in preventing future ischemic episodes.

Conclusions: This case highlights the importance of early risk stratification and timely intervention in high-risk ACS patients, particularly those with multiple cardiovascular risk factors. Despite the absence of ST-segment elevation, the ischemic ECG changes and biomarker elevation warranted urgent PCI, leading to symptom resolution and improved prognosis. Long-term risk factor modification and adherence to guideline-directed medical therapy are critical in optimizing patient outcomes and preventing recurrent ischemic events.

Declarations

Ethics approval and consent to participate: This case report is exempt from IRB approval as per the policies as it involves retrospective analysis of anonymized patient data and does not constitute human subject's research. Written informed consent was obtained from the patient.

Consent for publication: Written informed consent was obtained from the patient for the publication of this case report any accompanying images.
Availability of data and materials: Data sharing does not apply to this article as no datasets were generated or analyzed during the current study.
Competing interests: The authors declare that they have no competing interests.
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Authors' contributions: All authors have participated directly in the planning and execution of the work and have approved the final version of the manuscript.
Acknowledgments: Figure 1,2: Department of Cardiology, Semmelweis University, Budapest, Hungary
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Friday May 16,2025
Conference Room 2
16.00 - 17.00

COMPLEX ENDOVASCULAR REPAIR FOR FAILED-EVAR; MIDTERM OUTCOMES

Konstantinos Tzimkas-Dakis[1], Konstantinos Spanos[1], George Kouvelos[1], Aikaterini Bouzia[2], Athanasios Chaidoulis[1], Christos Karathanos[1], Eleni Arnaoutoglou[2], Athanasios Giannoukas[1], Miltiadis Matsagkas[1]

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Background-Aim: Late failure of endovascular aortic aneurysm repair (failed-EVAR) has shown to be increasing over the last years. Failed-EVAR could lead to aneurysm sac expansion and increased risk of rupture. While open surgical conversion with previous endograft explantation provides a durable repair, it is often associated with high perioperative morbidity and mortality. Endovascular repair of failed-EVAR with proximal sealing extension in healthy, supravisceral aortic segments is associated, while technically demanding, with good short-term outcomes. However, extended follow-up is confined. We aim to present the midterm outcomes of complex endovascular repair for failed, non-infectious EVAR.

Methods: A single tertiary centre, retrospective analysis of prospectively collected data was undertaken. All consecutive patients treated with endovascular means for failed, non-infectious EVAR from 2016 to 2025 were included. Patients' demographic characteristics, aneurysm type, clinical presentation, cause of failure, prior supra- or infrarenal sealing and incorporated target vessels (TV) were collected and analysed. Perioperative (30-day) outcomes included technical success, overall survival, reintervention and spinal cord ischemia. Midterm outcomes included overall survival, freedom from reintervention and freedom from EL estimates using Kaplan-Meier lifetables.

Results: A total of 30 patients (all male, mean age: 73 years old) with a mean aneurysm diameter of 9.2cm were included in the analysis. Twenty (66.6%) were asymptomatic, while three patients presented with a ruptured AAA. Failed-EVAR causes included 23 (76.6%) endoleak Ia. A total of 96 targetbvesels (TV) were revascularized. Most aneurysms were juxtarenal (33.3%) or pararenal (36.6%). Fenestrated (FEVAR) endovascular repair was the most common modality (56.6%). Technical success and thirty-day survival was 100%, with no need for any reintervention. Spinal cord ischemia rate was 3.3% (one case, ruptured pararenal AAA). Median follow-up was 24 (1-33) months. Overall survival estimate was 74% (SE 9.5%) at 24 months, with no aorta-related mortality events. Freedom from reintervention estimates was 91% (SE 6%) at 6 months. Freedom from EL estimate was 91% (SE 6%) at 6 months.

Conclusions: Complex endovascular repair of failed-EVAR is a feasible alternative solution to open aortic repair, with excellent perioperative outcomes and acceptable midterm sur-

vival outcomes. EL and reintervention rates were low, with all of them being endovascular and minimally invasive. Longterm outcomes are warranted for evaluating the durability of endovascular repair in failed-EVAR.

ENDOVASCULAR TREATMENT OF ABDOMINAL AORTIC ANEURYSM WITH ENDOSTAPLER IMPLANTATION

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Introduction: Endovascular treatment of abdominal aortic aneurysm (AAA) with a hostile, short-neck is a challenge due to risk of endoleak type IA or proximal stent graft migration. One of the available solutions we have for the treatment of hostile neck AAA is EndoSuture aneurysm repair (ESAR).

Aim of this paper is to present initial experience with ESAR method in the armamentarium of tertiary vascular center.

Methods: This is a retrospective, single-center study analyzing medical data from patients treated with ESAR for AAA at our center between 2020 and 2024. Medical data were gathered from patient histories, including comorbidities, information about anatomical and morphological characteristics of AAA seen on MSCT angiography examinations, demographic details and outcomes. Briefly our protocol in treatment of AAA consider open repair as a first choice in a good risk candidate, patients at high risk are considered for endovascular repair while those with hostile neck are considered for parallel stent graft, open repair and ESAR individually balancing between advantages and disadvantages of each method.

Results: From 2020 to 2024, a total of 20 patients with AAA were treated with ESAR, with a mean age of 68 ± 14 years, of which 19 (95%) were male patients. In 15 (75%) cases, patients did not experience any complications caused by the treatment during the follow-up period, with properly positioned stent grafts and no signs of endoleak verified by CT scan. Endoleak type II was noted in 3 (15%) patients. Rupture of the AAA after the ESAR procedure was noted in one patient however due to type Ib endoleak. Additionally, leg ischemia due to limb graft occlusion was observed once (5%). In one case, redo operation (ESAR) was performed, due to endoleak type V after EVAR procedure.

Conclusion: EndoSuture aneurysm repair can be one of the modern solutions option in patients with complex and hostile neck anatomy of AAA. Future follow up and other studies will show benefit of this methods and narrow selection criteria for most effective treatment.

A SINGLE-CENTER EXPERIENCE ON ENDOVASCULAR REPAIR IN PATIENTS MANAGED FOR COMPLEX AORTIC ANEURYSMS

Konstantinos Tzimkas-Dakis[1], George Kouvelos[1], Konstantinos Spanos[1], Petroula Nana[1], Metaxia Bareka[2], Athanasios Chaidoulis[1], Christos Karathanos[1], George Volakakis[1], Konstantinos Batzalexis[1], Eleni Arnaoutoglou[2], Athanasios Giannoukas[1], Miltiadis Matsagkas[1]

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[2] Department of Anesthesiology, Larissa University Hospital, Faculty of Medicine, University of Thessaly, Larissa, Greece

Background: Complex endovascular aortic repair has become increasingly popular in aortic aneurysm management due to the associated lower early morbidity and mortality compared to open repair. The aim of this analysis was to present the early and follow-up outcomes in patients managed for aortic aneurysms using complex endovascular procedures.

Methods: A retrospective analysis of consecutive patients who underwent complex endovascular aortic aneurysm repair using fenestrated and branched endografts as well as the chimney technique from June 1st, 2016, to February 28th, 2025, in a single centre was conducted following the STROBE guidelines. Device configuration and bridging stent selection relied on patient's anatomy, availability of materials and setting of repairs. Primary outcomes included technical success, mortality and spinal cord ischemia (SCI) at 30 days. Midterm outcomes included survival, freedom from re-intervention and freedom from target vessel occlusion.

Results: In total, 191 patients underwent complex procedures; mean age 71±6.8 years and 182 (95.3%) males. Among patients, 162 (84.8%) were elective, 14 (7.3%) symptomatic and 15 (7.9%) presented with an aortic rupture. Regarding the extend of the disease, 59 (30.9%) and 80 (41.9%) patients were managed for juxta- and para-renal aneurysms, respectively, while the remaining 52 (27.2%) patients were treated for thoracoabdominal aneurysms [Type I: 1 (0.5%); Type II: 16 (8.4%); Type III: 11 (5.8%) and Type IV: 23 (12.0%)]. Seventy-seven (40.3%) patients were managed with the chimney technique, 46 (24.1%) using fenestrated and 69 (36.1%) using branched devices. In total, 566 target vessels were revascularized including 163 right renal and 176 left renal arteries, 132 superior mesenteric arteries, 93 celiac trunks and one hepatic and one splenic artery in a patient with anatomic variation. Technical success was 94.8% (3 failures). The 30-day mortality was 6.8% (13 patients); 4.7% in elective cases. The SCI rate was 3.1% (6 patients); 2% (4 patients) had permanent Grade 3 SCI. All SCI events were recorded in patients with thoracoabdominal aneurysms. The estimated survival was 80.0% (standard error (SE): 3.3%) at 36 months, with no further death recorded during follow-up. The freedom from reintervention was 91% (SE 2.7%) at 48 months. The estimated freedom from target vessel occlusion was 90.0% (SE 3.1%) at 48 months.

Conclusion: Complex endovascular repair was related with acceptable mortality in a cohort including aortic ruptures. SCI rate was 3% and related mainly to the extent of the disease. Reinterventions may be needed, and close follow-up is mandatory.

COVERED ENDOVASCULAR RECONSTRUCTION OF ILIAC BIFURCATION TECHNIQUE - CERIB

Athanasios Haidoulis[1], Kostantinos Spanos[1], George Kouvelos[1], Konstantinos Dakis[1], Alexandros Barbatis[1], Dimitra Papaspyrou[2], Elena Arnaoutoglou[2], Athanasios Giannoukas[1], Miltiadis Matsagkas[1]

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Backround-Aim: Distal landing zone in iliac arteries represents an important issue during endovascular repair of abdominal aortic aneurysms (EVAR). The aim of this study is to present a case series for landing in the external iliac artery (EIA) during EVAR, while preserving blood flow in the IIA with Covered Endovascular Reconstruction of the Iliac Bifurcation (CERIB) technique.

Methods: This is a single center, retrospective analysis of prospectively collected data of patients that underwent EVAR either for intact AAA or previous failed EVAR from December 2022 up to January 2025. Indications for treatment were presence of common iliac artery aneurysm (CIAA), short CIA or endoleak type Ib (EIb). For the distal sealing zone, we used balloon expandable covered stent (BXCS). Primary outcomes were technical success, and overall patency rate. Secondary outcomes were gutter endoleak and re-intervention rate.

Results: 42 patients were included in the study being treated with 54 CERIB.

Seven patients had a previous failed EVAR, while three patients were treated urgently for a symptomatic para-renal aneurysm. The treatment indications were endoleak type Ib, short CIA, and CIA aneurysm. Platforms for the proximal iliac component used were the Cook Zenith Alpha (22 limbs), Gore Excluder (12 limbs), Endurant IIs (15 limbs), Ovation Alto (1 limb), Artivion (1 limb). Technical success was 100% with no adjunctive procedure. No death was recorded for all patients. The patency rate was 100% at first month CTA (54/54), at 3-months (17/17) at 6 months (15/15), at 1-year (14/14) and 2-years (5/5). One patient underwent reintervention for stent stenosis and one patient for gutter ET in the area of the CERIB.

Conclusions: The CERIB technique seems to be effective and safe according to mid period results. It is suitable with a variety of commercial endograft platforms. It may be a valuable alternative to iliac branch devices when there are anatomical considerations. Longer follow up is needed to conclude for long term patency and durability.

EARLY OUTCOMES FROM THE USE OF THE NEW OVATION ALTO STENT GRAFT IN THE TREATMENT OF ABDOMINAL AORTIC ANEURYSM: RESULTS FROM THE HELLENIC REGISTRY

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Introduction: Ovation Alto endograft received CE Mark approval in August 2020 with main characteristic the requirement to have a proximal aortic landing zone of 7mm below the inferior renal artery for sealing. This study presents the early outcomes of Ovation Alto platform from the Hellenic Registry in patients with abdominal aortic aneurysm (AAA).

Methods: Hellenic Registry includes both retrospectively and prospectively collected patients receiving the Ovation Alto™ Abdominal Stent Graft System (NCT05172830). All patients were treated for an elective or symptomatic infrarenal AAA from 2021 to 2023. No ruptures were included. Preoperative and postoperative anatomic characteristics of the aneurysm (and infra-renal aortic diameter at 7mm and 10mm from the lower renal artery, aneurysm diameter, neck angle) were recorded. Outcomes were defined as technical success, and 30-day survival, re-intervention and endoleak types.

Results: One hundred and twenty-eight patients (96% males, mean age 71.6±7, mean AAA diameter 59.8±10mm) were included. Most patients were asymptomatic (94%). The mean aortic neck diameter at 7mm was 23±3mm, the mean aortic neck length was 18±9mm and the mean aortic neck angulation was 28±14°. Nineteen patients had <10mm of neck length and fourteen had a bifurcation diameter of <20mm. Fifty-eight (45%) patients had at least one external iliac artery of <7mm. Over half of the patients (55%) were treated under general anesthesia. Technical success was 98%; 2 patients were converted to aorto-uni-iliac with fem-fem bypass intra-operatively. In 6 patients balloon or self-expandable stent were implanted for relining intra-operatively. The mean procedure time was 129±60 minutes, the mean contrast volume used was 130±50 mL, and the median radiation time was 27±18 minutes. No intra-operative high flow endoleaks were detected. The mean hospital days were 2.5±1.5. At 30 day follow up, the mean sac aneurysm diameter was 58±11mm. In most patients the sac aneurysm diameter was stable (59%) or decreased (29%). No limb occlusion was reported, while 1 death due to cancer and 1 open conversion were also reported. Endoleak type II rate was 26%, while endoleak type I rate was 1.5%.

Conclusion: Ovation Alto stent graft demonstrated high early technical and clinical success rates. Patients with anatomical restrictions such as short aortic neck, narrow iliac bifurca-

tion and narrow external iliac artery can be successfully treated.

COMPARISON OF THREE TECHNIQUES - DEVICES FOR THE PRESERVATION OF INTERNAL ILIAC ARTERY

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Introduction: The preservation of blood flow in the internal iliac arteries (IIAs) and their branches during aortoiliac and iliac aneurysm repair is crucial in preventing complications associated with IIA occlusion during endovascular aneurysm repair (EVAR). Various endovascular techniques have been developed to achieve this goal. This study aims to evaluate the early and mid-term outcomes of aortoiliac and iliac aneurysm repair using several techniques and devices, assessing their efficacy in maintaining pelvic perfusion.

Methods: A single-center, retrospective study of prospectively collected data was conducted. Patients undergoing endovascular repair with the Zenith Cook Branch Iliac Stent (ZBIS) device (Cook Medical, Bloomington, Indiana, USA), GORE Excluder Iliac Branch Endoprosthesis (IBE) (W.L. Gore & Associates, Flagstaff, Arizona, USA), or Covered Endovascular Reconstruction of the Iliac Bifurcation (CERIB) technique between May 2017 and September 2024 were included. Baseline demographics, intraoperative details, and perioperative outcomes were recorded. Primary endpoints included technical success, primary patency, freedom from endoleak Ib, and the need for reintervention.

Results: A total of 91 patients (90 males; mean age 71.6 ± 3.9 years) underwent flow-preserving endovascular procedures, involving 109 iliac artery bifurcations. Specifically, 34 patients (33 males; mean age 70.2 ± 6.7 years) received 39 IBDs, with five undergoing bilateral implantation. Additionally, 15 patients (all males; mean age 77.5 ± 2.2 years) received IBE, including one bilateral case. Lastly, 42 patients (41 males; mean age 67 ± 2.8 years) underwent 54 CERIB procedures, with 12 bilateral cases. Technical success rates were 97.5% for IBD, 94% for IBE, and 100% for CERIB, yielding an overall success rate of 98.2%.

The overall primary patency was 95.8% at 1st month, 93.3% at 6 months, and 90.8% at 12 months. IBD patency rates were 94%, 86%, and 78% at these intervals, while IBE maintained a consistent 83.3%. CERIB achieved 100% patency throughout follow-up, showing statistical significance (p=0.05). Total freedom from endoleak type Ib was 99% at 1 month and 92% at 6 months. Total freedom from reintervention was 95.8%, 91%, and 88.3% at 1, 6, and 12 months, respectively.

Conclusion: Endovascular aneurysm repair using the CERIB, IBD, and IBE techniques are all effective and safe approaches, with low reintervention rates. However, in terms of patency, CERIB demonstrated better outcomes among the three techniques during the first post-op year of follow-up.

ENDOVASCULAR TREATMENT OF RUPTURED AORTIC ANEURYSMS USING THE CHIMNEY TECHNIQUE

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Aim: Chimney endovascular abdominal aneurysm repair (chEVAR) is one of the treatment options for ruptured juxta- and pararenal abdominal aortic aneurysms (rAAA), especially when custom-made grafts are unavailable. The aim of this analysis is to present a single tertiary center experience of rAAA endovascular repair using the chimney technique.

Methods: A retrospective analysis of prospectively collected data from a single tertiary center, including all patients with ruptured juxta and pararenal abdominal aortic aneurysms treated endovascularly using the chimney technique from 2019 to 2024, was conducted. The primary outcomes were 30day mortality, technical success, and reintervention.

Results: Eleven patients were treated with the chimney technique in an emergency setting, due to ruptured juxta- and pararenal abdominal aortic aneurysms and were included in this study. The mean age was 69.7 ± 8.7 years and 90.9% were males (10/11 pts). The mean rAAA diameter was 81.7±33.3mm. Four (36.4%) patients were managed for a juxtarenal aneurysm and seven (63.6%) for a pararenal aneurysm. Five patients had previous EVAR and type Ia endoleak. All patients were managed with bifurcated devices and the grafts used for the visceral arteries were balloon expandable covered stents, either Begraft or VBX. Regarding the number of parallel grafts, one patient received a single chimney, seven patients received double chimneys, and three patients triple chimneys. Technical success was 90.9%. No reintervation was needed. The 30-day mortality rate was 27.3% (3 deaths/11 patients), and none of those deaths occurred intraoperatively. The mean follow up was 17 ± 15 months. After excluding the patients that died within the initial 30 days, at 2 years follow up the mortality rate was 12.5% (one non-aneurysm related death occurred). During follow up neither endoleak, nor parallel graft occlusion was detected.

Conclusion: Endovascular repair for rAAA using the chimney technique provided high technical success and low reintervention rate, while the early mortality rates were also acceptable.

COVERED ENDOVASCULAR RECONSTRUCTION OF INTERNAL ILIAC BIFURCATION TECHNIQUE - CERIIB

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Background-Aim: Treatment of IIAA is challenging. In many cases, open surgical repair of IIAA poses difficulties due to their deep pelvic localization and, in case of previous open repair of AAA scar tissue may be present. According to the literature, 30-day mortality and complication-rate reach up to 10% and 16%, respectively. Thus, with the EVAR becoming the first choice of AAA treatment, endovascular techniques have been also applied for the IIAA treatment. The usual approach is the exclusion of the proximal part of the IIA orifice by deploying a stent graft along the common and external iliac arteries with or without coil embolization of the outflow branches and the IIAA sac itself. The main issue of those endovascular techniques is that either unilateral or bilateral IIA occlusion has been shown to carry a risk of significant ischemic complications in nearly one quarter of patients. Especially bilateral IIA occlusion has been related to a significantly higher rate of buttock claudication and even serious ischemic complications regarding the rectum and buttocks. Endovascular techniques have evolved to side branch techniques preserving IIA patency leading to a significant improvement in the treatment of aorto-iliac aneurysms and have been associated with high technical success and low morbidity.

Method: A case series of 6 patients that had either unilateral or bilateral IIAAs using an off-the-shelf technique of Covered Endovascular Reconstruction of Internal Iliac Bifurcation (CERIIB).

Results: From 11/22 to 01/25 6 patients underwent surgery with 7 CERIB, one bilateral. 5 of them also had CERIB for CIAA's at the same operation. All operations were performed under general anesthesia. Average age of the patients was 66y.o. (57 to 75), all males. In all of them GORE VBX covered balloon expandable stents were used, both in IIA and the IIA branches. Technical success was 100% with no adjunctive procedure. No death was recorded for all patients. The patency rate was 100% at first month CTA (6/6), at 3-months (2/2) and 2-year (1/1). One patient underwent reintervention for stent stenosis

Conclusions: The CERIIB technique seems to be effective and safe according to mid period results. It may be a valuable alternative to open repair as well as IIA occlusion and embolization as it preserves the blood flow to internal iliac artery branches avoiding the various complications. Higher number of patients with longer follow up is needed to conclude for safety, long term patency and durability.

A META-ANALYSIS OF PERIOPERATIVE PATIENT RADIATION DOSE ON ENDOVASCULAR ABDOMINAL AND THORACOABDOMINAL AORTIC ANEURYSM REPAIR INTERVENTIONS

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Background-Aim: The intricacy of fenestrated and branched endografts (F/BEVAR) has been correlated with a notably extended procedural duration in comparison to standard endovascular aneurysm repair (EVAR). These sophisticated interventions are heavily dependent on fluoroscopic imaging, which consequently results in increased radiation exposure for both patients and practitioners. In light of the potential hazards linked to elevated radiation levels, this meta-analysis sought to evaluate and compare radiation exposure between EVAR and F/BEVAR as well as examine the temporal trends.

Methods: Two independent reviewers utilized Mendeley reference manager to analyze papers from the MEDLINE, Cochrane Library, and Scopus databases throughout a seven-year period. A PRISMA-compliant meta-analysis was undertaken utilizing the medical subject headings (MeSH) phrases “AAA,” “aortic aneurysm,” and “radiation” to search and index journal articles systematically. We only considered full-text, English-language papers that reported radiation data on individuals treated with conventional EVAR or F/BEVAR. The SPSS statistical program was used to create regression lines for fluoroscopy time (FT), kerma-area product (KAP), and cumulative air kerma (CAK). The STATA statistical program was used to conduct the meta-analysis and display the forest plots.

Results: In this meta-analysis of seventy-two articles encompassing ninety-two studies on EVAR and F/BEVAR, indicated that standard EVAR exhibited significantly lower pooled mean values for FT (26.05 vs. 77.51 min; $p<0.001$), KAP (131.34 vs. 209.50 Gy·cm^2; $p=0.010$), and CAK (806.76 vs. 2798.61 mGy; $p<0.001$), corresponding to increases of 197.5%, 59.5%, and 246.9% respectively for F/BEVAR; furthermore, aside from a notable rise in KAP during F/BEVAR procedures ($r=0.531$, $p=0.028$), all parameters exhibited a declining trend over time for both techniques.

Conclusions: The significant increase in radiation exposure linked with F/BEVAR as compared to standard EVAR is emphasized in this meta-analysis. For both approaches reflecting developments in imaging technology and operator expertise, our results also imply a declining trend in radiation parameters over time. Regardless, the significant radiation burden connected with F/BEVAR emphasizes the necessity of ongoing dose optimization initiatives including better procedural methods, optimized imaging techniques, and improved protective measures to decrease radiation exposure for both operators and patients.

UPPER EXTREMITY ACCESS FOR VARIOUS ENDOVASCULAR PROCEDURES. IS IT SAFE?

Alexandros Barbatis, Konstantinos Spanos, Konstantinos Dakis, Christos Karathanos, Georgios Kouvelos, Georgios Volakakis, Konstantinos Batzalexis[1], Athanasios Chaidoulis, Athanasios Giannoukas, Miltiadis Matsagkas

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Introduction: Upper extremity access (UEA) is used more frequently in current practice for endovascular interventions, including both cutdown and percutaneous approaches. This study aims to evaluate the outcomes of UEA in various advanced endovascular procedures.

Methods: A single-center, retrospective study of prospectively collected data was conducted. All consecutive patients who underwent endovascular procedures involving upper extremity access (UEA) including fenestrated and branched endovascular aneurysm repair (F/BEVAR), endovascular arch repair, chimney endovascular aneurysm repair technique (CHEVAR), Covered Endovascular Reconstruction of the Iliac Bifurcation (CERIB), Covered Endovascular Reconstruction of the Internal Iliac Bifurcation (CERIIB) and transluminal angioplasty for various artery disease between May 2017 and December 2024 were included. Baseline characteristics, intraoperative details, and perioperative data were systematically gathered. Primary outcomes included technical success rate, periprocedural transient ischemic attack (TIA) or stroke incidence, reintervention rates, and access-related complications.

Results: A total of 257 patients including 298 access sites (96% male; mean age 73.2 ± 3.9 years) underwent UEA, with 28 requiring bilateral axillary access. In total, 298 upper access sites were recorded: 99 for ChEVAR, 64 for BEVAR, 45 for CERIB, 7 for aortic arch repair, 4 for CERIIB, 10 for second-stage BEVAR, 4 for FB- EVAR and 65 for transluminal angioplasty for various artery stenoses. Right-hand access was used in 31 cases, while 267 involved left-hand access. Ultrasound-guided percutaneous access was performed in 29% (85/298) of cases, while 71% (213/298) underwent surgical cutdown. No perioperative TIAs or strokes were observed. The reintervention rate was 1.3% (4/298) due to upper access complications, including two brachial artery injuries in which one requiring vein bypass and the other patch angioplasty, one arterial closure device failure necessitating patch angioplasty and one pseudoaneurysm managed also with patch angioplasty. Two cases of transient radial nerve paresis were recorded. Patency rate at 1st year of follow up was 100%. Sheath sizes ranged from 6 to 18 French.

Conclusion: Upper extremity access, whether performed via cutdown or percutaneous approach, is a safe and effective technique, demonstrating a low reintervention rate and minimal incidence of neurologic complications. Therefore, it can be used liberally during endovascular procedures.

Friday May 16,2025
Conference Room 1
17.30 - 19.30

SAFETY AND EFFICACY OF AORTIC VALVE REPAIR THROUGH MINIMALLY INVASIVE APPROACH

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Background- AIM. Advances in innovative techniques surgical treatment for the aortic valve have facilitated the development a new era. Although, the first description of aortic valve replacement through right thoracotomy was published in 1993 and popularized by Cleveland Clinic in 1996 and showed good results compared to complete sternotomy, today this method is becoming a primary one in reducing intraoperative and postoperative risks. We set out to examine the early results of our initial experience.

Metods. The study included 128 consecutive patients who were operated on between April 2014 and January 2025 in the International Hospital Medpark. The parameters analyzed were: age, sex, intraoperative aspects (type of minimally invasive incision, peripheral cannulation, duration of aortic clamp), postoperative evolution by evaluating safety, efficacy and ensuring a cosmetic scar.

Results. It was established that the average age of the patients in the study group was 61.4 years with a predominance of males (64.06%). The incision method was different: 74 cases upper J-sternotomy, 21 cases right anterior mini thoracotomy, 33 cases right lateral mini thoracotomy. Repair of the ascending aorta is also a challenge for minimally invasive cardiac surgery. Thus, we report 7 cases of ascending aorta repair through J-sternotomy, 3 cases through right anterior mini thoracotomy and 2 cases through right lateral mini thoracotomy. The average duration of surgical intervention was 4 h 42 min ± 12 min; average extracorporeal bypass time 75+/- 32 min; average cross-clamping time: 57 +/- 21 min. Normothermia was maintained during the intraoperative period. Post-operative echocardiography, the pressure gradient at the prosthesis level was within normal limits (average gradient 25.5 mmHg). The initial postoperative drainage volume at 24 hours averaged 182.6 ± 66.5 ml. Average duration of hospitalization was 5.8 days. There were no cases of reoperation due to postoperative bleeding or the need for permanent pacemaker implantation.

Conclusion. Our theories further establish the possibility of reducing invasiveness in aortic valve approach through minimally invasive incisions without compromising patient safety and clinical outcomes. This is true even during the learning curve of perfecting intraoperative technique.

THE FORECASTING "NEW" CARDIAC CONDUCTION DISTURBANCES AND THE RISK OF PACEMAKER IMPLANTATION AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT: MULTIVARIATE ANALYSIS

VALERIYA CHEKANOVA, Timur Imaev, Alexander Pevzner

National Medical Research Centre of Cardiology named after acad. E.I. Chazov, Moscow, Russia

Introduction:The number of transcatheter aortic valve replacement (TAVR) is growing every year. However, the leading complication still is cardiac conduction disturbances with possible need of pacemaker implantation.

Purpose of the study: To develop a multivariate model for predicting the risk of cardiac conduction disturbances and pacemaker implantation after TAVR on a "training" sample of patients and to assess the diagnostic accuracy of the developed model on a "control" sample of patients.

Material and methods: The study included 337 patients (237 patients in the "training" sample and 100-"control") with severe and critical aortic stenosis, who underwent TAVR at the Department of Cardiovascular Surgery, National Medical Research Center of Cardiology named after E.I. Chazov. Baseline cardiac conduction disturbances were detected in 65(27%) patients. 23(10%) had I-II degree atrioventricular block; 24(10%)-left bundle branch block (LBBB),11(5%)-right bundle branch block (RBBB); intraventricular conduction disturbances were recorded in 51(22%) patients. Self-expanding models of prostheses were mainly used for implantation 209(88%)- "CoreValve","Portico","AcurateNeo". The features that demonstrated statistically significant differences between the groups were included in a multivariate regression analysis. The model for predicting the risk of developing cardiac conduction disturbances after TAVR was registered on the "training" sample, as well as a model for predicting the implantation of a pacemaker in the early period. The diagnostic accuracy of the developed prediction model was assessed on the "control" sample.

Results: In constructing model of predicting new cardiac conduction disturbances after TAVR, the most significant predictors were the presence of initial intraventricularconduction disturbances, the size of the aortic root and the end-diastolic size of the left ventricle. The quality indicators of the model:AUC 0.711(95% CI:0.644-0.778), sensitivity 77.7%(95% CI:67.9-85.6), specificity 56.6%(95% CI:47.8-65.1), PPV 55.3%(95% CI:46.5-67.9), NPV 78.5%(95% CI:69.1-84.0). Results of testing on the "control" sample: AUC 0.723(95% CI:0.615-0.832). For the pacemaker implantation risk model, predictors were the presence of initial RBBB, coronary heart disease, and atrioventricular conduction disturbances. Model quality indicators: AUC 0.789(95% CI:0.683-0.894), sensitivity 94.1%(95% CI:71.3-99.8), specificity 53.9%(95% CI:47.0-60.7), PPV 13.8% (95% CI:10.8-87.0), NPV 99.2%(95% CI:94.7-99.4). Results of testing on the control sample: AUC 0.795(95%CI:0.664-0.925).

Conclusion: The proposed models for predicting "new" cardiac conduction disorders and the risk of pacemaker implantation worked stably on both samples, which indicates both

the relative homogeneity of the samples and the quality of the models. This can be used in clinical practice to assess the risk of developing cardiac conduction disorders and pacemaker implantation in patients who will undergo for TAVR.

NOVEL ATRIOVENTRICULAR VALVE ANNULOPLASTY SIZING METHOD: PRELIMINARY VALIDATION RESULTS FROM A CADAVER ANIMAL MODEL

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Background-Aim: A novel "paired-ring" mitral annuloplasty ring sizing device/technique was introduced at *AATS Mitral Conclave* as proof-of-concept and is now approved for first-in-human trial at our institution. This technique has the potential to dramatically improve ring selection by allowing the surgeon to predict/preview coaptation length (CL) prior to ring implantation. This study reports preliminary validation data derived from a swine cadaver heart model.

Methods: Cadaveric swine hearts (n=12) were used to validate sizer performance. An ink mark was placed on the anterior mitral leaflet as an initial reference point. Under saline distention, distance from the ink mark to the exact point of anterior leaflet coaptation was measured to establish a baseline point of reference. Paired-ring sizer was used to produce a moderate downsizing of the annulus. With saline distention, distance from the reference ink mark to the (new) point of anterior leaflet coaptation was measured under the temporary influence of the sizer (Figure). The difference between the two measurements represents the potential increase in CL as forecast by the sizer. The sizer was removed and a corresponding (size) Physio-2 ring implanted in standard fashion. "Predicted" and "actual" CLs were compared.

Results: A moderate increase in CL was achieved (2.0-5.5mm) in eleven hearts, and no change in one heart (because it was too small). Initial "predicted" CLs corresponded well (£0.5 mm difference) with final "actual" CLs in all 12 hearts (Table).

Conclusions: Functionality of a novel paired-ring mitral sizing method was validated using a cadaver swine heart model. CL changes predicted by the sizer corresponded accurately with CL produced by its corresponding commercially available annuloplasty ring implant.

SUTURELESS AORTIC VALVE REPLACEMENT IN HIGH RISK CONCOMITANT VALVULAR AND BYPASS SURGERY

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Objectives: Sutureless Aortic Valve Replacement (SU-AVR) has become an alternative to the standard one.

We aimed to: evaluate our experience with this valve in isolated high risk patients and when concomitant with other surgical cardiac procedure(s). Methods: Retrospective inclusion and analysis of all isolated high- risk patients underwent SU AVR and when concomitant with other valvular and/or CABG done in our SBCC center, From February 2013 to December 2023. Isolated simple low risk SU-AVR cases were excluded. The primary outcome will be 30-day mortality. The secondary outcomes will be early peri- operative complications, Hospital stay and 30d surgical re-admission. Intra-operative tips and tricks with a focus on the risk of paravalvular leak associated with native abnormal anatomy (Bicuspid/ quadri-

cuspid aortic valve) and with concomitant other valve surgery causing root asymmetry Results: Total of 70 high risk isolated and/or combined surgical patients were reviewed. Mean logistic Euro-Score of the study cohort was (11.3 +/- 5.6). Concomitant procedures consisted of mitral valve (n=39,55.71%) (repair n=14,20% and replacement n=25,35.71%), tricuspid valve repair (n=5, 7.14%), and cryoablation for atrial fibrillation (n =9,12.86%). CABG, performed in (n=42,70%). Mean Cardio-pulmonary By-paas Time (CPBT) and Cross Clamp Time (CCT) was (82.6 +/- 24.3min and 51.6 +/- 32.8 min) respectively. Median SU AV size was 25 mm (large size). Two patients (n=2,2.87%) had intraoperative supra-annular mal-positioning of the aortic prosthesis, which was safely removed and reimplanted in both cases. Three patients (n=3,4.28%) showed intra-operative <moderate paravalvular leak which improved in the 30d follow up. No 30d Mortality. Permanent Pace-Maker, PPM, Insertion in three patients (n=3, 4.28%)(n=1, 1.43% for Complete Heart Block, CHB, and n=2,2.87% for 2nd Degree HB). Normal Sinus Rhythm, NSR, was restored in (n=5/9, 55.56%) who underwent cryo-maze procedure. Hospital Stay (Range from 7 to 15 days, Mean of 9.1 +/- 5.6 days). No 30d surgical re-admision was recorded. Conclusions: SU-AVR is a technically feasible and safe procedure in isolated high risk patients and when combined with other valve +/- coronary by-pass grafting even in the setting of abnormal native aortic valve anatomy or aggressive pathology. It simplifies the surgical procedure and shortens the operative time.

THE IMPACT OF SAVR ON QUALITY OF LIFE: VALVE TYPE MATTERS

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Introduction: Aortic valve stenosis (AVS) is the most common valvular heart disease (VHD) and the onset of symptoms defects quality of life (QOL) of patients until aortic valve replacement (AVR). Surgical aortic valve replacement (SAVR) remains the first choice of therapy for many patients, particularly younger ones with low surgical risk. Selecting mechanical (MV) or biological valve (BV) prosthesis after SAVR yields conflicting findings regarding QOL improvement after SAVR.

Aim: To assess the effect of SAVR on QoL in patients with severe AVS at 1 year and to identify patient characteristics that may correlate with subjective assessment of QoL.

Methodology: 60 patients with severe AVS enrolled in our study (mean age 70±8.8, n=21 women). Clinical and QOL data collected pre-surgery and at 1 year postoperatively. For the assessment of QOL the SF-36 (36-Item Short Form Health Survey) questionnaire was used.

Results: Out of 60 patients, 26 received MV and 34 received BV. QoL is significantly improved 1 year after SAVR. The physical health score (PCS) was 58 ± 10% preoperatively and 80 ± 10% after 1 year ($p<0.001$). Similarly, mental health score (MCS) improved (55 ± 6% vs 77 ± 9%, $p<0.001$). PCS and MCS positively correlated with ejection fraction (EF, p=0,006, r=0,351 and p=0,009, r=0,333 respectively) and MCS was also positively correlated with aoric valve area (AVA, p=0,01, r=0,322). In patients with MV, MCS was negatively correlated with Vmax (p=0,04, r=-0,398) and positively correlated with valve orifice (p=0,04, r=0,400), whereas in patients with BV a positive correlation was found between EF and PCS (p=0,015 and r=0,414). In PCS, the results for EF improvement and better scoring of patients who received BV are independent of gender, age, BMI, and Euroscore II.

Conclusion: Patients with BV rated their physical condition highly positive. It could be said that this group of patients was not affected by the age factor but enjoyed the benefits of relief from valve load removal in conjunction with the non-prescribed use of anticoagulants and INR monitoring. The results could be useful when informing future patients in order to give them realistic expectations.

BRACHIAL-ANKLE PULSE WAVE VELOCITY IS ASSOCIATED WITH ACUTE KIDNEY INJURY IN PATIENTS UNDERGOING SURGICAL AORTIC VALVE REPLACEMENT

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Background/Introduction: Cardiac surgery-associated acute kidney injury (CSA-AKI) is a serious postoperative complication of cardiac surgery. Increased arterial stiffness has been shown to be an independent risk factor for cardiovascular events.

Purpose: We aimed to investigate whether arterial stiffness could be identified as a predictor of AKI in patients following surgical aortic valve replacement (SAVR).

Methods: Eighty-four patients (mean age 72±8 years, 34 females) with moderate to severe aortic stenosis undergoing SAVR were included. As indicators of arterial stiffness aortic hemodynamics (aortic pressures, aortic augmentation index [AIx@75], augmented pressure), carotid-femoral pulse wave velocity (cfPWV) and brachial-ankle pulse wave velocity (baPWV) were used. The measurements were conducted prior to surgery. Renal function was assessed by estimating glomerular filtration rate (eGFR) with the Cockcroft-Gault formula. Renal dysfunction was defined when eGFR was below 60 ml/min (n=28, 33%). AKI was defined using KDIQO criteria.

Results: Twelve patients (14%) developed AKI. There was no significant difference in the aortic hemodynamics and cfPWV between the two groups for AKI. baPWV significantly correlated with AKI (r = 0.313, P = 0.004). In backward logistic regression analysis, increase of baPWV per 1 Standard Deviation (Odds Ratio [OR] = 2.76, 95% Confidence intervals [CI]: 1.25-6.11, P = 0.012) and presence of renal dysfunction (OR=14.93, 95% CI: 2.55-87.32, P = 0.003) were associated with higher risk for AKI even after adjustment for age, gender, systolic blood presence and presence of diabetes. (Figure) In fact, baPWV was a stronger predictor of AKI than baseline creatinine (Area under the curve [AUC] 0.68, 95% CI 0.52-0.84, P=0.05 vs. AUC 0.61, 95% CI 0.46- 0.77, P = 0.21; P < 0.05). None of the patients was in renal replacement therapy before or after the surgery and this complication did not affect their discharge or survival.

Conclusion: baPWV could be considered as a useful predictive biomarker for AKI after SAVR, especially in patients with renal dysfunction prior to surgery.

ULTRASOUND AND FLUOROSCOPIC NAVIGATION ALGORITHM FOR APPLYING APICAL-MITRAL NEO CHORDS ON A BEATING HEART (AN ACUTE IN VIVO ANIMAL STUDY)

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Background: A new method of apical-mitral neo chords applying on a beating heart requires an ultrasound and fluoroscopic navigation algorithm.

Methods: 8 acute experiments were performed on mini-pigs and sheep. Special access port for multiple apical-mitral neo chord implantation was developed. Fluoroscopic and ultrasound navigation was used.

Results: The formation of apical-mitral neo chords on a beating heart is possible with the consistent use of fluoroscopic and ultrasound navigation. Ultrasound epicardial navigation involves choosing the puncture site of the left ventricular wall (linear sensor) to prevent papillary muscle damage. The choice of the instrument insertion direction and the required distances are determined using an epicardial ultrasound with a sector probe. J-conductor and a multi-channel introducer can be safely introduce in the left ventricle and left atrium using optimal C-arc positions: LAO 20-50° CAU 20-30°and RAO 20-30° CRA 10-20°.

The positioning of the delivery system and the choice of the leaflet puncture site are determined using a 2D and 3D transesophageal probe. The capture of a PTFE filament by a vascular loop with the creation of a u-shaped neo chord suture is carried out using LAO 20-50° CAU 20-30° fluoroscopy.

Conclusion: 1. Sequential X-ray and ultrasound navigation allows you to create apical-mitral neo chords with a u-shaped suture on the leaflet.

2. Fused simultaneous fluoroscopic and ultrasound navigation is necessary to facilitate the formation of apical-mitral neo chords.

REVERSE REMODELING OF THE LEFT VENTRICLE USING THE RADO II PROCEDURE IN END-STAGE ISCHEMIC DILATED CARDIOMYOPATHY: A 10-YEAR FOLLOW-UP STUDY

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Objective: Patients with end stage ischemic dilated cardiomyopathy (IsDCM) exhibit extensive remodeling of the left ventricle, and significant mitral and tricuspid regurgitation. We investigated if implantation of the artificial mitral valve with preservation of the native mitral valve could be used as a method combined with tricuspid annuloplasty and complete myocardial revascularization in end stage IsDCM (Reductive Annuloplasty of Double Orifice (RADO) II procedure).

Method: There were 42 patients (36 males, 6 females) with end stage IsDCM (NYHA III/IV). All patents had significant mitral and tricuspid regurgitation, mean ejection fraction below 30% (25.6±3.1%), and mean left ventricle end-diastolic internal diameter greater than 7.0 cm (7.3±0.3 cm) with coaptation depth of the mitral valve significantly greater than 1.1cm (STS "risk of mortality" score=22.04±1.5%; Euroscore II=7.04 ±1.02). In addition to complete myocardial revascularization biological or mechanical artificial valve was implanted in 38 and 4 patients respectively. Modified De Vega tricuspid annuloplasty was performed in all patients.

Results: One patient (2.38%) died during the 30-day postoperative period. Significant reverse remodeling of the heart was achieved measured by decrease of the endsystolic sphericity index (85.1% vs 66.2%) and improved ejection fraction (26.4% vs 34.6%). Clinical status of the patient was significantly improved immediately after procedure, and was stable 12 month after surgery. Long term results showed survival rate after 5 and 10 years of 83.33±6.1% and 54.45±6.3% respectively.

Conclusions: Reverse remodeling of the left ventricle by implantation of the artificial mitral valve, with preservation of the native mitral valve, annuloplasty of the tricuspid valve and complete myocardial revascularization (RADO II procedure) could be successfully applied in patients with end stage IsDCM. Our method should not be recognized as a valve repair, but ventricular repair. This method could be used as a bridge to heart transplantation or even destination therapy in selective patients.

COMPLEMENTARY INNOVATIVE CONCEPT FOR BETTER LONGEVITY OF THE 3D MITRAL RING ANNULOPLASTY, F.O TECHNIQUE

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Background: The use of the annulo-plastic ring is now a corner stone for any Mitral Valve repair (MVr) particularly the 3D saddle-shaped one that has been suggested for diminishing mitral annular strain, and improving leaflet coaptation geometry. However, diminishing Leaflet and chordal strain is also very important for the long term results of a successful repair as even minimal residual systolic prolapse of a segment of the anterior/posterior leaflet can exert stress on the respective chordae tendineae, potentially resulting in elongation over time and ultimately compromising the repair. In addressing this challenge, we hypothesized that the introduction of a 5/0 gore-tex bridge (F.O Bridge) between the Anterior and Posterior margins of the mitral valve annulus would mitigate leaflet prolapse, absorb stress during valve closure, and consequently alleviate strain on the cordae tendineae, thereby enhancing the long-term competence of the repaired mitral valve. We present our experience of using our newly innovated Bridge which had been progressed over the last five years to a unique technique named (F.O Tech.) aiming with collaboration with the 3D Ring to eliminate the Leaflet and Chordal strain and better long term results of the mitral valve repair whatever the technique used.

Patients and methods: From September 2018 to September 2023, we successfully treated Seventy patients with severe (4+/4+) mitral valve regurgitation due to different etiologies (Degenerative, Rheumatic or even Endocarditic) resulting in leaflet prolapse +/- chordal elongation or rupture using the appropriate technique with 3D Ring insertion in all cases as a routine. The 5/0 Gore-tex bridge (F.O Bridge) between the Anterior and Posterior margins of the mitral valve annulus was tailored after identifying the weak point suspected to suffer from leaflet prolapse or strain on the corresponding chordae tendineae.

Results: We included in our study only the patients successfully repaired. Two patients, who underwent valve replacement during the same operation due to mild to moderate mitral valve regurgitation were excluded. None of the patients had any residual mitral valve regurgitation at the end of the repair and on their discharge evaluated through transesophageal and transthoracic echocardiography respectively. There was no mortality at 30-days or on midterm follow-up. During the 3-6 month follow-up no regurgitation was noticed either. One Year follow up was 100% complete and highly satisfactory. No-Trivial Mitral regurge and Mean Pressure Gradient of (2.3+/-1.9 mmHg) which was comparable to the pre-discharge TTE.

Conclusions: Creating a bridge from the posterior mitral annulus to the anterior mitral annulus after mitral valve repair can reduce stress on the chordae tendineae by correcting any actual or expected residual leaflet prolapse, stabilizing the valve structure, improving valve function, and enhancing long-term durability of the repair. To our knowledge, This is the first series of the newly innovated concept and methodology of doing the this mitral ridge named F.O Bridge. The initial excellent immediate and long term results give us the enthusiasm to consider as essential step when indicated after implantation of the 3D Ring by the end of the MVr.

Keywords: Mitral valve repair, Mitral annuloplasty, 3D Ring, F.O Bridge.

THE IMPACT OF DIASTOLIC DYSFUNCTION OF A SINGLE VENTRICLE ON THE RESULTS OF THE FONTAN PROCEDURE.

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Impaired diastolic function of the single ventricle has an important role in the development of heart failure and serves as a trigger for the development of complications after Fontan surgery.

The aim - to study the influence of preoperative end-diastolic pressure (EDP) of a single ventricle on the results of the Fontan operation.

Materials and methods: From 1997 to 2024 in the department of CHD, 324 Fontan procedures in a modification of an extracardiac conduit were performed in patients with a functionally single ventricle. The retrospective study included 203 patients in whom EDP in a single ventricle was measured during cardiac catheterization before the Fontan procedure. All patients were divided into 2 groups: 1st- group - EDP <12 mmHg (n=190), 2nd - group - EDP >12 mmHg (n=13). Age of the patients was: in group 1st - Me=8 [6;14], in group 2nd - Me=9 years [6.75;12] (p=0.2), mean pulmonary artery pressure - Me=12 mmHg [10;14.5] and 13 mmHg [13;14] (p=0.32), SpO2 - 78% [75;84] and 79% [72;83] (p=0.29), Nakata index 270 mm/m^2 [210;345] and 270 mm/m^2 [210;345] (p=0.14), Severe AV valve insufficiency - 22 pts. and 3 pts. (p=0.002), Systemic RV - 66 pts. and 12 pts. (p=0.12), respectively.

Results: The follow-up duration after the Fontan procedure ranged from 1 to 21 years (6.2±4.3%). The incidence of mortality and complications was significantly higher in the group with EDP>12 mmHg (p=0.046 and p=0.034, respectively). Survival according to the Kaplan-Meier method in the group with EDP <12 mmHg was 89.5%, in the EDP >12 mmHg group - 61.5%. Freedom from the development of late complications in the long-term period in the group with EDP <12 mmHg - 16%, in the group with EDP>12 mmHg - 1% (p=0.056).

Conclusion: Increased EDP in patients with functionally single ventricle is risk factor for the development of complications after the Fontan operation. Impaired diastolic function of the functionally single ventricle might be an additional criteria in the selection of patients for the Fontan procedure.

A CASE OF FONTAN OPERATION FOR CORRECTED TRANSPOSITION OF GREAT ARTERIES WITH PULMONARY ATRESIA SEPTAL DEFECTS AND ABSENCE OF UPPER RIGHT PULMONARY ARTERY

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Background: The Fontan procedure is a palliative surgical intervention for patients with complex congenital heart defects such as those with single-ventricle physiology, tricuspid atresia or hypoplastic left heart syndrome. In this procedure systemic venous blood is redirecting to the pulmonary circulation, bypassing the heart and creating a total cavopulmonary connection.

Case Report: The clinical course of an 18-year-old female with complex congenital heart disease following Fontan surgery is described. The initial diagnosis revealed dextrocardia, situs inversus, corrected transposition of the great arteries, pulmonary atresia, and a large atrial and interventricular communication. At 17 days of age, she underwent a left modified Blalock-Taussig shunt. One year later, due to inadequate visualization of the right pulmonary artery, a new heart catheterization was performed, revealing the absence of the right upper pulmonary artery. This was followed by a right modified Blalock-Taussig shunt and enlargement of the right pulmonary artery with a PTFE patch. At 4.5 years of age, she underwent a cavopulmonary anastomosis (Glenn procedure), and one year later, a right pulmonary artery angioplasty was performed with placement of a Cook 535 8mm x 20mm stent, which was expanded to 12mm during the catheterization procedure. One month later, total surgical correction was achieved via the Fontan procedure. At 8 years of age, due to flow from the Fontan graft to the left atrium through a small communication (fenestration) of 5mm. A transvenous closure of the fenestration was performed using an Amplatzer Septal Occluder No. 4.. The contractility of the functionally single ventricle remains normal, with no stenosis or thrombus in the Fontan circuit, and satisfactory flow in the peripheral pulmonary arteries, which are of good size. A recent cardiac MRI revealed possible small aortopulmonary vessels arising from the descending thoracic aorta, as well as venovenous collateral vessels. The Qp/Qs ratio is 0.7, her clinical course is good, with an oxygen saturation (SatO2) of >98% and satisfactory exercise tolerance. For further investigation of her condition, she is scheduled for a new heart catheterization in the near future.

Conclusion: The staged Total Cavopulmonary Connection for a complex congenital heart disease is a good procedure in high-risk Fontan candidates with satisfactory results.

INCREASED LEFT VENTRICULAR OXYGEN DEMANDS IN INCREASED LV AFTERLOAD ASSOCIATED EARLY WITH VENTRICULAR ARRHYTHMIA OCCURRENCE

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Background: Difference for effective work in early stage of descending thoracic compares to ascending aortic stenosis and the relation to ventricular arrhythmia occurrence are inconclusive in LVH remodelling.

Objectives: relative difference of left ventricular pressure-volume area and stroke work in assessment of systolic left ventricular function in late and early LV afterload increase to be assessed in relation to ventricular arrhythmia occurrence.

Methods: Fourteen male domestic pigs underwent posterior-lateral thoracotomy for creating different peak in left ventricular afterload increase with banding the ascending supracoronary aorta (AB=8) for early LV afterload increase or descending thoracic aorta for chronic late LV afterload increase (DB=8). Left ventricular pressure-volume loops' were obtained during preload reduction in the 4^{th} and 8^{th} week of banding. Pressure-volume area and stroke work were assessed in linear and nonlinear (Burkhoff) regression of the end-systolic LV pressure-volume relationship fitted using special software. Repeated measures two-way ANOVA was used in statistical data analysis having means(SEM) or medians presented, for significant $p<0.05$.

Results: Left ventricular stroke work was increased, as the nonlinear PVA and O2 demand in the 8^{th} week, being greater in hypertrophic LV remodelling associated to LL compared to EL for the Burkhoff method of analysis (post hoc p=0.02).

In analysis for ventricular arrhythmia presence, nonlinear LV O2 demand was increased significantly in DB vs. AB (p=0.027), and when compared to normal rhythm (p=0.044). Indexed PVA was different between groups (p=0.008), in ventricular arrhythmia (p=0.012) and compares to normal rhythm (p=0.029), associating for difference in LV afterload between descending thoracic compares to ascending aortic stenosis (p=0.04). Difference in LV afterload associated for lLVO2 and effective LV work in LL vs. EL associated hypertrophic LV remodelling in presence of ventricular arrhythmia vs. normal rhythm (p=0.02).

Conclusions: LVO2 is affected earlier in hypertrophic remodelling in DB compared to AB being associated to ventricular arrhythmia occurrence in the porcine model of different peak of left ventricular afterload increase, and effective LV work in presence of higher SW. This indicates early increased LVO2 needs in LL.

APICAL LEFT VENTRICULAR HYPERTROPHY IN A TEENAGER WITH SURGICALLY CORRECTED SUBVALVULAR AORTIC STENOSIS AND NEGATIVE GENETIC TESTING FOR HCM

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Background: Apical Hypertrophic Cardiomyopathy (ApHCM), also known as Yamaguchi Syndrome, is a rare form of non-obstructive hypertrophic cardiomyopathy (HCM). The diagnostic imaging criteria for ApHCM include asymmetric hypertrophy primarily localized to the apex, with end-diastolic thickness exceeding 15 mm. Various genes have been implicated, and sporadic cases of the disease are often reported. The coexistence of ApHCM and subvalvular aortic membrane (Sub-AS) is a rare finding.

Case Report: A 16-year-old male adolescent was evaluated due to easy fatigue. The family history revealed a sudden maternal death at the age of 40. A systolic ejection murmur of 4/6 was detected. Laboratory tests and chest X-ray were normal. At rest, the electrocardiogram (ECG) showed sinus rhythm with left ventricular hypertrophy. Echocardiographic examination revealed significant left ventricular hypertrophy, particularly at the apex, a dysplastic tricuspid aortic valve, and a subaortic membrane with a fixed obstruction of the left ventricular outflow tract (LVOT) causing significant stenosis (maximum velocity: 4.4 m/s, mean pressure gradient: 45 mmHg) without dynamic obstruction. Surgical resection of the subaortic membrane (Sub-AS) and aortic valve cusp repair were performed. Six months post-surgery, no residual pressure gradient in the LVOT was detected. However, significant apical left ventricular hypertrophy persisted (17 mm), with increased trabeculation at the apex. The ejection fraction remained 53% (Simpson's method), despite the removal of the LVOT obstruction. These findings, combined with the family history of sudden death, raised suspicion of a hereditary cardiomyopathy, with ApHCM and non-compacted myocardium being the leading possibilities. Ambulatory ECG remained normal. Genetic testing for cardiomyopathies was negative. The patient is under ongoing follow-up.

Conclusion: The coexistence of Sub-AS and ApHCM is extremely rare and mimics the classic form of hypertrophic cardiomyopathy. However, cases of ApHCM with concurrent Sub-AS have not been reported in the literature. Whether this coexistence represents a random finding or is related to an underlying genetic predisposition remains to be studied.

METASTATIC MALIGNANT MELANOMA OF THE RIGHT ATRIUM

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Background: A ntemortem diagnoses of intracardiac metastases are uncommon. Metastatic melanoma shows a propensity for cardiac

involvement, but cardiac involvement by melanoma is rarely identified clinically due to a paucity of cardiac symptoms. Usually the diagnosis is established in postmortem. In this case, we report a surgery of melanoma of the right atrium (RA).At our knowledge, no similar case was reported in the literature.

Case report: We report a case of a female patient 54-year-old with a metastatic melanoma on the right atrium (RA). The patient had also hepatic secondary localization of a melanoma, for which she had immunotherapy. She following treatment, an immuno-induced myositis and myocarditis without left ventricular dysfunction, she had corticosteroid therapy with a good evolution.4 years later, She had a TEP TDM as part of the follow-up that showed Areas of hypermetabolism in projection of right atrium. The echocardiography showed a well-defined mass with a diameter of 36 mm, heterogeneous, developed in the RA, no significant valvulopathies, and good biventricular function.The cardiac MRI showed a heterogeneous tissue mass measuring 45 mm in its largest diameter, located in the posterior wall of the RA, suggesting a secondary lesion with possibly an associated thrombotic component, the tumor was with extensive vascularization on cardiac CT scan

The patient underwent cardiac surgery with CBP with a beating heart and no aortic clampage. A surgical removal of the mtumor from the RA with reconstruction using a pericardial patch by sternotomy has been performed. Postoperative course was uneventful. The anatomopatholgy confirm the diagnosis of melanoma .The postoperative imaging one year after showed no recurrence of the RA tumor.

In conclusion, the cardiac metastasis from melanoma remains a rare but clinically significant occurrence. Early detection and a multidisciplinary approach are essential for improving patient outcomes.

Keywords: Cardiac tumor, melanoma on the right atrium, Cardiopulmonary bypass

Friday May 16,2025
Conference Room 2
17.30 - 18.40

IPSILATERAL PARADOXICAL THROMBOEMBOLIC EVENT LEADING TO ACUTE LIMB ISCHEMIA

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Ipsilateral Paradoxical Thromboembolic Event Leading to Acute Limb Ischemia

Background:A patent foramen ovale (PFO) is a congenital cardiac anomaly persisting in approximately 25% of the general population. It serves as a potential conduit for paradoxical embolism, a condition in which embolic material bypasses the pulmonary circulation and enters the arterial system, leading to ischemic events. While paradoxical embolism is commonly associated with cryptogenic strokes, its presentation as an ipsilateral arterial embolism remains exceedingly rare.

Case Presentation: We report a unique case of a 41-year-old female who presented with a four-week history of progressive right lower limb pain exacerbated by physical activity. Initial misdiagnosis as an orthopedic condition delayed appropriate vascular assessment. The patient had a history of Crohn's disease, type II diabetes mellitus, hypertension, and hypercholesterolemia, and had been on long-term oral contraceptives.

Clinical examination revealed an absence of distal pulses in the right lower limb with prolonged capillary refill time and mild sensory-motor impairment. MR angiography demonstrated a thrombotic occlusion of the distal superficial femoral artery, popliteal artery, and tibiofibular trunk. A transesophageal echocardiography (TEE) confirmed the presence of a small PFO, while venous duplex ultrasonography detected a two-level deep vein thrombosis (DVT) involving the right popliteal and tibial veins.
Given the failure of thrombolysis due to an old, organized thrombus, a femoropopliteal bypass using a reversed great saphenous vein was performed. Postoperatively, the patient was placed on long-term anticoagulation therapy with Apixaban, and discontinuation of oral contraceptives was advised to mitigate thrombotic risk. The cardiology team opted for a conservative approach regarding PFO closure.

Discussion: Ipsilateral paradoxical embolism is an extremely rare entity, with most paradoxical embolic events occurring contralaterally due to systemic arterial flow dynamics. This case highlights the importance of a high index of suspicion for paradoxical embolism in patients presenting with acute limb ischemia, particularly when associated with venous thromboembolism and PFO. The Valsalva maneuver during jogging may have precipitated a transient right-to-left shunting event, leading to embolization.

A structured multidisciplinary approach, involving vascular surgery, cardiology, and hematology, is critical for diagnosing and managing such cases. While PFO closure remains a

debated therapeutic option, long-term anticoagulation and risk factor modification remain essential to prevent recurrent embolic events.

Conclusion: This case underscores the diagnostic and therapeutic complexities associated with paradoxical embolism in the lower limb and emphasizes the importance of early recognition and intervention. A tailored interdisciplinary approach is paramount to optimizing patient outcomes.

DEVELOPING A PORCINE ARTERIAL MODEL TO STUDY CELLULAR SENESCENCE

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Introduction: Swine are increasingly used as models in cardiovascular research due to their physiological and anatomical similarities to humans. To date, no animal models have been developed for studying cellular senescence. In this study, we aimed to investigate the potential of a porcine model for studying cellular senescence particularly in the context of novel drug combinations containing senolytics.

Methods: This study was conducted as part of the DECODE European Project (Marie-Curie) We used a porcine animal model where we placed overlapping stents into the porcine superficial femoral arteries to cause vascular damage and mimic the formation of atherosclerotic lesions as well as intimal hyperplasia. After one month, angioplasty with drug-coated balloons was performed. The animals were then euthanised, naïve and stented artery segments were removed, preserved in resin, and subjected to histological examination. To evaluate the reaction of vascular tissue, GLF16 was used as a biomarker for cellular senescence.

Results: Our results demonstrated that stented arteries showed early senescent activity, especially in fibroblasts centred around the stent site, but naïve arteries showed no evidence of senescence. These findings imply that mechanical and pharmacological stress brought on by stents may be a factor in the early senescence of vascular cells.

Conclusions: Stented porcine arteries offer a suitable platform for assessing the efficacy of senolytic treatments when combined with already available medications for usage in drug-coated balloons and stents. We may lessen systemic toxicity while improving treatment results by using lower doses of each drug to target various pathways implicated in plaque or intimal hyperplasia formation. Preclinical testing of such combination techniques, which may enhance long-term vascular healing and decrease restenosis, could be made possible by the porcine model.

DECOMPRESSION OF POPLITEAL ARTERY ENTRAPMENT SYNDROME COMBINED WITH SIMULTANEOUS ANGIOPLASTY

Odysseas Lomvardeas, Afroditi-Maria Mitka, Thomas Kalogirou, Nikolaos Asaloumidis, Ioakeim Giagtzidis, Marwan Elmoghrabi, Antonios Oikonomou[1], Christos Karkos[1], Konstantinos Papazoglou

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Background: Popliteal Artery Entrapment Syndrome (PAES) is a rare type of vascular occlusion (incidence: 0.6-3.5%), which occurs usually in well-trained people, as a result of popliteal artery compression by ectopic myotendinous structures. PAES usually manifests as post-exercise claudication or pain in feet and calves. CT- or MRI- Angiography are considered as gold standard imaging. Management depends on the presence of symptoms and open surgical correction is indicated in symptomatic patients. We present a patient with PAES who underwent decompression combined with ballon angioplasty of the popliteal artery.

Case: A 56-year-old trainer presented to the Emergency Department with acute limb ischemia and underwent a successful thrombectomy. A complete cardiac examination did not point out any cardiac disease and he was put in anticoagulant therapy. Two months later, the patient reported symptoms suggesting PAES. He underwent a CT-Angiography and based, on its result, a DSA, which confirmed PAES.

The patient underwent an open procedure, under general anesthesia. Initially, he was placed in a prone position. Popliteal artery was carefully exposed, all the myotendinous structures were recognized and the muscular structure responsible was divided. At the end of the procedure, the patient manifested acute limb ischemia. He was turned in supine position and a DSA was conducted, which revealed a short occlusion of the popliteal artery due to an atherosclerotic flap. Angioplasty was performed and blood flow was restored. Post-operatively, he had an uneventful outcome. During the last follow-up the patient was symptom-free with palpable pulses and normal U/S findings. In conclusion, decompression of PAES combined with simultaneous angioplasty when needed is a valid and effective treatment option.

USE OF BIODEGRADABLE PERIPHERAL STENTS IN THE TREATMENT OF ARTERIAL OCCLUSIVE DISEASES: LATE RESULTS

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Forty-four patients were treated with Remedy biodegradable peripheral stents (Kyoto Medical Planning Co., Ltd., Japan). The patients were aged between 53 and 82 years (mean age 67 years). Nine of the patients were female and 35 were male. Arterial stenosis or occlusion was present in 75 segments, including the common iliac arteries in 11 of 44 patients (bilateral in 5 patients), the superficial femoral arteries in 35 patients (bilateral in 14 patients), and the popliteal arteries in 7 patients (bilateral in 3 patients). Fourteen of the patients were receiving treatment for insulin-dependent diabetes mellitus. Fontaine grade III symptoms were present in 9 patients, and grade IIb symptoms were present in the other patients. CT angiography was performed on all patients before the procedure. The patients were followed up at 1, 3, 6, 12, and 18 months. Full patency was achieved in all patients after the procedure. During the follow-up period, stent occlusion was detected in 4 patients (one patient at the 11th month, 3 patients after the 12th month). Biodegradable stents may be an advantageous choice because the reactions seen in metal stents are not observed.

INCREASED PERIAORTIC FAT VOLUME AND CHARACTERISTICS OF FAT DEPOTS IN PERIPHERAL ARTERIAL DISEASE

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Background: Epicardial fat and periaortic fat are specific fat depots in the vicinity of the heart and the great vessels, that have normally brown fat characteristics and a significant role in cardiovascular pathogenesis. The role of those fat depots in patients with peripheral arterial disease (PAD) is under investigation.

Methods and Results: This is a prospective study that aimed to investigate possible differences in epicardial and periaortic fat volumes and their associations with metabolic parameters, cardiac structure and function in 57 patients with PAD and 23 controls. Quantification of epicardial fat and periaortic fat volume was performed using computed tomography, Fig 1A, which also gives data on the Coronary Artery Calcium (CAC) Score. Data of echocardiographic, clinical and laboratory parameters are presented in Table1. While the 2 groups did not differ in lipid levels, inflammatory markers and CAC score, periaortic fat was significantly larger in the PAD group compared with controls (p=0.01), Fig 1B. No difference existed in epicardial fat volume between groups. Interleukin-6, a strong inflammatory marker, was associated with periaortic fat in all study participants , Fig 1C. The receiver operating characteristic (ROC) curve showed that periaortic fat volume of 11,9 cm^3 had strongest diagnostic value for detecting PAD, with a sensitivity of 83% and a specificity of 81%, (AUC 0.71), Fig 1 D**.**

Conclusion: Periaortic fat but not epicardial fat volume is significantly greater in patients with PAD and may serve as an index of peripheral arterial disease. This implicates that local fat depots may have a role in the occurrence and progression of atherosclerosis of the aorta and the peripheral vasculature.

OPEN SURGICAL REPAIR OF A TRUE RIGHT AXILLARY ARTERY ANEURYSM WITH INTERPOSITION REVERSED CEPHALIC VEIN BYPASS - A CASE REPORT

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Background: Axillary artery aneurysms are rare, constituting <1% of all peripheral arterial aneurysms. They pose significant risks, including thromboembolic events, distal ischemia, rupture, and brachial plexus compression. Etiologies include trauma, iatrogenic injury, thoracic outlet syndrome, collagen diseases, and chronic degenerative changes, with atherosclerosis being a rare cause.

Case report: A 66-year-old male with a history of smoking, COPD, hypertension, myocardial infarction, and prior branched- EVAR for a type IV thoracoabdominal aneurysm was evaluated for a right axillary artery aneurysm which was incidentally discovered during preoperative workup with a CTA for the thoracoabdominal aneurysm. Physical examination revealed a palpable, non-tender, pulsatile mass in the right axillary fossa, with intact distal pulses and no ischemia signs. The patient had noticed numbness in the right ring and little fingers. CTA showed a right mid-to-distal third axillary artery aneurysm (3 cm x 2.75 cm) with mural thrombus. Given the patient's neurologic symptoms, thromboembolic risk and aneurysm size, we decided to perform an open repair. Under general anesthesia, the right arm was placed at 90° abduction. An axillary incision was made lateral to the pectoralis major muscle towards the axillary fossa and the anatomic position of the axillary artery on the upper arm. The aneurysmal sac was opened, and thrombus was evacuated. Subsequently, the right cephalic vein was harvested and utilized in a reversed fashion for interposition bypass with end-to-end anastomoses. Postoperatively, the patient had palpable brachial, radial and ulnar pulses with improvement of the neurologic symptoms. He was discharged on aspirin, clopidogrel, and statin, with patent bypass during follow-up. This case underscores the importance of symptomatology and the detailed physical examination in patients with aneurysmal disease. In this challenging case, vein bypass serves as a more durable option in upper limb aneurysm repair compared to endovascular options given the mobility of the shoulder.

PERIPHERAL ARTERIAL DISEASE AT A TERTIARY REFERRAL CENTER IN SAUDI ARABIA: COMPLEXITY AND DEMOGRAPHICS

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Purpose: Current endovascular interventions and devices are based on studies from the non-Arab World. Our aim is to assess the disease complexity among our subset of patients, and establish a femoropopliteal arterial diameter reference to better understand and serve our population.

Materials and methods: A retrospective, consecutive review was performed from 2017 till 2022 after IRB approval. Selection included symptomatic Saudi PAD patients who underwent CTA runoff and endovascular intervention at our institution. Patients with aortoiliac disease were excluded. Demographics, comorbidities, number of lesions, complexity, and femoropopliteal arterial diameter were recorded. Associations were determined using ANOVA, Student's t-tests and non-parametric equivalent tests and using Chi-Square and Fisher's exact tests according to distribution of the data.

Results: 180/638 patients met the criteria: 127 (70.6%) males, 64.7±12 years, 162 (90%) diabetics, 144 (80%) with hypertension, 80 (44.4%) with chronic renal failure, and 66 (36.7%) on dialysis. 55 (30.5%) are in wheelchairs/bedbound. Advanced disease was noted (TASC C&D) above the knee (88 (54.3%)) and below the knee (94 (60.6%)). There were no significant associations between comorbidities and TASC. Female gender was significantly associated with number of lesions (2-10 lesions), (Chi-sq=4.1, df=1, p=0.0430). The median diameters of the CFA, proximal SFA, distal SFA and popliteal arteries were 7.8, 6, 5.7, and 5 mm, respectively in males; and 7, 6, 5.6, and 5 mm, respectively in females.

Conclusion: Our PAD patients present late, with advanced disease and more than one arterial lesion. Diabetes is highly prevalent, with many renal failure patients on dialysis compared to the literature.

Friday May 16,2025
Conference Room 2
18.40 - 20.00

USE OF COOK ZENITH ILIAC BRANCH DEVICE FOR INTERNAL ILIAC ARTERY FLOW PRESERVATION DURING EVAR. EXPERIENCE OF A TERTIARY CENTER

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Introduction: The preservation of blood flow in the internal iliac arteries (IIAs) and their branches using Iliac Branch Devices (IBD) during aorto-iliac and iliac aneurysms has proven to be an effective technique, aiming to avoid complications associated with occlusion of the IIAs. The aim of this study is to endovascular repair for aortoiliac and iliac aneurysms using an IBD in early and mid-term period.

Methods: A single-center, retrospective study of prospectively collected data was conducted. All consecutive patients who underwent implantation of the ZBIS device (COOK GROUP, Bloomington, Indiana, US) between May 2017 and September 2024 were included. Baseline characteristics, intraoperative, and perioperative data were collected. The main outcomes of the study included technical success rate, 30-day primary patency and mortality rates, as well as primary patency, reintervention, morbidity and mortality rates during the mid-term follow up period.

Results: Thirty-four patients (33 males; mean age 70.2 ± 6.7 years) were included, with a total of 39 IBDs implanted during the study period; five patients received bilateral IBDs. Twenty-eight patients (82%) underwent simultaneous EVAR for infrarenal abdominal aortic aneurysm while six patients (18%) had complex aneurysms: two FEVARs, three BEVARs, and one combined BEVAR with TEVAR, along with simultaneous carotid-subclavian bypass for thoracoabdominal aneurysm. Axillary artery access was utilized in two IBD cases (5%). Technical success was achieved in 38/39 IBDs (97.5%). In terms of early outcomes, 30-day primary patency rate was 94% (36/39 IBDs). The mean follow up was 30.5±17.6 The primary patency rate at first, sixth and twelve months rate was 94%, 86% and 78% retrospectively, while one patient needed reintervention during the follow-up period. One patient died the thirtieth postoperative day in the intensive care unit (ICU), while one additional patient died the first month due to acute myocardial infarction. One patient required common femoral artery endarterectomy for acute limb ischemia, and another patient underwent percutaneous angioplasty for restenosis of the right limb.

Conclusions: Endovascular aneurysm repair with the ZBIS (COOK GROUP, Bloomington, Indiana, US) device proves to be an effective and safe technique, with low reintervention rate. Regarding patency rate still remains an issue during follow up, however it proves to be a favorable choice for preserving blood flow in the internal iliac arteries.

ROTATIONAL MECHANICAL THROMBECTOMY FOR TREATING ILIAC LIMB THROMBOSIS AFTER EVAR

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Aim: Iliac limb thrombosis after endovascular aneurysm repair (EVAR) is one of the possible complications that may affect long-term outcomes. We report outcomes from two vascular centers of patients with iliac limb occlusion treated with rotational mechanical thrombectomy.

Methods: A two-center retrospective analysis of consecutive EVAR patients presenting with iliac limb thrombosis that underwent rotational mechanical thrombectomy using the Rotarex S device (BD, NJ, USA), from 2021 to 2024 was undertaken. Early outcomes included technical success, perioperative complications, morbidity and mortality. Follow-up outcomes included primary patency, freedom from reinterventions or any other complication.

Results: The study included 16 male patients. All patients were symptomatic. Technical success was achieved in 15 cases (93.8%). Primary relining with stent-grafts or balloon expandable covered stents (BxCS) was performed in all patients, while stenting of the outflow vessel was needed in 10 patients (62.5%). During a median follow-up period of 21 months none of the patients experienced any thrombotic event. No reinterventions were needed.

Conclusion: Debulking with the Rotarex rotational atherectomy device combined with stent-graft relining may produce satisfactory mid-term outcomes in patients with stent-graft thrombosis after EVAR. This approach seems safe and effective and could be considered the first line a useful strategy in patients with limb thrombosis after EVAR.

USE OF FENESTRATED/BRANCHED ENDOVASCULAR DEVICES FOR RESCUE OF PROXIMAL ENDOGRAFT FAILURE AFTER INFRARENAL ENDOVASCULAR ANEURYSM REPAIR - A SYSTEMATIC REVIEW AND AN UPDATED META-ANALYSIS

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Background-Aim: To present the current outcomes of F/BEVAR for rescue of proximal endograft failure after EVAR. A systematic review of the currently published literature on F/BEVAR for failed EVAR is undertaken and the eligible studies are combined into a meta-analysis with the intention of evaluating the safety, efficacy and the durability of this treatment option.

Methods: A systematic review of the literature up to September 2024 was performed according to PRISMA guidelines (CRD42024590847). Studies were included in the meta-analysis if they reported ³10 patients and at least one of the major outcomes was stated. Primary endpoint was technical success (efficacy). Secondary endpoints included 30-day/in-hospital mortality and morbidity (safety) and survival and reinterventions rate (durability). Methodological quality and robustness of the results of the eligible articles were assessed according to JBI's critical appraisal tool.

Results: A total of 16 studies with overall 1079 patients were included. The pooled estimate for technical success was 94.4% (95% CI 92.5% to 95.8%), whereas for the 30-day/in-hospital mortality 3.9% (95% CI 2.9% to 5.4%). Permanent paraplegia was developed in a pooled rate of 1.6% (95% CI 0.8% to 3.0%), whereas a cerebrovascular event in a pooled rate of 1.5% (95% CI 0.9% to 2.8%). An acute renal function impairment requiring new onset dialysis occurred with a pooled rate of 4.4% (95% CI 3.2% to 6.1%). Postoperative respiratory failure was observed with a pooled estimate of 7.2% (95% CI 5.5% to 9.4%). The pooled estimate for 12-month overall survival was 88% (95% CI 83.4% to 91.4%) and the pooled estimate for 24-month and 36-month survival were 79.8% (95% CI 75.6% to 83.4%) and 72.2% (95% CI 66.7% to 77.2%), respectively. Freedom from reintervention was estimated at 83.7% (95% CI 79.9% to 86.9%) for 12 months, 75.8% (95% CI 61.0% to 86.2%) for 24 months and 59.3% (95% CI 36.5% to 78.7%) for 36 months.

Conclusion: This study showed that F/BEVAR is a feasible, safe and reliable strategy for achieving proper proximal endograft sealing when previous EVAR has failed. The mid-term survival of these patients is acceptable, whereas reinterventions are not negligible.

COMPARISON OF MANUAL VERSUS FULLY AUTOMATIC DETECTION OF SMALL CHANGES IN ABDOMINAL AORTIC ANEURYSM DIAMETER

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Background-Aim. To this day, aortic diameter remains the main parameter used for diagnosis, clinical decision making, and surveillance of abdominal aortic aneurysms (AAA). However, diameter measurement has some limitations, such as high inter- and intra-observer variability and poor ability to detect small changes. This study aimed to evaluate the ability to manually detect AAA maximum diameter (Dmax) enlargement and compare it with a fully automatic method.

Methods. Ten sets of initial and follow-up abdominal and pelvic CTA scans from 10 patients with AAAs (totaling 20 CTA image series) were used. An expert examiner performed diameter measurements in all scans using 3D reconstruction, and these measurements were further used as the ground truth. 14 specialists (10 vascular surgeons, 2 vascular surgery residents and 2 interventional radiologists) measured maximum diameter (mm) of the abdominal aorta based upon their standard practice. Cases for measurement were presented in a random order. Time consumption (s) for each measurement was recorded as well. Aortic diameters in all cases were also calculated automatically using theEndoArt artificial intelligence (AI) algorithm. The ability to detect diameter enlargement in follow-up images was compared between specialists (manual measurements) and the AI algorithm.

Results. In total, 280 manual measurements were made. Time consumption for manual diameter measurement ranged from 12 to 172 seconds per case, with an average of 48 seconds. A good agreement among observers was found (intraclass correlation = 0.878). However, in 47 out of 280 measurements (16,8%), specialists failed to detect a diameter increase or even measured smaller maximum diameter in follow-up images. Despite individual errors in detecting size changes in certain cases, a mutual trend of measuring a smaller Dmax in follow-up images was observed in 2 out of 10 cases. Meanwhile, the AI algorithm accurately detected diameter enlargement in all cases.

Conclusions. Manual maximum diameter measurement is not completely accurate in detecting small aneurysm size changes. Whereas in this study, the AI algorithm demonstrated superior performance, correctly identifying size changes in 100% of cases. These findings highlight the importance of implementing automatic aortic segmentation tools into clinical practice to enhance measurement accuracy, reduce human error, and optimize surveilance strategies for aneurysm progression.

EVALUATION OF THE NOVEL ENDOVASTEC ALTURA AND MINOS AORTIC ENDOGRAFT PLATFORMS: A SINGLE CENTER REVIEW OF 20 CASES

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Background/Aims: This study reports outcomes of two novel low-profile (14Fr) endografts (Altura & Minos) from the same manufacturer (Endovastec) in patients treated by endovascular aneurysm repair (EVAR) for abdominal aortic aneurysms (AAA). Altura is a braided-stent endoskeleton comprised of two independent "D" shaped actively fixated and repositionable components introduced by each iliac to make the aortic tube. Minos is a very low proflle modular exoskeleton device made up of an active fixation bifurcated body and two limbs. The goal is to assess and compare safety, technical success, and short-term efficacy while demonstrating unique endograft characteristics in different AAA anatomies.

Methods: All patients treated with Minos & Altura for infrarenal & pararenal AAA between September 2023 and March 2025 were included in the study. They all underwent percutaneous EVAR in a hybrid operating theater by the same team of vascular surgeons. Primary endpoints were technical success and 30-day morbidity & mortality. Secondary endpoints included aneurysm related mortality, aneurysm sac reduction and the incidence of endoleaks.

Results: Twenty patients (5 females; mean age 76.25 years) were treated with 10 Minos & 9 Altura endografts for infrarenal AAA while 1 case underwent a fenestrated Altura repair for a pararenal AAA. Technical success was 100%. Thirty day morbidity was 5% (1 femoral cutdown due to limb ischemia) and mortality was 5% (1 death due to post-op myocardial infarction). Neck length was 20.1mm for Altura & 18.55mm for Minos (p=0.5). Average hospital stay was 2.75 days. Mean follow-up was 8 months. Ten patients (50%) demonstrated sac shrinkage, 8 (40%) showing sac size steadiness and two (10%) millimetric sac growth. Two patients (10%) had type 2 endoleaks while no aneurysm related mortality took place during follow-up.

Conclusion: Both endografts demonstrated high implantation technical success and zero 30-day and short-term aneurysm related mortality. Both devices achieved short-term favorable sac size reduction. Further studies are needed for long-term assessment but the results suggest both endografts are effective and safe as a low-profile EVAR platform.

THE WORLD-FIRST NELLIX ENDOVASCULAR SALVAGE USING THE ENDOVASTEC MERIDIAN ENDOGRAFT - A LOW-PROFILE CUSTOM FENESTRATED SOLUTION BASED ON THE ALTURA PLATFORM

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Background: Failing of the Nellix endograft has been posing serious problems when patients are not good open surgery candidates. Current custom solutions require large profile delivery systems and need to cover significant proximal aortic length to accommodate branches and short bifurcations. The Meridian custom fenestrated device is based on the Altura platform and can provide a low profile solution without the need of a long proximal aortic seal thus sparing lumbar and intercostal arteries. We present the first-in-world Meridian used to salvage a failing Nellix device.

Case Report:A male patient was treated with Nellix in 2017 and recent follow up showed distal migration and an anterior type 1A endoleak reperfusing the sac without enough distance between the Nellix and the renal arteries to properly deploy any device. A custom built Meridian endograft with two fenestrations for the renal arteries was designed as an endovascular solution for this 85-year-old CAD patient. Implantation was succesful and will be presented as an edited live case video. Final angiogram demonstrated an excellent result with exclusion of the endoleak and patency of the renal arteries. Six month follow-up computed tomography angiography showed a type 2 endoleak without sac growth.

CAN YOU FIX MY ANEURYSM? 3D PRINTED MODELS AS A TOOL FOR EFFECTIVE COMMUNICATION WITH THE SURGICAL PATIENT.

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Background: Three-dimensional (3D) printing has emerged as a valuable tool in medicine, enabling the creation of models that can be examined from multiple perspectives and effectively employed in patient education. This study aimed to determine whether educating patients about aortic aneurysms and their planned surgery using 3D models is more effective than traditional explanations and whether it helps reduce preoperative anxiety.

Methods: Three physiologically sized aneurysm models were prepared: a classic abdominal aortic aneurysm, a type IV thoracoabdominal aortic aneurysm, and an aortoiliac aneurysm. Patients undergoing open aortic repair (OAR) or endovascular aneurysm repair (EVAR) at the Vascular Surgery Department of the University Clinical Center (UCK) in Gdansk between August 2024 and January 2025 were randomized into two groups using the Random application: Group A (education with a 3D model) and Group B (education without a 3D model).

A structured questionnaire was developed to evaluate the education process comprehensively. Before the educational session, the questionnaire assessed: exclusion criteria (diagnosis of Alzheimer's disease, depression, or anxiety disorders), generalized anxiety levels using the Generalized Anxiety Disorder Questionnaire (GAD-7), baseline understanding of the procedure the patient was scheduled to undergo, and the current level of anxiety regarding the procedure.

After the educational intervention, the following were re-assessed: understanding of the procedure and current level of anxiety regarding the procedure. Additionally, Group A patients were asked to evaluate the 3D aneurysm model.

Results: Preliminary results from 42 participants (21 in Group A) revealed that patients educated with 3D models more frequently reported an improved understanding of the procedure compared to those in Group B. The difference between baseline and post-education comprehension was also higher in Group A. However, the decrease in anxiety after education does not differ significantly between groups.

Conclusions: Education using 3D models appears to be a more effective communication tool than traditional discussions about aortic aneurysms and their treatment. Continued recruitment, aiming for a total of 60 participants, is expected to provide more robust data and deeper insights into the benefits of this approach.

ENCHANT STUDY, EXPERIENCE OF A SINGLE PARTICIPATING CENTER

Odysseas Lomvardeas, Ioakeim Giagtzidis, Afroditi-Maria Mitka, Nikolaos Asaloumidis, Marwan Elmoghrabi, Antonios Oikonomou, Christos Karkos, Konstantinos Papazoglou
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Background -Aim: Chimney graft Endovascular Aneurysm Repair (ChEVAR) is one of the two most commonly endovascular used techniques for treatment of juxta-renal abdominal aortic aneurysms (AAA) which represent approximately 15% of AAAs, worldwide. ChEVAR aims to extend the graft's proximal sealing zone maintaining perfusion of renal arteries. Medtronic has launched Endurant™ II/IIs system combined with Radiant™ balloon-expandable covered stent, as treatment of Juxtarenal AAAs. ENCHANT is an ongoing multicenter, prospective, single-arm, post-market study to assess the clinical outcomes, safety, and performance of this technique. This study presents the experience of a single participating center.

Methods: Between 2018 and 2025, 9 male patients have been enrolled in ENCHANT, with a mean age of 79 years. All patients were operated under local anesthesia with bilateral common femoral and left axillary access. 5 patients were treated with single chimney technique while 4 of them underwent bilateral renal stent grafting.

Results: Technical success was 100%. No major complications were reported post-operatively and average length of stay was 3 days. 30-day mortality was 11.1% (n=1). Overall mortality is 22.2% (n=2) not aneurysm related. During an average 27 months follow up period 1 patient (11.1%) presented type Ia endoleak.

Conclusions: ENCHANT study is ending the enrollment of new patients, since it reached its target to enroll 150 patients with a follow up period of 5 years. No overall data is available yet. This study along with current literature, suggest that ChEVAR is safe with good early and midterm results and steep learning curve to treat complex aortic anatomies with off the shelf-devices. As in any surgical technique, clear indications and patient selection is mandatory for best results.

URINE BIOMARKERS FOR AAA RUPTURE- IS IT WORTH INVESTIGATING? THE PILOT STUDY

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Ruptured abdominal aortic aneurysm (RAAA) is the leading cause of vascular-related deaths and overall mortality rate is still high. However, biomarkers capable of identifying the most at-risk population and detecting abdominal aneurysms (AAA) before it becomes clinically apparent are urgently needed in the clinic.

Materials and Methods: In this study, we applied a methodology using multiplexed kinase inhibitor-conjugated beads (MIBs) to examine kinases as potential biomarkers in the urine samples. The microarray study used urine samples of 5 patients with AAA operated electively and 5 patients operated due to AAA rupture urgently. Quantitative proteomic profiling by iTRAQ and LC TEMPO MALDI-TOF/TOF identified multiple kinome differences in the RAA patients and elective AAA patient's controls.

MS Analysis: MS and MS/MS data were acquired on a MALDI TOF/TOF 5800 or 4800 (AB SCIEX). MS/MS spectra were searched against the Uniprot/Swiss-Prot database with Protein Pilot™ software version 3.0 (AB SCIEX) (Paragon algorithm 3.0.0.0, 113442) for peptide and protein identifications. Protein identifications were accepted with an Unused ProtScore .1.3 (corresponding to .95% confidence).

Statistical and bioinformatics methods: All tests were performed using R/Bioconductor statistical software. Bioinformatics analysis was performed using some open source software. Bioconductor and Cytoscape software were used as additional tools for the data visualization.

Results: We identified alterations in the urine proteome in acute operated RAAA patients compared with electively AAA controls. Importantly, we identified 7 proteins commonly found to be significantly down-regulated in RAAA patients - all of them are tyrosine kinases and include 4 Ephrin type receptors. The are known to be involved in biological processes such as signal transduction, cell motility and migration, cell adhesion, cell projection organization and substrate adhesion-dependent cell spreading. The kinetics of these proteins correlated with the disease state.

Conclusions: These urine biomarkers could potentially aid in the early detection of AAA rupture. In addition, this method allows the use of alternative sample sources namely urine, proposing a safe, noninvasive collection of specimens.

Saturday May 17,2025
Conference Room 1
15.00 - 17.30

ID:21703 | IS THERE ANY OTHER SURGICAL OPTION TO DO IN FRONT OF EXTENSIVE CALCIFICATION OF MITRAL ANNULUS EXCEPT THE GOLD STANDARD?

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Backround: The surgery managment of the mitral valve in the context of Mitral annular calcification has been the cardiac surgeon's nightmare and challenge for a long time. The most frequent surgical technique described in the literature consist on the annular decalcification which requires reconstruction of the atrioventricular junction followed by mitral valve replacement, This- despite being the ideal solution however requires surgical expertise, time and may not be a safe option in some patients with the risk of atrioventricular dissociation, periprosthetic leakage, valve dehiscence and circumflex coronary artery injury.

Case report: We report the case of a 63 years old female patient with severe symptomatic mitral stenosis: NYHA class III dyspnea, and a history of three episodes of cardiac decompensation referred to our department for cardiac surgery. The preoperative cardiac CT scan showed very severe mitral annular calcification, which made performing a conventional mitral valve replacement significantly increase the operative risk. In front of this situation we decide to realize a **Transcatheter mitral valve replacement (TMVR) by hybrid procedure using** mitral Prosthesis *N°=29* **with myomectomy of interventricular septum.** The post-operative course was uneventful.

In some situations when the gold standard technique can't be feasible, we recommend this surgical option to manage mitral valve calcification and save the patient by by using the hybrid procedure TMVI.

Key-words:_Mitral annulus calcification, , Transcatheter mitral valve replacement ,hybrid procedure.

MODIFIED PERCEVAL SUTURELESS BIOPROSTHETIC AORTIC VALVE IMPLANTATION FOLLOWING FAILED TRANSCATHETER AORTIC VALVE REPLACEMENT: A CASE SERIES

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Objectives-Aim: Transcatheter aortic valve replacement (TAVR) has been routinely adopted for high, intermediate and low-risk patients, particularly in the elderly population. Over the past decade, complications during TAVR procedures have become increasingly rare, especially in high-volume centers. However, a subset of patients may still experience immediate or delayed complications that necessitate surgical aortic valve replacement (SAVR). Currently, the optimal surgical approach for these patients remains uncertain. Therefore, we present a unique case series of three patients who underwent SAVR after failed TAVR.

Methods: Two patients required salvage SAVR due to TAVR prothesis dislocation and aortic annulus rupture immediately during the TAVR procedure. One patient underwent semi-elective surgery 14 months later due to dislocated TAVR prosthesis and severe paravalvular leakage and hemolysis. The mean age was 83±6.2 years, and the pre-TAVR EuroSCORE II was 3.4±1.8 %. Perioperative data are summarized in Table 1.

Results: All patients undergoing conventional SAVR using cardiopulmonary bypass and arrested heart. The TAVR protheses were carefully separated, collapsed and removed, followed by excision of the native aortic valves. In the first case, the leaflets of the primary TAVR prosthesis were excised, and the Perceval valve was implanted within the frame of the TAVR prosthesis. In the second case, three longitudinal annular injuries at each aortic sinus were identified and closed with 2x 3/0 pledged sutures before implanting the new valve. After sizing the annulus for the Perceval Plus prosthesis, three 3/0 sutures were placed at the nadir of each aortic sinus and attached to the guiding points of the Perceval valve. Before deployment, the guiding sutures were fixed at the annulus, thereafter, balloon expansion was conducted twice for 30 seconds. Echocardiography confirmed well-functioning protheses with no central or paravalvular leakage.

Conclusions: The demand for surgical solutions after failed TAVR is growing, especially in elderly, multimorbid, and high-risk patients who require a swift procedure. Rapid-deployment valves offer faster solutions. In this modified technique, fixing the three guiding sutures during Perceval valve deployment ensures proper implantation and prevents prosthesis dislocation. This technique offers a promising faster approach in addressing post-TAVR complications.

SURGICAL TREATMENT OF INFECTIVE ENDOCARDITIS IN HEMODIALYSIS PATIENTS

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Background: Patients who have chronic kidney disease or are receiving dialysis therapy are at high risk of infection, related hospitalization, and mortality. Infective endocarditis in patients receiving chronic hemodialysis is a very frequent occurrence. Infective endocarditis is a life-threatening infection that contributes to significant morbidity and death in patients undergoing dialysis. Compared with the general population, patients undergoing dialysis are more vulnerable to IE because of their impaired immunity, high prevalence of periodontal disorders, frequent vascular cannulation, and repetitive exposure to non-physiologic dialysates. IE is a serious and potentially lethal infection that has been reported in up to 6% of patients undergoing HD.

Methods: We reviewed our registry of patients with endocarditis to find the patients that were under hemodialysis.

Results: In Albania we have 1250 patients actually in chronic hemodialysis and we suppose 5% of them will develop endocarditis (approximately 60 patients). We have operated 55 patients for infective endocarditis in the last 5 years and 13 of them were on chronic hemodialysis. The aortic valve was involved in the majority of the patients (7 patients), the mitral valve in 3 patients and we had right-sided endocarditis in 4 patients. Hospital mortality was 15,3%.

The diagnosis is complex and its presence should be considered in all hemodialysis patients with bacteremia. Among the general population, surgical indications for IE are clear with a moderate level of evidence. In patients on dialysis, however, the level of evidence is low, and recommendations are weak. Patients undergoing dialysis have more comorbidities and higher perioperative complication risks than the general population.

Conclusions: Because of the high perioperative risk, patients on dialysis who develop IE undergo surgical intervention less frequently than patients with IE and without kidney diseases. Thus, evidence to support the benefit of surgery in such patients is lacking, and the decision regarding whether to perform surgery to treat IE continues to be made on a case-by-case basis.

PULMONARY VALVE LEAFLETS AUGMENTATION WITH AUTOLOGOUS PULMONARY TISSUE FROM THE PULMONARY ARTERY TRUNK IN A PATIENT WITH COMBINED PULMONARY ARTERY STENOSIS.

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The results of complete correction of congenital heart disease in combination with stenosis and/or insufficiency of the pulmonary valve have significantly improved and are accompanied by minimal mortality and decrease in the incidence of complications. At the same time, the search for optimal methods of reconstructive interventions on the pulmonary valve continues, aimed at its preservation or restoration using new plastic materials.

The aim: to present an original method of augmentation of the pulmonary artery (PA) valve leaflets with autologous tissue from the PA trunk in a patient with combined PA stenosis.

Method of implementation: The operation is performed under cardiopulmonary bypass conditions, access was by sternotomy. The PA trunk with branches is isolated. After clamping the aorta and cardioplegia, the PA trunk is opened longitudinally. The PA trunk flap is taken in the area of the anterior and lateral walls of the PA trunk, above the level of the valve ring and at a safe distance from the semilunar cusps, commissures and orifices of the pulmonary artery branches. After commissurotomy of the PA valve, triangular patches of the required size are cut out from the trunk flap, which are used to augment each of the cusps, restoring their cup-shaped form. The commissures between the cusps are strengthened with interrupted sutures. After reconstruction of the PA valve and assessment of its competence, plastic surgery of the PA trunk is performed using a patch from autopericardium. Upon completion of the valve and trunk reconstruction and prevention of air embolism, the clamp is removed from the ascending aorta, cardiac activity is restored, and the remaining actions are performed in accordance with the protocol for completing the operation under cardiopulmonary bypass conditions.

Clinical example: The patient is 10 years old, with the diagnosis: Combined pulmonary artery stenosis, after balloon of pulmonary artery stenosis, a multicomponent reconstruction of the pulmonary artery valve was performed; excision of infundibular stenosis with plastic surgery of the right ventricle and the PA trunk with 2 separate patches.

Results: The pressure before operation was 120 in the RV and 29/14 (average 20) mmHg in the PA; after correction, it was 40 in the right ventricle, 25 in the pulmonary artery. The early postoperative period proceeded without complications. The duration of mechanical ventilation was 2 hours. The patient was discharged from the hospital on the 10th day. According to the echocardiography before discharge: LVEF - 60%; pulmonary artery valve insufficiency - 1st grade, pulmonary artery valve gradient 19 mmHg. After 2 years: NYHA functional class I, ECG - sinus rhythm with a HR - 68 beats per minute, normal position of the electrical axis, PQ - 0.12 sec, QRS - 0.08 sec. Echocardiography: RV-PA gradient was 23

mmHg, PA valve insufficiency was up to 1-1.5 grade, PA valve leaflets were mobile. The right heart chambers were not dilated, tricuspid valve insufficiency 1st grade, LVEF was 69%.

Conclusion: The proposed method of augmentation of the pulmonary artery valve leaflets with autologous pulmonary tissue from the PA trunk while preserving the patient's own valve is an alternative to reconstructive surgeries on the pulmonary valve. Autologous pulmonary tissue can be used as a plastic material for the pulmonary valve reconstruction.

THE BENEFITS OF REDUCED CARDIOPLEGIC CIRCUIT FOR HEART SURGERY IN INFANTS

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Aim: Reducing negative consequences of cardiopulmonary bypass through optimizing the blood cardioplegia (BC) in children with low body weight.

Material and methods: In order to shorten the cardioplegic line was proposed reduced circuit (RC), which includes two shunts 1/8x1/32 with a whole filling volume of 14ml. For comparasion, the standard circuit (SC) includes the roll pump, a tube 3/16, the filling volume - 80ml The first shunt is connected to the syringe pump with KCl (2Meq/ ml) and the second shunt to cardioplegic cannula. Blood flow was provided from oxygenator. Cardioplegic effect in RC group (15 patients) was compared with that of cadioplegia administered by SC (16 patients). Patients were aged 7-14 months, body weight less than 10 kg. Investigation's data and cardiopulmonary bypass duration showed no significant differences between groups. Ventricular septal defect repair was performed in all cases. We compared cardiac stop setting time, priming volume, amount of red cells concentrates administrated to achieve a hematocrit of 30.

Results: The volume of priming used in SC group was higher than in the RC group (350:250). Administration of BC through RC assured installation of cardiac arrest in 29±13 sec., significantly lower time than in the SC group, 45±11 sec. In order to obtain the target hematocrit of 30, SC group received more red blood cells concentrate in comparison with SC (130,5±16,3ml vs 95,8±20,6ml). The management of cardioplegia through RC proved to be much simpler.

Conclusions: The RC for BC administration in children with low body weight has several benefits: reducing of priming volume, less autologous blood usage, less contact with the artificial surface and provides a quicker cardiac arrest. At the same time, RC reduces costs of supplies, as well.

TITLE:NOVEL PORCINE MODEL WITH CHRONIC LATE LOADS VS. EARLY LEFT VENTRICULAR AFTERLOAD INCREASE IN MODERATE STENOSIS

Sofija Popevska

Background: there is need of testing catheter-based assessment of aortic and LV end-systolic elastance in SD with DD from ESPVR assessment to be compared with noninvasive MRI assessment of LV dysfunction in AS and arterial hypertension. Herein, increased LV afterload, is related to development early systolic HF, and relate end-systolic LV load with development earlier systolic LV dysfunction, with VAs occurrence, being result from increased ascending aortic compliance.

Objective: to create stage B porcine model with different (late vs. early) peak in afterload having mild to moderate descending thoracic vs. ascending aorta stenosis, so to assess early asc. aortic compliance with pressures and LV systolic dysfunction in the 4th and 8th week, from central pressures and ESPVR P-V vs. cMRI assessment in diastolic dysfunction.

Methods: twenty-one domestic male pigs throughout left posterolateral thoracotomy underwent ascending aortic banding for chronic early LV load increase (AB=10) or descending thoracic aorta banding to create late systolic LV load (DB=11). In fourteen, cMRI with left ventricular and aortic invasive pressure-volume measurements (between 4th and 8th week) had assessed diastolic and LV systolic dysfunction between late vs. early LV afterload. Two-way repeated measurement ANOVA, post-hoc Tukey test and linear regression were performed for statistical data analysis in R studio. Results presented are means±SEM or median (quartiles), for significant $p<0.05$.

Results: in different peak LV afterload, having mild to moderate ascending compares to descending thoracic aorta stenosis did not show different LVEF, and ELV with Ves0 indexed per BSA (m^2) for diastolic in systolic LV dysfunction assessment in the 4th or 8th week, though difference in preload ($p<0.05$). Aortic pulse pressure and systolic pressure were not different. ESAP with DAP reduced in ascending stenosis that were different in the 8th week compares to LL and MAP. These are related to early VAs in moderate stenosis. Ascending aortic compliance was reduced in moderate ascending vs. descending aortic stenosis having associated difference in Asc.aortic dpdtmin being more positive in AB vs. DB at 4th vs. 8th week.

Conclusion: in catheter-based assessment of LV DD, novel porcine model was created to assess early SD from LV and asc.aortic elastance. It does not have different ELV, Ves0 or LVEF in DD, but difference in DAP and end-systolic aortic pressure with asc.aortic dpdtimin for aortic compliance between mild to moderate descending thoracic vs. ascending aorta stenosis, as relevant for early LV ischemia in AS or HTA. This showed associated increase for Asc.ao. dpdtmin in EL with reduced compliance indicating more compliant ascending aorta in LL at 4th and 8th week in catheter vs. cMRI assessment of early changes in aortic and LV stiffness.

SURGICAL REPAIR OF POST INFARCT VENTRICULAR SEPTAL RUPTURE IN PESHAWAR INSTITUTE OF CARDIOLOGY: EXPERIENCE IN A NEWLY ESTABLISHED TERTIARY CARE

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Aim-Objective: Ventricular septal rupture is rare but fatal complication of acute myocardial infarction with high surgical mortality. Its incidence is more in those patients who do not have reperfusion therapy after MI. Timing of surgery is important determinant of survival. Therefore we want to share our experience of post infarct closure of ventricular septal rupture in newly established cardiac center.

Methods: This was a retrospective study conducted in cardiac surgery Department of Peshawar Institute of Cardiology from Jan 2021 to August 2024. All VSR repair cases done during this period were included which were 10.

Results: A total of 10 cases of surgical repair of VSR were included in the study. 50 % were males. Mean age was 65 years (IQR 14.7). 40 % were diabetic while 80% were hypertensive. 20% patients had thrombolysis while 60% had PPCI. 50 % patients presented with NYHA IV symptoms. 10% patients were in pre operative AKI. 40% were in cardiogenic shock. 10 % had pre operative IABP passed while 50 % were stabilized with preoperative ionotropic support. 90% of VSR were anterior while 10% posterior. Median VSR size was 13.5 mm (IQR 12.2mm). 20 % VSR were multiple. Median time from onset of symptoms to VSR was 4 days (IQR 2.5). Median time from hospital presentation to VSR repair was 15 days (IQR 20.7). Concomitant CABG was performed in 90% cases. Post operative median ICU stay was 4 days (IQR 4.7) while hospital stay was 7 days (IQR 7.2). Residual VSR, pleural effusion , reopening, post Operative AKI, stroke and heart failure each were present in 10% cases. In hospital mortality was 10%.**Conclusion:** Optimal timing of surgery and preoperative status of patients are important determinant to decrease postoperative complications and mortality.

Table 1: Preoperative variables of Patients (n=10)

Variables			
Gender		Male=5(50%)	Females=5(50%)
	Diabetes Mellitus	Diabetic =4(40%)	Non diabetic =6(60%)
	Hypertension	Hypertensive=8(80%)	Normotensive =2(20%)
	AKI	Yes =1(10%)	No= 9 (90%)
	Reperfusion	Thrombolysis= 2(20%)	PPCI=4(40%)
	Symptoms	NYHA IV=5(50%)	NYHA III=4(40%
	Cardiogenic shock	Yes=4(40%)	No=6(60%)
	Pre op IABP	Yes=1(10%)	No=9(90%)
	Pre operative ionotropic support	Yes =5(50%)	No=5(50%)
	Status of surgery	Urgent =8(80%)	Elective= 2(20%)
	VSR type	Apical Anterior= 9(90%)	Basal Inferior =1(10%)
	Number of VSR	Single= 8(80%)	Multiple= 2(20%)

Table 2: Distribution of preoperative, operative and post operative quantitative variables

	N	Minimum	Maximum	Median	IQR
Age	10	44	70	65	14.7
BMI(kg/m$^{2)}$	10	22	27	23.6	2.3
EF (%)	10	33	50	39	11.0
VSR size (mm)	10	8	30	13.5	12.2
Time from symptoms to VSR (days)	10	2	7	4	2.5
Pre op ICU or HDU stay	10	1	6	3	2.5
Time from presentation to surgery (days)	10	2	38	15	20.7
Cross clamp time (min)	10	108	240	159	56.0
CBP time (min)	10	133	311	188	82.7
Ventilation time (hours)	10	4	190	7.5	8.0
Post Op ICU stay (days)	10	2	22	3	4.7
Post Op hospital stay (days)	10	4	24	7	7.2

CHRONIC PACEMAKER LEAD PERFORATION INTO THE RIGHT VENTRICLE: A RARE CAUSE OF PERICARDIAL EFFUSION AND CHEST PAIN

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Background: Pacemaker lead perforation is a rare but critical complication, with a general prevalence of 0.1-6%. Chronic perforation, defined as occurring more than 30 days post-implantation, is even rarer, affecting less than 1% of patients. We describe a rare instance of lead perforation into the right ventricle, resulting in a pericardial effusion.

Case Report: A 63-year-old female with paroxysmal atrial fibrillation managed with apixaban status post biventricular pacemaker implantation a year ago presented with persistent chest pain and worsening dyspnea over the past week, accompanied by bilateral lower extremity pain. She reported a persistent "poking" sensation in her chest, particularly with movement. Vitals were stable and afebrile. On physical exam, patient had significant mottling of the lower extremities. Laboratory examination was significant for elevated leukocyte count. CT scan of the chest with contract revealed perforation of the right ventricular wall by the pacemaker lead, with a moderate pericardial effusion without tamponade. Patient was admitted to the intensive care unit for monitoring and potential surgical intervention. A decision was made to proceed with thoracotomy to extract and replace the right ventricle lead and repair the myocardial wall. Inspection revealed that a ventricular lead had perforated through the apical region of the right ventricle adjacent to the septum. Surgical intervention, including lead extraction and myocardial repair, was successful. Postoperative echocardiography confirmed a stable pericardial effusion without progression. Chronic right ventricular lead perforation, though uncommon, requires rapid identification and a thorough risk assessment. Through this case, we emphasize the need for heightened clinical awareness in the management of patients with implanted cardiac devices. It is crucial to maintain vigilance in pacemaker-dependent patients presenting with chest pain, as even though perforation is rare, it is a life-threatening complication that can present in a variety of ways, from stable cases with chest pain, as in our patient, to hemodynamically unstable cases with tamponade.

MULTIVALVULAR INVASION AND MANAGEMENT OF INFECTION: CHALLENGE AND SURGICAL STRATEGIES

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Objective: The aim of the study is to highlight the challenges faced by vascular surgeons when performing procedures in cases of multivalvular disease and active infection, such as multivalvular heart disease and the need for multiple heart valve replacement.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane, etc.

Results: Multivalvular disease makes the procedure extremely demanding, as it requires the simultaneous replacement of multiple valves and the treatment of extensive tissue damage. The presence of active infection adds even greater difficulty to the approach, requiring eradication of infected tissues and increasing the risk of postoperative complications, such as recurrence of infection, multiorgan failure and increased mortality. In these cases, extracorporeal membrane oxygenation (ECMO) is often necessary. In addition, surgery usually involves the replacement of multiple valves (e.g., aortic, mitral, tricuspid, and pulmonary) and the use of biological or mechanical grafts, depending on the patient's condition and life expectancy. In addition, antibiotic therapy is crucial, both before and after surgery.

Conclusions: The management of multivalvular disease and active infection requires a specialized surgical approach and careful monitoring. The use of extracorporeal membrane oxygenation and the selection of appropriate grafts are critical aspects of the procedure.

BLEEDING AND VASCULAR HAZINESS FOLLOWING MANTA CLOSURE DEVICE DEPLOYMENT: A CASE REPORT ON COMPLICATIONS AND MANAGEMENT

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Background: The Manta vascular closure device (VCD) is commonly used to achieve hemostasis after large-bore arteriotomies, particularly in transcatheter aortic valve implantation (TAVI). However, complications such as bleeding and improper device apposition can occur.

Case Presentation: We report the case of a 76-year-old female with severe symptomatic aortic stenosis who underwent elective TAVI. The procedure was successfully performed using a transfemoral approach with direct Evolut Pro 26 mm implantation. Arteriotomy closure was attempted using an 18 Fr Manta device. Post-deployment imaging revealed haziness at the deployment site with normal distal flow. Over time, the patient developed worsening access-site bleeding, raising concerns regarding incomplete anchor apposition to the arterial wall. Intervention with hydrophilic wire crossing and peripheral balloon dilation (7 mm) failed to resolve the issue and exacerbated bleeding. Ultimately, prolonged inflation of a 7 mm balloon (~10 minutes) achieved complete hemostasis, allowing for an uneventful recovery.

Conclusion: This case highlights a suspected abnormal orientation and incomplete apposition of the Manta device anchor, leading to persistent bleeding and vascular haziness. Balloon inflation may have displaced the anchor, but prolonged inflation was effective in achieving hemostasis. Awareness of such complications and their management strategies is crucial for optimizing post-procedural outcomes in patients undergoing TAVI.

EMPHYSEMATOUS CHOLECYSTITIS AS A PREOPERATIVE COMPLICATION IN TRIPLE VALVE REPLACEMENT: A CASE REPORT AND LESSONS LEARNED

Laura Rodríguez-Chávez, Ana Castillo-Choy, Victor Pérez-Meza , Jorge Gómez-Reyes, Pamela Ramírez-Rangel

Adults Cardiology, Instituto Nacional de Cardiología Ignacio Chávez

Background: Triple valve replacement (TVR) has predominantly been performed in patients with inactive rheumatic heart disease (RHD) (1). TVR accounts for <2% of all valvular surgeries, with an operative mortality rate ranging from 7.9% to 16.1%. Emphysematous cholecystitis is a rare and prognostically poor condition, representing 1-2% of all acute cholecystitis cases. In cardiac surgery, it typically occurs postoperatively (2).

Case report: A 55-year-old woman with a history of rheumatic fever at the age of 5 years. She has been followed at the institute since 2007 for rheumatic heart disease, presenting with mitral, aortic, and tricuspid valvulopathy, atrial flutter, and atrial fibrillation (AF). She was considered a candidate for triple valve surgery (TVR). In January 2024, she was admitted for decompensated heart failure and complete atrioventricular block, which resolved after discontinuing digoxin and metoprolol. Echocardiography revealed dilation of all four cardiac chambers, severe stenosis and moderate regurgitation of the mitral and aortic valves, besides severe tricuspid regurgitation, and a left ventricular ejection fraction (LVEF) of 59%.

Subsequently, she was readmitted for decompensated heart failure and oral intolerance. During her hospital stay, emphysematous cholecystitis was diagnosed and confirmed by abdominal ultrasound (USG); treatment with tigecycline was initiated. After multidisciplinary evaluation, she was accepted for TVR surgery with high risk of morbidity and mortality. The surgery included aortic valve replacement with a 19 mm SJ Masters mechanical prosthesis, mitral valve replacement with a 25 mm SJ Masters mechanical prosthesis, tricuspid valve replacement with a 33 mm SJ Epic Plus bioprosthesis, left atrial appendage exclusion, and left atrial reduction.

The patient showed clinical improvement postoperatively. Follow-up hepatic and biliary USG revealed cholelithiasis without cholecystitis and complete resolution of perihepatic and perisplenic fluid. Given her hemodynamic stability, oral tolerance, and resolution of cholecystitis, she was discharged with a pharmacological regimen including dapagliflozin, spironolactone, furosemide, and acenocoumarol. During a recent outpatient consultation, the patient reported being asymptomatic, classified as NYHA functional class II. A beta-blocker was added, and the anticoagulant dose was adjusted.

TVR is a complex procedure. Preoperative cholecystitis in this context significantly complicates perioperative management due to systemic inflammation, increasing morbidity and mortality. Timely identification and proper management of acute cholecystitis are essential to optimize surgical outcomes and reduce complications.

TRICUSPID VALVE INFECTIVE ENDOCARDITIS IN A 24 YEAR OLD PATIENT WITH VENTRICULAR SEPTAL DEFECT

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Background: Congenital heart disease is a well-known lifelong risk factor for infective endocarditis. Tricuspid valve involvement is mostly seen in ventricular septal defects, often complicated by pulmonary embolism.

Case Presentation:A 24-years old male was admitted to our emergency department presenting with fatigue, dyspnea, and persistent fever. His medical background included some type of congenital heart defect (undefined from the family), urinary tract infections with repetitive fever in the past 6 months. Upon arrival in the emergency room, physical examination revealed temperature 38°C, regular but tachycardic (120 beats per minute) rhythm, 3/6 holosystolic murmur in the third left intercostal space. Laboratory tests showed severe anaemia (Hb 5 g/l) increasing of WB (white blood cells), C-reactive protein (CPR) and elevated serum urea and creatinine (6 mg/dl). According to patient's clinical history test results, she was referred to nephrology ward for further investigations.

A transthoracic echocardiography demonstrated the presence of a small (7 mm) peri-membranous ventricular septal defect, severe tricuspid regurgitation with rupture of the septal leaflet and the presence of the vegetations on the ventricular side of the valve (large mass 20x 13 mm with irregular margins) attached to the septal leaflet. The heart was enlarged with biventricular dilatation and elevated pulmonary pressures. After a suspicion of infective endocarditis of the right side of the heart, the patient was treated with antibiotic triple therapy for a period of two weeks and after improvement in the renal and haemoglobin levels he underwent cardiac surgery. The ventricular defect was closed with autologous pericardial patch and tricuspid complex valvuloplasty was real success of the operation.

Postoperative recovery was uneventful and the patient left the hospital in good conditions ten days after surgery. He received antibiotics for another three weeks and on control laboratory data were normal except a slightly elevated serum creatinine. The tricuspid valve had minimal regurgitation and no residual septal defect was detected on echocardiography.

Conclusion: Even nowadays in the era of modern medicine, we should forget an unfollowed congenital heart disease as a predisposing condition for infective endocarditis. A multi-disciplinary team is effective in treating this complex pathology and achieve good results. We had a successful treatment of this patient especially in terms of surgery where we realised a good tricuspid valve repair.

MYXOMA OF THE MITRAL VALVE: AN EXCEPTIONAL LOCALIZATION

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Backround: Myxoma is a benign cardiac tumor characterized by an important clinical polymorphism. The most frequent localization is the left atrium with an implantation on the interatrial septum. The valvular localization is exceptional.

Case report: We report a case of patient 63-year-old with big myxoma of the mitral valve implanted on the anterior leaflet. The diagnosis has been done by transthoracic echocardiography after a stroke episode and an atrioventricular block. The patient underwent cardiac surgery under cardiopulmonary bypass. A mitral bioprosthesis replacement n°=27 by sternotomy has been done. The dosage of interleukin 6 was 64 pg/ml. The anatomopatholgy confirm the diagnosis of myxoma .The postoperative course was favorable and patient left the hospital at 7-day without any complication's. At our knowledge, no similar case was reported in the literature.

Keywords: Myxoma, Mitral Valve, Cardiopulmonary bypass, Interleukin 6, Pathology.

Saturday May 17,2025
Conference Room 2
15.00 - 16.25

TREATMENT OF AORTIC DISSECTION TYP B USING STABILISE TECHIQUE- SINGLE CENTER EXPERIENCE

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The goal of endovascular treatment of type B aortic dissection, in addition to covering the proximal entry and establishing adequate flow through the true lumen, is also to prevent late complications - aneurysmal dilatation of the thoracic and abdominal aorta. Since 2012, the STABILISE technique has been used, which involves implantation of the bare stents distally from proximal stent graft into the visceral aorta and ballooning the stents until the lamina ruptures achieving "single channel" aorta. The aim of this work is to present the initial results of using STABILIZE technique in patients with acute aortic dissection

Material and methods: A retrospective, observational study conducted at the Clinic for Vascular and Endovascular Surgery of the University Clinical Center of Serbia in the period from 2022-2025. All subsequent patients (22) were included in the study. The indication for the treatment of these patients were the initial signs of complicated dissection (rupture, visceral malperfusion, ischemia of the lower extremities), a significant increase in the diameter of the aorta at the follow-up examination, persistent pain and refractory hypertension. All patients were treated under general anesthesia and in most cases with drainage of cerebrospinal fluid. Analyzing pre-, intra- and postoperative data as well as follow-up, we monitored survival, the existence of internal medicine as well as early and late complications related to the procedure itself.

Results: The average age of the patients was 57.5 years, predominantly male patients, in a ratio of 2:1. Most patients were treated in the acute phase (N=18), while three patients (14.2%) were treated in the subacute phase. The average time from the onset of symptoms to the procedure was 4.1 days. Two (10%) patients out of 21 had a previous cardiac surgical intervention due to type A dissection. In most cases, additional proximal debranching was performed that includes carotid subclavian bypass (N=13, 62%), carotid-carotid subclavian bypass (N=1, 4.7%). Intra hospital survival rate was 90.5%, with two deaths. All patients underwent control MDCT angiography during hospitalization, based on which in one case, an additional endovascular procedure was indicated. Intra hospital cardiac, renal (N=1), and pulmonary complications (N=1) were analyzed. Through six-month follow-up and MDCT angiography, no significant complications related to the procedure were observed.

Conclusion: Initial results of this small cohort are promising and in line with other published experience. For a more detailed and definitive assessment of postoperative complications as well as aortic remodeling, a longer follow-up period and MDCT follow up are required.

MID-TERM OUTCOMES OF XENOPERICARDIAL ROLL GRAFT REPLACEMENT FOR NATIVE AORTA AND AORTIC GRAFT INFECTION

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Background-Aim: This study aimed to evaluate the feasibility and mid-term outcomes of in-situ aortic reconstruction using xenopericardial grafts for treating native aortic and aortic graft infections.
Methods: This retrospective study included consecutive patients who underwent xenopericardial roll graft replacement with or without branched grafts and tissue filling between 2010 and 2024. A multidisciplinary approach, including preoperative mediastinal continuous irrigation and negative-pressure wound therapy, was adopted. Perioperative and mid-term outcomes, including mortality and graft-related complications, were assessed.
Results: A total of 21 patients (22 procedures) were included (median age: 67 years, IQR 63.75-73.75). Infectious aortic aneurysms were present in 3 cases, while 19 cases had graft infections. The extent of aortic replacement included the ascending aorta (5 cases), arch (11), descending aorta (6), and thoracoabdominal aorta (1). Tissue filling was performed in 11 cases. The 30-day mortality was 13.6% (3/22), and the overall operative mortality was 18.2% (4/22). Aorta-related mortality occurred in 10.5% (2/19) due to fungal reinfection, while 17 patients (89.4%) remained free of re-infection. The median follow-up was 53.6 months (IQR 20-80.5), with a maximum follow-up of 132 months. The estimated survival rates at 1, 3, 5, and 7 years were 92% ± 8%, 72% ± 11%, 58% ± 16%, and 36% ± 24%, respectively. The cumulative aorta-related mortality rates at these time points were 94% ± 6%, 87% ± 9%, 87% ± 9%, and 87% ± 9%, respectively. Graft-related complications included branch kinking (1 case), graft rupture (1 case), and pseudoaneurysm formation at the xenograft suture line (3 cases). No thromboembolism or graft calcification was observed.
Conclusion: Xenopericardial roll graft replacement, when performed with a multidisciplinary and staged approach, appears to be a viable treatment for native aortic and aortic graft infections, despite potential susceptibility to fungal reinfection.

CHALLENGES IN THE MANAGEMENT OF AORTO-ESOPHAGEAL FISTULAS. SHORT CASE SERIES

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Background: Aorto-esophageal fistulas are mostly related to aortic aneurysms. However, an increasing incidence after endovascular treatment for aortic diseases has been reported. We present a series of 3 patients emphasizing on the management challenges and the septic complications that may occur.

Case reports:A 70 year old male presented with an aorto-esophageal fistula due to esophageal erosion by a descending thoracic aorta aneurysm. A synthetic graft was used to bypass the aneurysm followed by debridement of the sac and suture ligation of intercostals vessels. Bipolar esophageal exclusion was followed by gastrostomy and neck esophagostomy. The patient suffered of septic complications treated with antibiotics and tube thoracostomy. Three months later he underwent restrosternal gastric pull up.

A 58 year old male was admitted with an aorto-esophageal fistula due to late traumatic pseudoaneurysm at the mid portion of the descending aorta. He underwent endovascular treatment. He was re-admitted after 3 months with fever. Chest computed tomography with contrast swallow revealed re-activation of esophageal fistula (figure 1). After debridement of the posterior mediastinum, primary repair of the esophageal defect was carried out with an intercostal muscle flap placed between the esophagus and the aorta. Postoperatively he underwent 6 week antibiotic treatment.

A 77 year old male presented with recurrent aortoesophageal fistula after previous endovascular treatment, complicated by penetrating atherosclerotic ulcer. The patient underwent uneventful Bavaria type I aortic repair (figure 2). Fifteen days later bipolar esophageal exclusion and retrosternal gastric pull up was carried out to avoid stent graft contamination and septic complications.

These cases highlight the complexity in the management of such challenging problems, the risk of contamination of the grafts used and the need for collaboration between cardiovascular and upper gastrointestinal surgeons.

AN ANALYSIS OF EARLY AND LONG-TERM AORTA-RELATED OUTCOMES AFTER THORACIC ENDOVASCULAR AORTIC REPAIR IN LARGE (>7CM) THORACIC AORTIC ANEURYSMS

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Background: Large (>7cm) thoracic aortic aneurysms are uncommon. They have not been adequately analyzed after thoracic endovascular aortic repair (TEVAR) as separated entities, and analyses stratified for aortic diameter are almost missing making the potential impact of diameter on aortic-related outcomes a pending matter. The aim of this paper was to analyze the results of TEVAR in large thoracic aortic diseases (TAD) in a single center institutional experience.

Methods: It is a single center, retrospective, observational cohort study. All TEVARs between February 2001 and August 2024 were identified: we excluded blunt trauma, rare aortic diseases, and those lost to follow-up. Patients were stratified according to a coarsened exact match based on the baseline diameter of the aortic lesion (threshold: 7cm). Primary outcomes were in-hospital and cumulative survival. Secondary outcomes were freedom from endograft fistulization/ infection, and TEVAR-related reintervention.

Results: We analyzed 171 patients: 86 (50.3%) had TAD <7cm, and 85 (49 .7%) had TAD >7cm. The underlying aortic disease was degenerative atherosclerotic in 126 (73.7%), and dissection-related in 45 (26.3%) being less frequent in TAD>7cm (OR: 2.2, P = 0.037). Patients with TAD>7cm required >2 endograft more frequently (67% vs. 38.5, P = 0.001). Major postoperative complication and in-hospital mortality did not differ between the two groups (OR: 0.8, P = 0.595, and OR: 2.2, P = 0.108, respectively). While overall survival was significantly lower in TAD >7cm (Breslow = 7.8, P = 0.005), we observed similar results in terms of aorta-related mortality (Breslow = 0.2, P = 0.681), freedom from endograft fistulization/infection (Breslow = 0.4, P = 0.390), freedom from aorta-related adverse events (Breslow = 0.02, P = 0.885), and freedom from aorta-related reintervention (Breslow = 0.5, P = 0.487). At Cox's regression analysis, only age (HR: 1.05, 95%CI: 1.05-1.1, P = 0.010) was associated with increased mortality, while diameter did not impact on survival.

Conclusions: A pre-operative TAD diameter >7cm has not a direct impact on early technical and clinical outcomes.

BARORECEPTORS IN HUMAN AORTIC ARCH

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Baroreceptors are mechanosensitive ion channels playing a key role in regulating blood pressure and heartbeat. However, the current knowledge of baroreceptors is based only on animal experiments. No studies have yet focused on the molecular nature of baroreceptors, particularly, in the human aortic arch. To address this lack of knowledge, comprehensive histological, proteomic, and transcriptomic analyses of aortic specimens were performed to identify potential baroreceptors in humans.

For the study, formalin-fixed in paraffin embedded (FFPE) as well as fresh-frozen tissue samples from healthy and diseased human aortic arches and aortas were used. Tissue was characterised using haematoxylin-eosin and elastica van Gieson's stains. For immunohistochemistry, antibodies against various neuronal markers were applied. Proteome and transcriptome analyses were performed on FFPE and fresh-frozen samples using laser microdissection as well as microdissection of the adventitial layer, which contains the nerves of interest.

Histological examination revealed a heterogeneous dissemination of nerves within the adventitia of the aortic arch, with their highest concentration in the ascending aorta up to the left subclavian artery. Interestingly, the proteome analysis identified only three ion channels that might serve as baroreceptors in humans, PIEZO1, TRPV2, and TRPM4. Surprisingly, these three putative human baroreceptors were detected not only in the aortic arch but also in the abdominal aortic aneurysms, as well as in the healthy abdominal aorta. In addition, no significant differences were observed in their abundance between healthy and diseased aortic arch and aorta. Furthermore, transcriptomic analysis did not show any of these baroreceptor candidates at the RNA level.

This study provides the first evidence of putative baroreceptors in the human aortic arch. The absence of mRNA likely reflects the translation of these genes into proteins in the neuronal cell bodies within the brainstem. Surprisingly, the same baroreceptors were also detected in the abdominal aorta without significant differences in their expression between healthy and diseased vessels. Further research is needed to confirm these findings and investigate the functional role of these potential baroreceptors in regulating blood pressure and heart rate in the human aortic arch.

ENDOVASCULAR AND HYBRID REPAIR FOR AORTIC PATHOLOGIES - SINGLE CENTER EXPERIENCE

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Background-Aim: Endovascular and hybrid techniques are increasingly used for the management of aortic diseases including complex aortic pathologies. We present our experience on endovascular and hybrid repair of the aorta.

Methods: Retrospective analysis. End points included mortality, morbidity and long term outcome. Statistical analysis was performed using the chi square and Fischer exact tests for categorical variables, while the Kaplan Meier analysis and the log rank test were applied to define long term outcome. P values < 0.05 were considered statistically significant.

Results: The study includes 73 patients (mean age: 59±18 years). Indications comprised: traumatic aortic injury (24), aortic aneurysm (29), type B dissection and intramural hematoma (17), penetrating atherosclerotic ulcer (1) and aorto-esophageal fistula (2). Urgent surgery was undertaken in 37 patients. Seven patients presented with contrast media extravasation. Eight patients had complex aortic pathology. Hybrid techniques (figure 1) were used in 16 patients. Endovascular prosthesis was deployed antegrade in 9 patients. In hospital mortality was 9.6%. A total of 96 complications were recorded. Endoleak occurred in 8 patients. Early mortality was related to chronic lung disease (p: 0.022), preoperative renal impairment (p: 0.036), postoperative respiratory, cardiovascular and renal failure (p values of 0.012, < 0.001 and 0.005 respectively), infection (p: 0012) and perioperative bleeding (p: 0.008). Hypertension and urgent surgery had a marginal, not statistically significant impact on early mortality. The 5 year overall and cardiovascular event free survival was 82.3% and 92.1% respectively (figure 2). Factors affecting survival included: aneurysm (p: < 0.001), hypertension (p: 0.008), diabetes (p: 0.034), ischemic heart disease (p: 0.027), hyperlipidemia (p: 0.039), postoperative cardiovascular failure (p: < 0.001) and urgent surgery (p: 0.008).

Conclusions: Endovascular and hybrid repair of the aorta can be performed with acceptable mortality and excellent long term outcome. It's a valuable tool for treating urgent and/or complex aortic pathologies.

COMPARATIVE SURVIVAL ANALYSIS AND HAEMODYNAMIC CHARACTERISTICS OF SUTURED AND SUTURELESS BIOPROSTHESIS IN TREATEMENT OF PATIENTS WITH ISOLATED SEVERE AORTIC STENOSIS

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Aim:The primary end point of this study was to compare the survival of people with isolated severe aortic stenosis after the implantation of conventional - sutured and a new sutureless (Perceval) bioprostheses in a tertiary referral center in Serbia. There is a lack of data about the survival of patients after the implantation of sutureless relative to conventional bioprostheses in middle-income settings. The secondary end point was to compare the haemodynamic characteristics of these two types of valves both at discharge and after the follow-up period.

Materials and Methods: This retrospective cohort study included all people treated for isolated severe aortic stenosis with sutureless and stented bioprostheses from 1 January 2018 to 1 July 2021 at the Institute for Cardiovascular Diseases "Dedinje". Demographic, clinical, perioperative and postoperative data were extracted from the medical records. The follow-up lasted for a median of 2 years.

Results: The study sample comprised a total of 238 people with a sutured (conventional) bioprosthesis and 101 people with a sutureless bioprosthesis (Perceval). Over the follow-up, 13.9% of people who received the conventional and 10.9% of people who received the Perceval valve died (p = 0.400). No difference in the overall survival was observed (p = 0.797). The multivariate Cox proportional hazard model suggested that being older, having a higher preoperative EuroScore II, having a stroke over the follow-up period and having valve-related complications were independently associated with all-cause mortality over a median of 2 years after the bioprosthesis implantation. Although both valves showed good haemodynamic characteristics, compared to the conventional valve, the Perceval valve had significantly lower mean transvalvular pressure gradients both at discharge (13.58 ± 4.1 mmHg vs. 17.03 ± 6.6 mmHg) and after the follow-up period (12.3 ± 3.7 mmHg vs. 19.0 ± 8.3 mmHg) (p=0.002). However, the occurrence of mild and moderate transvalvular aortic insufficiency was more frequent in the Perceval group after the follow-up period (p=0.017).

Conclusion: This research conducted in a middle-income country supports previous findings in high-income countries regarding the survival of people with sutureless and sutured valves. Survival after bioprosthesis implantation should be monitored long-term to ensure optimum postoperative outcomes.

ENDOVASCULAR TREATMENT OF TYPE B DISSECTION IN THE ACUTE PHASE - RETROSPECTIVE ANALYSIS IN THE TERTIARY CENTER

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Background: Type B aortic dissection presents significant clinical challenges. While uncomplicated cases are often managed with medical therapy, there's a substantial risk of progression to complications like malperfusion or aneurysmal degeneration. Complicated dissections, necessitate prompt intervention, often through thoracic endovascular aortic repair (TEVAR). The timing of intervention, when considering the acute versus subacute phases brings another dilemma. Increasing the risks associated with immediate invasive procedures versus exposing patient to the risk of developing complication during acute phase. Therefore, individualized treatment strategies are essential to optimize outcomes for patients with type B aortic dissection.

Aim of this paper is to present treatment results of patients with acute type B dissection in the aortic center.

Methods: This is a retrospective, single-center study analyzing medical data from patients with aortic type B dissection treated at high-volume aortic center between 2015 and 2024. Indication for endovascular treatment in acute phase was presence of rupture or malperfusion and presence of clinical and morphological features of potentially complicated dissection (entry tear greater than 12mm, compression of true lumen, persistent pain and or hypertension). Medical data was gathered from patient histories, including information on symptomatology, demographic details, treatment approaches, and outcomes. All data has been statistically analyzed.

Results: From year 2015 to 2024 a total amount of 153 patients with type B aortic dissection were treated at our institution with mean age of 58,5±10,3 years old with 77.1% of them being male patients. Highest incidence rate of all comorbidities had arterial hypertension with 99,3%. Complicated dissections were shown in 80 (53.7%) of patients and potentially complicated in 56 (37,8%). There were 16 patients (11.6%) with suspected ruptured dissection. Overall, early mortality rate was 11.2% (17 patients). Most typical clinical symptom on admission was chest pain (50.7%), and most common treatment of complicated dissection was carotid-subclavian bypass and TEVAR (43.7%).

Conclusion: Our retrospective analysis of 153 patients treated for type B aortic dissection over a nine-year period underscores the complexity and heterogeneity of this condition. With over half of the cases presenting as complicated dissections and a notable early mor-

tality rate of 11.2%, the findings highlight the critical importance of timely diagnosis and appropriate intervention. The predominance of hypertension among patients (99.3%) reinforces the need for stringent blood pressure management as cornerstone of both prevention and treatment. Ultimately, individualized treatment strategies, informed by patient-specific factors and disease progression, are essential to optimize outcomes in type B aortic dissection.

COMPARATIVE EFFECTIVENESS AND SAFETY OF DIRECT ORAL ANTICOAGULANTS VERSUS LOW-MOLECULAR-WEIGHT HEPARIN IN UPPER EXTREMITY DEEP VEIN THROMBOSIS: A META-ANALYSIS

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Upper extremity deep vein thrombosis (UEDVT), distinct in etiology from lower limb DVT, often arises from catheter use, malignancy, or thoracic outlet syndrome. While direct oral anticoagulants (DOACs) are established for lower limb DVT, their role in UEDVT remains understudied. This meta-analysis evaluates the efficacy and safety of DOACs compared to low-molecular-weight heparin (LMWH) in UEDVT. A systematic PubMed search identified nine studies (643 DOAC-treated patients). Outcomes included mortality, venous thromboembolism (VTE) recurrence, pulmonary embolism (PE), and major bleeding.

DOACs demonstrated significantly lower mortality (2.49% vs. 16.5-27.5%; $p<0.001$), VTE recurrence (0.93% vs. 5%; $p<0.001$), and PE incidence (0.31% vs. 5-8%; $p<0.001$) compared to historical LMWH data. However, major bleeding rates were higher with DOACs (2.02% vs. 0.25%; $p<0.001$). Patient cohorts predominantly had cancer-related (66.7%) or catheter-associated (64.5%) UEDVT, with rivaroxaban being the most used DOAC (70.9%). Median treatment duration was three months, with six-month follow-up.

These findings suggest DOACs may offer superior efficacy in reducing mortality and thrombotic complications in UEDVT, though with an increased bleeding risk. Limitations include reliance on historical LMWH comparisons, heterogeneity in study designs, and small event counts for PE. Standardized imaging and extended follow-up are needed to assess long-term outcomes. While DOACs present a promising alternative, cautious use in high-bleeding-risk patients is warranted. Further randomized trials are essential to validate these results and refine clinical guidelines.

Thursday May 15,2025
e-posters
Conference Room 2, 09.00 - 10.00

CEREBRAL OXYMETRY IN THE CHOICE OF TREATMENT OF MULTIPLE LESIONS OF THE CAROTID ARTERIES

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Background and Aim: Investigate the role and place of cerebral oximetry in the choice of treatment for patients with multiple atherosclerotic lesions of the carotid arteries.

Methods: The results of surgical treatment of 144 patients with multiple atherosclerotic lesions of the carotid arteries are presented. The effectiveness of cerebral oximetry performed in the preoperative period in predicting the tolerance of the brain to ischemia during surgery was evaluated. The features of cerebral hemodynamics in patients with multiple atherosclerotic lesions of the carotid arteries were studied.

Results: Depending on the degree of damage to the ipsilateral and contralateral carotid arteries, the patients were conditionally divided into 5 groups. When performing cerebral oximetry with compression tests, it was found that in groups I and II, rSO_2 decreased to the minimum values within 10-45 seconds, and then, before the termination of compression tests, rSO_2 returned to the initial values or close to them (within the next 30-60 seconds). In other groups, rSO_2 decreased significantly more, and recovery was much slower than in groups I and II; in patients with an isolated middle cerebral artery, rSO_2 recovery did not occur at all until the compression tests were stopped. In the 1-day of postoperative period, cerebral oximetry showed no changes in rSO_2 both in the operated side and in the intact side. At the same time, there is a 46% decrease in the magnitude of interhemispheric asymmetry compared with preoperative values. By day 3, there was an increase in rSO_2 by 11.5% on the side of the operation compared with preoperative values ($p=0.03$).

Conclusions: Our studies confirm the effectiveness of cerebral oximetry in combination with exercise tests in assessing the brain's tolerance to ischemia and predicting the magnitude of the decrease in regional blood oxygenation of the cortical parts of the brain during carotid reconstruction.

SAFETY OF CAROTID ENDARTERECTOMY IN OCTAGENARIANS

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Aim: Stroke is the third leading cause of death, following heart diseases and cancer. Stroke prevention continues to challenge the best efforts off all the specialists involved in this pathology. Extra cranial carotid occlusive disease is responsible for one third of the patients who have a cerebrovascular event. The optimal therapeutic management strategy remains unclear, especially in octagenarians.

We present the results of 588 patients with symptomatic and asymptomatic carotid stenosis treated by carotid endarterectomy(CEA) and carotid artery stenting(CAS) in one single onstitution.

Method: Between January 2009 and May 2012, 588 patients with carotid artery stenosis were treated in our department by open or endovascular interventions. Preoperative evaluation consisted in Echo2D+ Doppler examination , Carotid angio CT and arteriography in inconclusive cases. 510 patients (70% symptomatic and 30% asymptomatic, with stenosis > 70%) underwent CEA and 78 patients (60% symptomatic and 40 asymptomatic, with stenosis > 70%) underwent CAS. 11% of patients had more than 75 years old.The follow-up was between 1 and 24 months with an average of 12 months. We assessed perioperative and postoperative morbidity and mortality (cerebrovascular event related mortality and all cause mortality)

Results: The morbidity/mortality cumulative percent was 0,8% for CEA patients and 2,5% for CAS patients. There was no statistically significant difference between symptomatic and asymptomatic patient outcomes in both CEA or CAS group.

As comorbidities coronary artery disease was in 19% of cases, atrial fibrillation in 11% , High blood pressure in 54% and Diabetus mellitus in 26%of cases.

In the group of age older than 75 years, the perioperative stroke rate was 1,3% and the mortality 1,9%, so a cumulative percent of 3,2%.The hospital stay was also longer.

Conclusion: Although the octogenarians had slightly higher mortality than younger patients, the absolute risk of mortality was still low at 1.9%. Therefore, CEA is a safe procedure in the treatment of carotid stenosis in octogenarians

DETECTION OF VARIOUS MICROPLASTICS IN HUMAN CAROTID ARTERY PLAQUES-COMPARISON OF TYPE, NUMBER AND SIZE OF MICROPLASTIC-PARTICLES IN CAROTID ARTERY PLAQUES VERSUS PERIPHERAL BLOOD (STUDY-PROTOCOL)

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Background - Aim: Microplastics are plastic particles with a length of less than 5 mm. They are divided into primary and secondary microplastic depending on their origin. Microplastic particles have been detected in human urine, bronchoalveolar lavage fluid, sputum, breast milk, blood, placenta, faeces, lung tissue, colectomy specimens, liver, kidney, spleen and saphenous vein. Until the year of 2024, carotid artery plaques had not been examined for the presence of microplastic particles. In a study by R. Marfella et al in 2024, patients with microplastic particles detected in carotid artery plaques were at higher risk of a combination of myocardial infarction, stroke, or death from any cause after a 34-month follow-up period than those in whom microplastic particles were not detected. We now know that microplastic particles accumulate in human arterial plaques, but we don't know whether the particle size distribution of plaque microplastics is comparable to results from blood. The aim of the planned study is to investigate, if microplastic particles found in carotid artery plaques are equal to those found in peripheral blood concerning particle size and type of microplastic.

Methods: This is a monocentric prospective observational trial at our tertiary university center. The carotid artery plaque will be obtained during the surgical procedure called carotid endarterectomy. Blood samples will be taken by venipuncture and stored in 10 ml heparinized vacutainers maid out of glass. For the latter technique filters will be investigated under a fluorescence microscopy and the chemical composition of detected particles will be measured via Raman spectroscopy. Patients characteristics are evaluated using descriptive statistics. Number, type and size distributions of microplastic particles between carotid plaques, blood and blank samples will be described. Correlations using Spearman correlation test or Chi square test depending on the format of the variable of microplastic particle data with clinical and biochemical will be performed as explorative analysis. The secondary endpoints will be the stratification of the primary endpoint for comorbidities, medical treatment, microplastic intake and lifestyle factors.

Results: It is expected to find out whether there is a difference in the distribution, size and type of microplastic particles in carotid artery plaque and peripheral blood.

Conclusions: If there is a difference, it could be due to the endothelium, which may function as a filter. This could provide better insight into the function of the endothelium.

PECULIARITIES OF SURGICAL TACTICS IN TAKAYASU ARTERITIS OF EXTRACRANIAL VESSELS

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Purpose of the study: To analyze the surgical treatment of NAA patients who underwent surgery for lesions of the brachiocephalic arteries.

Material and methods:A retrospective analysis of the surgical treatment of 66 patients with NAA who were hospitalized at the Republican Center for Surgical Angioneurology and at the Department of Vascular Surgery of the Multidisciplinary Clinic of the Tashkent Medical Academy in the period 2019-2024 was carried out.

Group 1 - open interventions on extracranial vessels - 28 patients: bifurcation aorto-carotid bypass grafting - 8 patients, common carotid artery replacement - 12 patients, subclavian carotid bypass grafting - 8 patients.

Group 2 - endovascular interventions - 20 patients: angioplasty of the vertebral artery (VA) - 6 cases, angioplasty and stenting of the VA - 2 patients, angioplasty of the subclavian artery (SCA) and brachiocephalic trunk - 2 cases, angioplasty and stenting of the CCA - 6 patients.

Group 3 - hybrid interventions - 18 patients: CCA stenting + endarterectomy (EAE) from the CCA and internal carotid artery (ICA) with allo patch - 8 cases, CCA prosthetics + RCA angioplasty - 4 patients, CCA prosthetics + angioplasty and RCA stenting - 6.

Results: In the early postoperative period, operated patients in group 1 had hyperperfusion syndrome - 1 case, ICA thrombosis followed by ischemic stroke - 1 case. In group 3, 1 patient had bleeding from the site of the allo patch.

Conclusion. Thus, our experience of surgical treatment of patients with NAA with multivessel lesions showed that the choice of tactics should be determined individually, while the main principle is the staged correction of circulatory disorders.

ICA RUPTURE AFTER ENDARTERECTOMY WITH PORCINE INTESTINAL SUBMUCOSA EXTRACELLULAR MATRIX (SIS-ECM): A VALUABLE PATCH OR NOT?

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Background: Arteriotomy closure after carotid endarterectomy is typically performed using patch repair, but choosing the right patch remains a clinical challenge. There has been growing interest in biologically derived patches and substitutes. Current evidence suggests that autologous grafts, synthetic, and biologic materials yield similar outcomes. Biologic patches offer several potential benefits, such as a reduced risk of infection, better modulation of the foreign body response, and the ability to remodel into healthy, vascularized tissue. Among these biologic materials, autologous and xenogeneic pericardia, along with porcine intestinal submucosa extracellular matrix (SIS-ECM), are emerging as promising alternatives to synthetic materials for various cardiovascular surgeries.

Porcine intestinal submucosa extracellular matrix (SIS-ECM) patches have shown potential as superior alternatives to synthetic materials for carotid endarterectomy (CEA). However, in the high-pressure environment of the carotid artery, the mechanical strength of SIS-ECM patches may degrade during the remodeling process, leading to patch rupture and pseudoaneurysm formation

Case report: A 77-year-old male with a history of hypertension, dyslipidemia, coronary artery disease, benign prostatic hyperplasia, and prior vocal cord neoplasia presented with 85% asymptomatic stenosis of the left internal carotid artery. He underwent left carotid endarterectomy with an SIS-ECM patch for arteriotomy closure, and the surgery was uncomplicated. The patient was discharged on the second postoperative day and had no issues at his 10-day follow-up, though he reported a severe cough lasting a month.

Two months later, the patient presented with a painful, pulsating mass in the left cervical region and dysphagia. A CT scan revealed a pseudoaneurysm from rupture of the carotid patch.(1) He underwent emergency reconstruction with a saphenous vein patch after shunting. The recovery was uneventful, and tissue cultures were negative for microorganisms. He was discharged on the fourth postoperative day.(2)(3)

STRATEGIC PLAN FOR R0 EXCLUSION OF RETROPERITONEAL MYXOFIBROSARCOMA WITH COMPLETE REPLACEMENT OF THE INFERIOR VENA CAVA

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Backround: Myxofibrosarcomas(MFS) are a specific subgroup of sarcomas that are of fibroblastic origin and are mainly present at the extremities and torso. However, there are reports of myxofibrosarcomas at the retroperitoneal space. Where their large size and proximity to critical vascular structures pose unique surgical challenges. They cause no symptoms and at the time of diagnosis, the patients with retroperitoneal sarcomas may be asymptomatic or may present with a large abdominal mass, abdominal pain, leg swelling and back pain. The diagnosis is crucial for determining a retroperitoneal tumour as myxofibrosarcoma because of the rare location of this subtype.

Case report: A 63-year-old man with dominant symptom of back pain underwent Magnetic Resonance Imaging (MRI) of the abdomen where a lesion 13X13x10 cm displacing the right kidney cranially while abutting the infrahepatic inferior vena cava (IVC). The patient underwent neoadjuvant therapy between December 2023 and March 2024. A midline incision with perpendicular extension to the right lateral abdominal wall up to the level of the lateral abdominal muscles was made. This was followed by Cattell-Braasch manipulation, hepatic mobilization and exposure of the IVC below the vein of the caudate lobe of the liver until the caval bifurcation. We divided and ligated firstly the left renal vein, and secondly the right renal artery. Following I.V. administration of 5.000 IU of heparin, the IVC was cross clamped with double clamps, below liver and just above its bifurcation, and followed its proximal and distal division. The IVC was excluded for 12min and bridged with a tube PTFE graft, with diameter of 18mm. Then, the sarcomas surgeons continued the mobilization of the mass and was removed en *bloc* with the right kidney and the infrahepatic and the suprabifurcation ends of the cross clamped IVC attached with the MFS, portion of the psoas and quadriceps muscles.

RATIONAL AND DESIGN OF A PILOT STUDY ON THE SAFETY AND EFFICACY OF AI-GUIDED ULTRASOUND TO EXCLUDE ENDOTHERMAL HEAT-INDUCED THROMBOSIS AFTER THERMAL ABLATION FOR VARICOSE VEINS

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Background-Aim: Thermal ablation (TA) of the great saphenous vein (GSV), as the main method to treat chronic venous disease (CVD), is associated with a low but calculable risk of deep vein thrombosis (DVT). According to the recent guidelines, patients treated with TA of the GSV, should undergo a standard duplex ultrasound (DUS) at 2-4 weeks to exclude endothermal heat-induced thrombosis (EHIT). The aim of the study is to evaluate the efficacy and cost effectiveness of AI-guided ultrasound to exclude EHIT and confirm successful GSV ablation.

Methods: Patients treated with endovenous laser ablation (EVLA) or radiofrequency ablation (RFA) of the GSV are included in this non-randomized prospective study. A non-expert physician will perform an ultrasound with the use of ThinkSono Guidance System one week and one month after the operation. The images obtained are transferred on the cloud and remotely reviewed by an ultrasound expert. Based on the clinical suspicion and the images obtained, the reviewer decides whether the patients will undergo a standard DUS study. Video loops of GSV before and after the TA will also be obtained to train the software to recognize an obliterated GSV (machine learning). Cost effectiveness will be assessed against the standard practice of a full DUS.

Results: We expect to re-evaluate the role of the DUS after a TA of the GSV to exclude an EHIT event and we anticipate confirming at the same time whether the ablation of the GSV was successful. It is expected that the time and the total cost needed to evaluate the patients with a DUS will be reduced.

Conclusions: Despite EHIT being a rare complication, physicians are suggested to perform a DUS after a TA. An AI-guided ultrasound can simplify the logistics of follow-up after TA of the GSV and reduce the time, the cost and resources needed.

ROLE OF SINGLE PERONEAL VERSUS SINGLE NON-PERONEAL TIBIAL ANGIOPLASTY IN LIMB SALVAGE

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This study included 45 patients presented with critical limb ischemia, they were treated with single angiosome-targeted tibial angioplasty revascularization, they were divided into 13 patients (28.9%) with single peroneal revascularization (group 1) and 32 patients (71.1%) with single non-peroneal revascularization (group 2), 20 patients (44.4%) had target anterior tibial artery, while 12 patients (26.7%) had target posterior tibial artery. The follow-up duration was 6 months. No difference was found in limb salvage between the two groups (92.3% vs. 87.1%; P=1). No differences were found in wound healing rates between the two groups (76.9% vs. 81.3%; P=0.281). The overall 30-day survival rate was 100% in both study groups.

Conclusions: Single peroneal tibial revascularization mostly is non-inferior to single non-peroneal angiosome targeted tibial artery revascularization regarding limb salvage and wound healing for patients with critical limb ischemia.

FEMORAL ARTERY RECONSTRUCTION WITH PROFUNDA REIMPLANTATION USING FEMORAL VEIN INTERPONATION FOLLOWING PROSTHETIC PATCH INFECTION

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Background-Aim: Atherosclerotic lesions at the femoral bifurcation are a common cause of lower extremity claudication and chronic limb-threatening ischemia. Endarterectomy of the common femoral artery and profunda femoris is a well-established procedure with low mortality and morbidity rates, offering excellent long-term patency outcomes. This procedure can also be performed as a hybrid approach, combined with endovascular recanalization of atherosclerotic lesions in the superficial femoral or crural arteries. Arteriotomy closure is typically achieved using autologous or prosthetic patch, as primary direct closure may lead to luminal narrowing. Commonly used materials include saphenous vein or bovine pericardium patches. However, prosthetic patch infections can result in severe complications such as vessel erosion and acute hemorrhage, often necessitating emergency surgical intervention for patch removal and femoral bifurcation reconstruction.

Methods: We present the case of a 68-year old male who was admitted to our emergency department with acute pain in his lower right extremity for the last three to four hours. Past medical history included hypertension, chronic kidney disease and severe alcohol abuse. Computer tomography angiography revealed a complete obstruction of the right common femoral artery due to extensive atherosclerosis. The superficial femoral, anterior tibial and posterior tibial arteries were patent but heavily calcified.

Results: The patient underwent femoral revascularization with closure of the arteriotomy using a biological prosthetic patch. Postoperatively the patient developed a surgical site infection which was primarily managed using antibiotics and negative pressure wound therapy. Despite the applied therapy, patient's condition deteriorated with rising inflammatory markers and purulent discharge from the wound. The patient underwent surgical revision with exposure and complete removal of the femoral bifurcation and the prosthetic patch. Reconstruction was achieved using the distal deep femoral vein from the contralateral extremity, with reinsertion of the profunda femoris in an and-to-side fashion and primary closure of the wound using deep subcutaneous sutures. The postoperative period was uneventful and the patient was discharged on the 8th postoperative day.

Conclusions: Prosthetic graft infection following femoral endarterectomy is a serious complication with high morbidity and mortality rates. Complete removal of the infected vessel segment and prosthetic graft and reconstruction using the deep femoral vein as an interposition graft is a viable approach, effectively minimizing postoperative complications and maintaining vessel patency.

THE INTERNATIONAL, PROSPECTIVE COSMOS (CYTOSORB TREATMENT OF CRITICALLY ILL PATIENTS) REGISTRY: INTERIM RESULTS FROM THE FIRST 230 PATIENTS

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Introduction-The International COSMOS Registry collects real-world data on CytoSorb (CS) hemoadsorption use and outcomes in critically ill patients.

Methods-Since July 2022, the registry has enrolled critically ill patients, including children, treated with CS integrated with standard care. Data were collected at multiple time points: 24 hours pre, during CS therapy, 24 hours post, ICU and hospital discharge, and day 90 follow-up. Results are reported as mean ± standard deviation or median [Q1, Q3].

Results-A total of 230 consecutive eligible patients (33% female, age 59±16 years) from 21 sites in Germany, Italy, Spain and Portugal were included. CS indications included septic (56.6%) or cardiogenic shock (13.1%), rhabdomyolysis (14.0%), acute/acute-on-chronic liver failure (12.2%) and acute respiratory distress syndrome (ARDS; 5%). Mean number of adsorbers used per patient was 3.2 ± 3.4, with 26% patients receiving ≥4 adsorbers. CS platforms included renal replacement therapy (68.8%), standalone hemoperfusion (10.7%) and ECMO (5.1%).

Baseline median APACHE II and SOFA scores were 24 [17-30] and 12 [9-14], respectively, with a median ICU length of stay of 20 [11-37] days. After CS, lactate and creatinine levels decreased significantly (P<0.0001), while albumin remained unchanged (P=0.12). Fluid

balance decreased from +1372 [163-3095] mL pre-treatment to +150 [-850 to 1500] mL post-treatment, while norepinephrine requirements dropped from 0.22 [0.09-0.39] to 0.09 [0.02-0.23] µg/kg*min (P<0.0001 for both). Median PaO_2/FiO_2 significantly increased from 132 [72-208] to 174 [105-254] (P<0.0001; Figure 1). Platelet counts were lower after CS therapy (from 127 [86-186] to 76 [44-125]*10^3/mL, P<0.0001), an effect that was primarily driven by the sepsis cohort.

Figure 1. Changes in norepinephrine, fluid balance and P/F ratio in 24 h periods before (grey) versus after CytoSorb® treatment (blue), data are presented as median and inter-quartile range

ICU mortality was 31.1% (in the septic shock cohort 33.3%), which was lower than APACHE II and SOFA-predicted rates. Among rhabdomyolysis patients (n=18), median myoglobin levels significantly dropped from 7517 [2053-31166] to 2032 [1252-7008] µg/L (P=0.004). In liver failure patients (n=23), bilirubin decreased from 12.1 [5.0-20.0] to 7.8 [5.2-12.2] mg/dL (P=0.053).

Conclusions-These real-world data with the use of CS as part of standard care in critically ill patients show significant improvements in key therapeutic objectives, including norepinephrine and fluid requirements, lactate levels and arterial oxygenation. Observed mortality rates were lower than predicted by risk scores.

THE EXPERIENCE OF THE TREATMENT OF THE EARLY AND LONG-TERM CONSEQUENCES AND COMPLICATIONS OF THE INJURIES OF THE MAIN VESSELS

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Introduction. The injuries of the main vessels remain relevant and sophisticated sphere of vascular surgery both, in therapeutic and organizational way. The purpose of the study is to analyse the character of the injuries, localization, concomitant trauma, results of treatment of the early and long-term consequences and complications and clinical outcomes in patients with injuries of the main vessels of the lower and upper extremities in the period from 2014 to 2024.

Materials and methods. There were analysed 900 cases of the injuries of the main vessels of the lower and upper extremities. The inclusion criteria were military servicemen of the Armed Forces of Ukraine; patients who required intervention on the main vessels; males. The exclusion criteria involved all civilians with vascular injury; females.

Results. During the actions in Ukraine was recorded 900 cases of the injuries of the main vessels. The damage of the artery was in 46.5%; in 11,1% - damage of the vein; in 42,4% - both. The analysis of the age category showed: 9.8%,- patients under 20 years old; 37,3%- from 21 to 30 years old; 29,4%- from 31 to 40 years old; 19,6%- from 41 to 50 years old; 3,9%- older than 50 years old. The localisation of the injuries was the following: 76,5% of the injuries were in femoropopliteal area, 21,6% - peroneal area, 1,9% - both. The injuries that accompanied the trauma of the main vessels included: bone injury (37,3%), bone and nerve injury (25,5%), nerve injury (23,5%), isolated soft tissue injury (13,7%).The injury of both lower or upper extremities occurred in 25,5%, organs of thoracic cavity in 3,9%, organs of abdominal cavity - in 3,9%, head and neck injury - in 2%, injury of 3 and more anatomical areas - in 17,6%, isolated trauma - in 47,1%. In 74,5% we identifiedsatisfactory result, in 17,3% - the treatment resulted in amputation of lower extremities, in 6,5% - thetreatment resulted in amputation of upper extremities, in 1,7% - lethal. The results of the long-term outcomes are presented in Figure 1.

Conclusion. Fortheeffective and adequate medical assistance to the injured combatants it is necessary to create thorough algorithm of specialized treatment of patients with described type of trauma in high-qualified medical institutions and rehabilitation centres which will be aimed at rescuefrom death from acute haemorrhage, prevention of severe disability and management of complications and clinical outcomes of the vascular trauma on all stages of medical evacuation.

USE OF BARE METAL STENT IN HEMIARCH REPAIR: A LESS INVASIVE APPROACH TO AORTIC DISSECTION DISEASE

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Objective: The use of Bare Metal Stent in combination with Hemiarch repair is less invasive than traditional total arch replacement. Studies show that it reduces hospital stay and postoperative complications while increasing therapeutic options in difficult cases of aortic dissection.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane, etc.

Results: Bare Metal Stent provides direct support to the aortic wall, reducing the risk of re-dissection or rupture. The metal graft promotes integration with the vascular wall without significantly disrupting the physiology of the aorta. The aortic arch is anatomically complex, with many branches, making precision in graft placement critical. For this, adequate blood flow to the branches of the aorta (carotid and subclavian arteries) must be ensured.

Conclusions: Compared to total aortic arch replacement, this technique is safer for frail patients with reduced tolerance to large-scale interventions. Studies show stabilization of the aortic structure and a reduced need for repeat interventions, and patients experience better blood flow and a reduced risk of recurrence of the dissection.

MICROCATHETER REMOVAL IN THE MIDDLE CEREBRAL ARTERY IN A NEONATE: SURGICAL APPROACH AND CHALLENGES

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Objective: to describe the extremely rare and high-risk procedure of microcatheter removal from the middle cerebral artery (MCA) in a newborn.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane, etc.

Results: The removal procedure requires specialized surgical technique and care due to the difficulties associated with the small size of the vessels and the sensitivity of the tissues. The surgical procedure begins with the preparation of the patient under general anesthesia and monitoring of the hemodynamic status. A longitudinal incision is made in the common carotid artery to exclude access to the catheter, followed by careful arteriotomy. The microcatheter is removed slowly and precisely, and vascular repair may require the use of a vascular patch or primary occlusion. Gradual reperfusion is then performed with monitoring for blood leakage or thrombus formation.

Conclusions: Microcatheter removal from the middle cerebral artery in neonates is an extremely risky procedure, which requires a special surgical approach to avoid rust, hemorrhage, and neurological complications. The success of the procedure depends on proper preparation and continuous monitoring of the patient during the postoperative period, with particular emphasis on antithrombotic therapy and Doppler blood flow assessment.

FRIDAY 16 MAY, 2025
e-poster area
12.00-13.00

CASE REPORT: THE CRITICAL ROLE OF ULTRASOUND IN DIAGNOSING TOTALLY INTRA-ARTERIAL MISPLACEMENT OF AN ANGIO-SEAL CLOSURE DEVICE

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Case Report: The Critical Role of Ultrasound in Diagnosing Totally Intra-Arterial Misplacement of an Angio-Seal Closure Device

Background: Vascular Closure Devices (VCDs) have transformed post-procedural hemostasis following arterial catheterization, providing a faster and more efficient alternative to manual compression. However, complications such as misplacement, arterial thrombosis, pseudoaneurysm, and occlusion require early diagnosis to prevent severe morbidity. While computed tomography angiography (CTA) and digital subtraction angiography (DSA) are commonly used, ultrasound (US) has emerged as a rapid, non-invasive, and highly effective diagnostic tool for vascular complications.

Case Presentation: A 59-year-old female presented with acute limb ischemia following coronary angiography via the right femoral artery, where vascular access was sealed using an Angio-Seal device. She experienced intermittent claudication, numbness, and weakened femoral pulses shortly after the procedure.

Ultrasound examination revealed a hyperechoic structure within the superficial femoral artery (SFA), identified as the misplaced Angio-Seal device with an intra-arterial anchor and collagen plug. Duplex imaging confirmed a complete thrombotic occlusion distal to the device. The patient underwent urgent thrombectomy and patch angioplasty, successfully restoring perfusion.

Discussion: This case highlights a rare but severe complication of total intra-arterial misplacement of a VCD, leading to acute limb ischemia. Ultrasound was pivotal in the early detection and diagnosis, enabling prompt surgical intervention.

The Angio-Seal device, a passive approximator, relies on an intra-arterial anchor, an extra-arterial collagen plug, and a connecting suture to achieve hemostasis. Misplacement of these components can lead to vascular injury. Studies have shown that deploying VCDs in the SFA instead of the common femoral artery (CFA) significantly increases the risk of complications, making site selection and real-time imaging critical.

This case underscores the indispensable role of ultrasound in:

- Detecting misplacement of VCD components

- Evaluating thrombotic complications in real-time

- Reducing dependence on invasive imaging like CTA or MRI

- Enhancing safety and precision during vascular interventions

Conclusion: Ultrasound should be integrated into routine vascular procedures to improve safety, reduce complications, and optimize clinical outcomes. This case demonstrates how early ultrasound diagnosis of intra-arterial VCD misplacement can lead to timely intervention and successful limb salvage. Future studies should further explore ultrasound's role in standardizing vascular closure techniques and minimizing procedural risks.

FAILURE OR SUCCESS? 7 ENDOVASCULAR INTERVENTIONS DURING 3 YEARS IN SEVERE CALCIFIED CASE OF CRITICAL LIMB ISCHEMIA

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Interventional Radiology

Background: Endovascular interventions are widely used combined or separately with surgery in treatment of critical limb ischemia (CLI). Calcinosis is one of the toughest challenges in such cases and often brings to poor short and long-term results.

Case report: Female 68 years old was admitted in January 2020 with CLI (Rutherford 5, Fontaine IV, WIfI 131, ABI 0.3) of left lower extremity due to multilevel severe calcified occlusions of superficial femoral artery (SFA), popliteal artery and below the knee (BTK) arteries (pic. 1). Open surgery was denied because of severe calcification. Endovascular recanalization of SFA and popliteal artery was performed with good angiographic and clinical results (pic. 2). After that 6 endovascular interventions were performed during 3 years due to recurrence of CLI. Different technologies were used including endovascular atherectomy, drug coating balloon angioplasty and etc.

Conclusions: Endovascular technologies development allows to achieve good short-term results even in severe calcified CLI cases. Long-term results remain uncertain and require further improvements.

SUBINTIMAL ANGIOPLASTY IN THE TREATMENT OF CHRONIC TOTAL OCCLUSIONS OF THE PERIPHERAL ARTERIES

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For long arterial occlusions containing hard plaque, regular transluminal angioplasty is often unsuccessful. The subintimal space at the beginning of the occlusion is entered with a wire loop, which is used to cross the occlusion with catheter support and re-enter the vessel lumen of the patent distal artery, creating a new blood flow channel. Bolia first described subintimal angioplasty and has outlined its main purposes for the treatment of chronic limb ischemia. The value of subintimal angioplasty in limb salvage, and even comparison to bypass grafting, suggests that subintimal angioplasty may be a good first-line approach to long-segment occlusions in CLI and higher Fontaine category patients who are at above average risk for surgery. 56 patients were treated with subintimal angioplasty. The patients were aged between 51 and 86 years (mean age 67 years). 42 of the patients were male and 14 were female. Arterial stenosis or occlusion was present in the common iliac arteries in 2 patients of 56 patients, the superficial femoral arteries in 43 patients (bilaterally in 19 patients), and the popliteal arteries in 13 patients (bilaterally in 5 patients). Fontaine grade III symptoms were present in 21 patients, and grade IIb symptoms were present in the other patients. CT angiography was performed on all patients before the procedure. Chronic total occlusion lengths were between 2 cm and 22 cm. Optimal patency was achieved in all patients except one. Nine patients required stent placement. An arterial rupture occurred in one patient and required surgical intervention. The patients were followed up at 1, 3, 6, 12, and 18 months. During the follow-up period, restenosis and occlusion was detected in 5 patients (one patient at the 11th month, 4 patients after the 12th month). Subintimal angioplasty can be used safely in total arterial occlusions. The complication rate is low.

RIGHT ATRIUM AMD PERICARDIUM PENETRATED BY END-STAGE-RENAL-DISEASE DIALYSIS PERMANENT TUNNELED CENTRAL VENOUS CATHETER

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Background/Aims: Placement of Central Venous Catheters (CVC) for End-Stage-Renal-Disease dialysis therapy involves central veins catheterization and when performed without ultrasound guidance and fluoroscopy can lead to disastrous sequelae. We present such a case where a patient is referred to our center to replace a CVC catheter that has been in place for ten days but was reportedly not working properly. As proven by this case, these patients should be methodically approached, and the failing catheters should not be removed before confirming their exact position by imaging.

Case report: A 73-year-old patient was referred to our hospital by her dialysis unit because the right jugular permanent CVC that was implanted by a different hospital 10 days ago was not working properly. Just before removing the catheter in order to replace it over the wire with a new one we noted its slight trajectory to the left mediastinum. In oder to confirm the position we performed an angiography. To our surprise, the distal port injection showed the right atrium and the proximal port injection depicted and inverted image of the heart's cavities - denoting the cavity of the pericardium (very rare image of pericardiography - video on presentation). We stopped the procedure without moving the catheter and after consultation with the cardiac surgery team the patient underwent an ECG gated cardiac Computed tomography that confirmed the position of the catheter in the right atrium through the pericardial cavity. The patient was then operated upon and the catheter removed by oversewing the defects and had an uneventful recovery. In this case, if the catheter was removed in the first place the patient would most likely develop life-threatening tamponade.

THE INTRODUCTION OF THE PRP-TECHNOLOGY TO IMPROVE THE LONG-TERM CONSEQUENCES AND OUTCOMES OF THE TREATMENT OF THE INJURIES OF THE MAIN VESSELS OF THE LOWER AND UPPER EXTREMITIES

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Introduction. In the structure of medical losses during the hostilities in modern conditions, the share of the injuries of the extremities is more than 70% of all injuries. During Russian attack on Ukraine we have increase different cases of gunshot wounds of the main vessels of the lower and upper extremities, combined injuries. The first and decisive role in the successful arterial reconstruction in difficult cases with arterial damage belongs to the rapid evacuation of the wounded to the specialized level of care. Despite the importance of specialized care, the prehospital phase often decides the fate of the wounded, because the reliability and adequacy of temporary cessation of bleeding from injury to delivery of the wounded to the operating room depends on the success of vascular surgery and saving lives.

The treatment of gunshot wounds of the main arteries is a complex multi-level process, which can be done only in the case of close cooperation of related surgical specialties. First of all they are traumatology, reconstructive and plastic surgery, anesthesiology and intensive care.

AIM: The aim of this study is to analyse the results of treatment and clinical outcomes in patients with injuries of the main vessels of the lower and upper extremities and implement of the PRP-technology to improve the long-term consequences and outcomes of the treatment of the injuries of the main vessels of the lower and upper extremities

METHODS: We have analysed 51 cases of gunshot wounds of the main vessels who have undergone treatment at our medical facility from 2014 to 2024. In 7% of these cases, we have used PRP-technology in the area of the proximal and distal anastomosis, the area of the vascular suture.

Results: During the environmental protection in eastern Ukraine was recorded 900 cases of the gunshot wounds of the main vessels. Analysing the results of treatment 74,5% there was identified satisfactory result and in 23,8% - the treatment resulted in amputation, 1,7% - mortality.

The injuries are a complex field of medicine, given the previously obtained results, it was important for us to improve the results and consequences, reduce the number of unsatisfactory results.

Platelet-rich plasma consists of two elements: plasma, or the liquid portion of blood, and platelets, a type of blood cell that plays an important role in healing throughout the body. Platelets are well-known for their clotting abilities, but they also contain growth factors that can trigger cell reproduction and stimulate tissue regeneration or healing in the treated area. Platelet-rich plasma is simply blood that contains more platelets than normal.

PHLEBOLYMPHEDEMA: A CASE SERIES ON DIAGNOSIS, MANAGEMENT, AND OUTCOMES

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Background: Phlebolymphedema is a chronic medical condition resulting from venous hypertension and lymphatic dysfunction. It manifests as progressive lower limb edema, dermatological changes, and ulceration. Despite its common occurrence, there is ongoing debate regarding optimal diagnostic and therapeutic approaches. This case series evaluates clinical presentation, diagnostic findings, and treatment outcomes in patients with Phlebolymphedema.

Methods: We analyzed 10 patients diagnosed with phlebolymphedema using clinical examination and duplex ultrasound. These patients received a conservative management protocol that included Intermittent Pneumatic Compression therapy (BÖSL Lympha-mat® 300N) every day for at least 10 consequent days at the first month which was repeated in the second month for 7 days and in 3rd month for 5 days, daily manual lymphatic drainage, daily Lymphatic bandage. None of the patients needed an intervention. If any skin laceration or/and ulcers, an appropriate wound dressing was applied in accordance with the related condition.

Results: Of the 10 patients, 90% had underlying great saphenous vein reflux. Following treatment, 100% reported symptom improvement, with a reduction in limb volume (mean decrease: 35%). Chronic ulcers in all patients healed successfully. Skin changes in all patients healed dramatically.

Conclusion: Phlebolymphedema is a complex but manageable condition. A multimodal approach combining venous interventions with lymphatic therapy improves outcomes. Further studies are needed to optimize treatment protocols.

KeyWords: Phlebolymphedema, chronic venous insufficiency, lymphedema, duplex ultrasound, compression therapy

A SURPRISING CAUSE OF ACUTE LIMB ISCHEMIA IN A YOUNG PATIENT WITH NO PREVIOUS MEDICAL HISTORY

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Background: Cystic adventitial disease [CAD] is a rare entity, representing 0.1% of all vascular pathologies. It affects the popliteal artery unilaterally, whether bilateral CAD has seldomly been described. We present a patient with acute limb ischemia (ALI) due to CAD, which escaped diagnosis at the time of initial revascularization and became evident during contralateral popliteal artery reconstruction at a later time.

Case report: A 47-year-old male patient with unremarkable previous history, presented to the Emergency Department of our hospital, with ALI and an immediately threatened left lower limb. On the right side ankle brachial index was 0.9. He underwent a computed tomography angiography (CTA) which revealed a pre-occlusive stenosis of the left superficial femoral artery [SFA] at its distal part and complete occlusion of the ipsilateral popliteal artery [POPA], the proximal anterior tibial artery and the tibioperoneal trunk**.** Additionally, a significant 70% focal stenosis was identified in the right POPA. However, the patient was asymptomatic in the right lower limb and this was not further investigated, at that time. He underwent an urgent open embolectomy, which was unsuccessful and subsequently, a SFA-posterior tibial artery bypass was constructed using a reversed, GSV graft. Noteworthy, and despite exhaustive laboratory testing profile, cardiac evaluation and control for neoplastic diseases, the patient was negative for any thrombogenic disorder and an obvious cause of ALI was not identified. Postoperatively, he underwent a MR angiography, to rule out rare causes of popliteal artery disease, such as popliteal entrapment or CAD, which were not confirmed. During the 6-month follow-up, the patient was subjected to a new CTA, which indicated a patent bypass while the above-mentioned lesion in the right POPA was retested. Considering the high-grade stenosis in the right POPA, and the previous acute and unexplained clinical presentation of the left lower limb ischemia, the patient underwent surgical exploration. Through a posterior approach the popliteal artery was dissected and the arteriotomy revealed a significant stenosis caused by a popliteal adventitial cyst filled with a gelly-like consistency. Excision of the affected arterial segment was performed followed by interposition grafting. Taking into account these findings, the initial event of left lower limb ALI was retrospectively attributed to acute arterial occlusion on grounds of unnoticed CAD. In conclusion, CAD is a pathology that should be suspected in young healthy patients with an otherwise unexplained event of ALI, even if imaging findings are inconclusive.

THE WORLD-FIRST 2-FENESTRATION & 1-SCALLOP LOW-PROFILE ENDOVASTEC MERIDIAN ENDOGRAFT TO TREAT A SACCULAR ANEURYSM OF THE SPLACHNIC AORTA IN A FEMALE PATIENT WITH NARROW ILIACS - A CUSTOM FENESTRATED SOLUTION BASED ON THE ALTURA PLATFORM

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Background: Current custom fenestrated endografts are hindered by the large bore delivery systems that need to traverse iliofermoral vessels in order to reach the proximal aorta. The novel low-profile Endovastec Meridian custom endograft is based on the Altura platform 14Fr delivery catheter that can provide a unique solution for cases with hostile access vessels.

Case Report: We report such a case of an 83-old English lady presenting with a symptomatic saccular aneurysm of her splachnic aorta and iliacs smaller that 6mm. Working closely with Lombard Endovastec R&D Department we designed the world-first 2-fenestration for the renals & 1-scallop for the superior mesenteric artery Meridian endograft and performed a wet lab test implantation in a 3d-model based on the patients anatomy. The implantation itself was uneventful and will be presented as an edited live case video. Final angiography showed no endoleaks with patent target vessels. The patient was discharged on day 7 and has completed her 12 month follow-up visit.

ENDOVASCULAR REPAIR OF RUPTURED ABDOMINAL AORTIC ANEURYSMS: SINGLE CENTRE EXPERIENCE FOCUSING ON 30-DAY MORTALITY AND MAJOR ADVERSE CARDIOVASCULAR EVENTS

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Background-Aim: Ruptured abdominal aortic aneurysm (RAAA) is a life-threatening condition with high mortality rates. Endovascular aortic repair (EVAR) has emerged as a minimally invasive alternative to open surgery. This retrospective study evaluates the outcomes of EVAR for RAAA at a single centre over a decade (2010-2020), focusing on 30-day mortality and early postoperative complications.

Methods: This retrospective study included patients who underwent EVAR for RAAA from January 2010 to December 2020. Data on demographics, comorbidities, hemodynamic status upon emergency room arrival, and the preoperative risk assessment using the Glasgow Aneurysm Score were recorded. All patients had a confirmed diagnosis by CT angiography. Procedural details, anesthesia type, technical success, and postoperative outcomes—including ICU admission, major complications, and 30-day mortality—were collected. Patients who died during resuscitation or those who required conversion to open surgery were excluded. Statistical analysis was performed using IBM SPSS Statistics, evaluating the association of age, sex, preoperative hemodynamic status, anesthesia type, pre and postoperative fibrinogen levels, and the use of resuscitative endovascular balloon occlusion of the aorta with early mortality.

Results: The study included patients aged 45-92 years (mean 74.2), with 91.25% being male. Hypertension (64.55%), coronary artery disease (43.03%), chronic obstructive pulmonary disease (41.77%), renal failure (32.91%), and stroke (6.32%) were the most common comorbidities. Upon emergency department arrival, 61.25% were hemodynamically stable, while 33.7% experienced loss of consciousness. EVAR under local anesthesia was successful in 67.5% of cases, and 17.5% were treated under general anesthesia, while 15% started with local anesthesia converted to general anesthesia. The technical success rate was 90% and 57.5% experienced complications. Major cardiovascular events occurred in 32.5%, including myocardial infarction (2.5%) and cardiac arrest (27.5%). The 30-day mortality rate was 27.5%, with cardiovascular complications, hemodynamic collapse, and multiple organ failure being the leading causes of death. Statistical analysis demonstrated a significant association between 30-day mortality and hemodynamic status, anesthesia type and pre-operative fibrinogen levels ($p < 0.05$). Hemodynamic stability and local anesthesia type were linked to improved survival rates.

Conclusions: The recorded mortality rate aligns with data from literature (18%-53%). EVAR demonstrated acceptable technical success and mortality rates in this patient cohort. The findings highlight key risk factors influencing survival, emphasizing the importance of hemodynamic stability and anesthesia selection in RAAA management.

OPEN REPAIR OF TYPE IIIA ENDOLEAKS IN ENDOLOGIX'S AFX AAA GRAFT SYSTEM IS NOT TECHNICALLY FEASIBLE: A LESSON LEARNED THE HARD WAY

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Background. Endologix's AFX Abdominal Aortic Aneurysm (AAA) Graft system first iteration detected an increased rate of Type III endoleaks of over 50% after 8 years of follow-up. The majority of these endoleaks were type IIIa (intercomponent/overlap), but there were also some type IIIb (fabric tear) leaks. In an attempt to address the safety concerns, the endograft has been replaced with the AFX2 System. However, some patients treated with the first iteration of the endograft have not been followed up, and there have been reports of severe complications. The most effective management of these type III endoleaks is endograft relining with another type of endograft or cuff.

Case report. We present the case of an 89 year-old male who was treated with the AFX AAA Graft system more than 15 years ago. He presented with type IIIa endoleak, AAA sac rupture, hemodynamic instability, and loss of consciousness. An appropriate endograft was not readily available to fix the leak. Hence, resuscitative endovascular balloon occlusion of the aorta (REBOA) was performed, the patient was stabilized, and an open repair was carried out with intention of suturing together the detached endograft components (Image 1). Unfortunately, this was not technically possible. The AFX polytetrafluoroethylene (PTFE) fabric quality was extremely poor, had suffered long-term degradation, reducing to a thin and friable film. Any suture bite would cause uncontrolled fabric tears (Image 2). In such cases, there is only one option for open surgery; endograft explantation and aortic graft reconstruction. It was a lesson learned the hard way as this octogenarian patient did not survive the operation.

HYBRID 2-STAGE REPAIR OF TYPE V THORACOABDOMINAL ANEURYSM AND INFRARENAL AORTIC OCCLUSION IN A FEMALE PATIENT

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Background: Thoracoabdominal aortic aneurysms (TAAA) are rarely associated with aortoiliac occlusion. When infrarenal aortic occlusion is present, it complicates repair by limiting options for visceral artery perfusion and spinal cord protection through distal aortic perfusion. This significantly increases the risk of postoperative complications and mortality. Here, we describe a two-stage hybrid repair of a Type V TAAA complicated by infrarenal aortic occlusion.

Case Report: A 58-year-old female with a history of dyslipidemia, hypertension, and smoking was referred for evaluation of stage IIb intermittent claudication. Upon examination, femoral pulses were absent, and the ankle-brachial index (ABI) was 0.5 on the right and 0.45 on the left. A computed tomography angiography (CTA) revealed a Type V TAAA with a maximum diameter of 61 mm, along with total occlusion of the infrarenal aorta with patent common, external and internal iliac arteries. The patient first underwent open surgical repair of the infrarenal aortic occlusion, including aortic endarterectomy and Dacron patch reconstruction. The postoperative recovery was uneventful, with no recurrence of claudication and restored pulses in both posterior tibial arteries. Two months later, the patient underwent endovascular repair of the TAAA using the Castor device proximally at the left subclavian artery and a custom fenestrated and branched endograft (F/BEVAR, COOK Medical) extending distally to land in the infrarenal aorta. The patient did not experience spinal cord ischemia, while a mild postoperative creatinine elevation resolved spontaneously. At 12 months of follow-up, CTA confirmed excellent vessel patency with no evidence of endoleak, and the patient remained in good clinical condition.

Conclusion: This case highlights the successful use of a two-stage hybrid repair for a Type V TAAA complicated by infrarenal aortic occlusion. The staged approach, which combined open surgical and endovascular techniques, minimized the risk of spinal cord ischemia and provided effective treatment of the aneurysm. This approach is a viable option for managing complex TAAA with aortoiliac occlusion, emphasizing the importance of careful preoperative planning and staged interventions.

IS SPINAL ANESTHESIA THE SAFE KEY FOR HIGH-RISK PATIENTS UNDERGOING VASCULAR SURGERY?

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BACKROUND AND AIM: Spinal anesthesia (SA) is a widely used regional anesthesia technique, offering effective pain control while avoiding the adverse effects of general anesthesia. However, its impact on cardiac function, particularly on left ventricular (LV) systolic and diastolic performance, remains unclear. Existing evidence is inconclusive, with studies reporting variable effects on LV ejection fraction (LVEF) and right ventricular (RV) function. Furthermore, vascular surgery patients present a high-risk subgroup with multiple coexisting pathologies, mainly cardiac, such as coronary artery disease and heart failure. This study aimed to evaluate the effects of SA on LV systolic performance, LV end-diastolic pressure (LVEDP), and RV function in euvolemic patients undergoing elective vascular surgery using transthoracic echocardiography (TTE).

METHODS: This prospective, single-center study included 62 adult patients undergoing elective vascular surgery with SA. Patients with contraindications for SA, significant valvular disease, or poor echocardiographic window were excluded. Euvolemia was maintained using targeted fluid administration guided by arterial waveform monitoring. TTE assessments were performed before and 20 minutes after SA to evaluate changes in LVEF, LVEDP (measured via the E/e' ratio and E/A ratio), and RV systolic function (via tricuspid annular plane systolic excursion, TAPSE and RV s'). Additionally, serum troponin and brain natriuretic peptide (BNP) levels were measured preoperatively and 24 hours postoperatively.

Results: LVEF significantly increased after SA (53.07% [16.51] vs. 53.86% [13.28], p<0.001), while end-diastolic (147.51±41.36 vs. 141.72±40.13 ml, p=0.044) and end-systolic volumes (69.50 [51.50] vs. 65.00 [29.50] ml, p<0.001) decreased. Stroke volume showed a non-significant increase (p=0.131). TAPSE and RV s' remained unchanged (p=0.558), indicating minimal impact on RV function. In patients with impaired systolic function, LVEF improvement was more pronounced (7.49±4.15 vs. 0.59±2.79, p<0.001), accompanied by significant reductions in end-systolic volume and in patients with elevated compared to those with normal LV end-diastolic pressures (LVEDP), an overall improvement in diastolic function was noted.

Conclusions: This study provides evidence that SA in euvolemic vascular surgery patients

improves LV systolic function and LVEDP while minimally affecting RV systolic performance. The observed benefits are more pronounced in patients with preexisting LV dysfunction,whether systolic or diastolic, suggesting a potential protective role of SA in this subgroup.

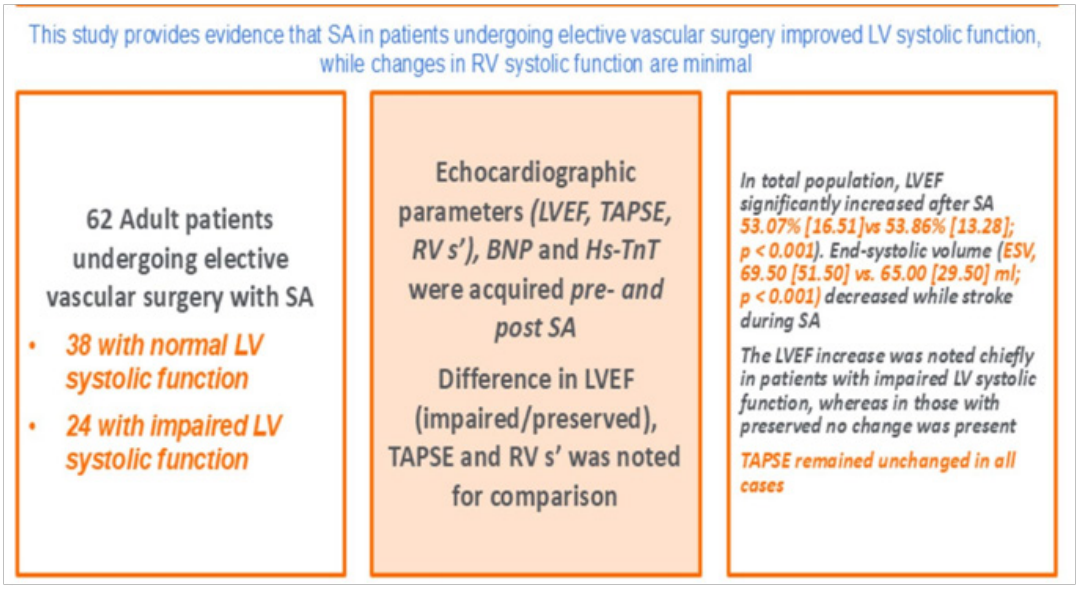

Image 1

PARAMETERS	Total population (n = 62)			E/e' ≤ 12 (n = 39)			E/e' > 12 (n = 23)		
	PRE	POST	*p*	PRE	POST	*p*	PRE	POST	*p*
EDV (ml)	147.51 ± 41.36	141.72 ± 40.13	**0.044**	145.86 ± 37.18	142.58 ± 31.17	0.491	150.31 ± 48.39	140.25 ± 52.77	**0.015**
ESV (ml)	69.50 [51.50]	65.00 [29.50]	**< 0.001**	69.00 [49.00]	65.00 [24.00]	**0.043**	70.00 [59.00]	60.00 [36.00]	**0.001**
E	75.00 [31.04]	67.27 [34.88]	**0.011**	69.80 [21.60]	64.23 [19.85]	0.055	89.33 [33.23]	84.65 [33.18]	0.064
A*	84.49 [20.74]	82.75 [26.62]	0.179	84.49 [24.72]	72.95 [19.17]	**0.001**	84.49 [18.03]	87.73 [30.88]	0.067
E/A*	0.87 [0.53]	0.92 [0.39]	0.109	0.81 [0.45]	0.86 [0.41]	0.701	1.20 [0.51]	1.00 [0.33]	**0.005**
e'	7.17 [2.53]	7.30 [2.38]	0.948	7.90 [2.45	7.33 [1.70]	**0.049**	6.10 [2.02]	7.00 [2.78]	**0.020**
E/e'	10.80 [4.21]	9.55 [3.91]	**0.019**	9.77 [3.60]	8.73 [2.31]	0.791	13.75 [2.77]	12.00 [4.56]	**0.001**

Image 2

FIRST IMPLANTATION OF A LARGE WINDOW FENESTRATION FEVAR DEVICE TO ACCOMMODATE THE COMMON ORIFICE OF THE SUPERIOR MESENTERIC AND CELIAC ARTERIES WITHOUT REQUIRING BRIDGING STENTS

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Background: Fenestrated endovascular aortic aneurysm repair (FEVAR) is currently the preferred treatment for juxtarenal abdominal aortic aneurysms to preserve blood flow to renal and visceral arteries. Fenestrations are preferred when the aortic wall is close to the endograft, and bridging stents are needed to be placed to seal the gap between the fenestration and the abdominal wall. However, these stents may be accompanied by complications.

Case report: An 81-year-old male patient visited the vascular surgery clinic at the University General Hospital of Heraklion for elective surgical treatment of a 6cm juxtarenal abdominal aortic aneurysm. This aneurysm had been diagnosed eight years prior, and the patient had been under regular follow-up throughout that time. Given his age and overall surgical risk, endovascular repair was chosen. The aortic neck measured < 5mm, and the distance between the common orifice of the superior mesenteric (SMA) and celiac arteries (CA) [anatomic variation] was noted to be just 3mm from the renal arteries. After considering all factors, it was decided to perform endovascular repair of the aneurysm, using a customized endograft with three fenestrations [FEVAR - Fens x2 in renal arteries with bridging stents & a large window without bridging stents for the common orifice of the SMA and CA]. The window is a large squared fenestration. To ensure the neck sealing and avoid a possible type IA endoleak, the graft was created with a second sealing stent at the level of the renal arteries. This is the first such endograft manufactured by Terumo marking its first implantation worldwide.

Both intraoperative and postoperative courses were uneventful. The patient was discharged from the hospital on the third postoperative day, achieving full mobilization and showing no signs of endoleak or other complications. The first month of surveillance included a computed tomography angiography, confirming a satisfactory position and deployment of the endografts, with no endoleaks or other complications.

The initial experience shows that in specific juxtarenal aortic aneurysm anatomies, the central seal can be moved centrally, but without the need to stent all visceral vessels, decreasing possible concomitant complications.

Fig. 1 The large window fenestration is outlined with 14 markers

Saturday 17, May 2025
e-poster area
09.00- 10.30

ID:21767 | ENDOVASCULAR REPAIR OF AN ABDOMINAL AORTIC ANEURYSM USING A REVERSED CHIMNEY GRAFT TECHNIQUE IN A PATIENT WITH A RIGHT PELVIC KIDNEY

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A pelvic kidney is the most common type of renal ectopia, a congenital anomaly characterized by abnormal location of one or both of the kidneys. This condition poses a significant challenge during abdominal aortic surgery, due to the variability of the vessels that supply the ectopic kidney. We present the case of an 87-year-old male with a 78mm abdominal aortic aneurysm and a right pelvic kidney, who was referred to our facility.
The right renal artery originated from the right common iliac artery, proximal to the origin of the right internal iliac artery. A synchronous penetrating ulcer of the right common iliac artery was identified, just proximal to the origin of the right renal artery. The aneurysm was treated with endovascular aortic repair (EVAR), and the reverse chimney graft technique was applied to preserve the right ectopic renal artery.
The patient experienced no complications during the immediate or late postoperative period.

RUPTURE AND INFECTION IN THE AORTIC ARCH: A LIFE-THREATENING INTERSECTION

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Background: Aortic arch pathologies, particularly in urgent scenarios such as rupture, present with high morbidity and mortality. While open surgery remains the gold standard, endovascular arch reconstruction offers a valuable alternative in specific cases, including urgent situations, high-risk patients, or those requiring reoperation. These cases become even more complex when infection is present, introducing multiple dilemmas and potential complications.

Case Report: This is the case of a 52-year-old man who presented to the emergency department with a contained rupture of an aortic arch Penetrating Aortic Ulcer measuring 65x73 mm, along with segmental pulmonary embolism, hemothorax, and left lung empyema. The patient's medical history included multiple comorbidities: chronic necrotic foot ulcer complicated by Salmonella enteritidis bacteremia two months prior, rheumatoid arthritis, and COPD. Given the patient's high-risk profile for open surgery, the hospital's multi-disciplinary aortic board opted for an endovascular approach.

The patient was treated with a custom-made (CMD), three-branched TEVAR (42-34-256), initially intended for another patient, including a pre-loaded catheter for the left carotid (LCCA) and left subclavian (LSA) arteries. The procedure was successfully performed via bi-femoral and right branchial percutaneous and left carotid cut-down access. A BeGraft+ 10x57 and Everflex 12x40 stent were implanted in the LSA through the femoral access. Then, the antegrade branch for the brachiocephalic trunk was catheterized via the right branchial artery and two CMD stents, thoracic extension (16-13-73), were implanted. Finally, the LCCA was surgically prepared and through this access a BeGraft+ 10x57 was implanted. Postoperative CTA showed adequate perfusion of all branches and no presence of endoleak.

However, post-operatively the patient presented with elevated infection markers despite negative blood cultures but positive stool cultures for Salmonella enteritidis. Additionally, left lung hemothorax was noted. A multi-disciplinary approach was initiated, including high-dose antibiotics, Bülau drainage for the hemothorax and bronchoscopy as well as gastroscopy to exclude aorto-esophageal and aorto-bronchial fistulas. The infection markers improved, and the patient was discharged with per os antibiotic treatment.
One month later, the patient was readmitted for wound healing issues, requiring multiple VAC changes and wound debridement. Despite high-dose antibiotics, infection markers remained elevated. A follow-up gastroscopy and bronchoscopy revealed a fistula between the aneurysm sac and the left bronchus, 1 cm distal to the carina. Following further multi-disciplinary discussions, it was determined that palliative care would be the most appropriate course of action for the patient.

MODIFIED BAVARIA TYPE II REPAIR OF COMPLEX AORTIC PATHOLOGY COMPLICATED BY REFRACTORY VASOPLEGIA, DISSEMINATED INTRAVASCULAR COAGULATION AND CAPILLARY LEAK SYNDROME

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Background: Hybrid aortic repair is increasingly reported. We present a case of modified Bavaria type II reconstruction to treat a complex aortic pathology.

Case Report: A 67 year old female presented with DeBakey type II dissection and chronic aneurysm of the aortic arch and the proximal descending thoracic aorta (figure 1). Cardiopulmonary bypass was instituted via 8 mm side grafts anastomosed to both axillary arteries and single venous cannula in the right atrium. After careful dissection of the arch vessels an ascending aorta clamp was placed and cardioplegic arrest of the heart was achieved. The dissected aorta was replaced with a synthetic Dacron 28 mm graft with an open distal anastomosis performed under deep hypothermic circulatory arrest and bilateral antegrade cerebral perfusion. A 10 mm graft was used for an aorto-innominate artery bypass. A 6 mm graft was used to bypass the left common carotid artery from the innominate artery bypass graft. Finally the 8 mm graft anastomosed to the left axillary artery was tunnelled underneath the pectoralis muscles, was brought into the field via the 2nd intercostal space and was anastomosed to the innominate artery bypass graft. After successful discontinuation of cardiopulmonary bypass retrograde deployment of three stent grafts via the right femoral artery allowed endovascular repair of the arch and descending aorta aneurysm in the reconstructed zone 0 (figure 2). Postoperatively the patient developed refractory vasoplegia, disseminated intravascular coagulation and capillary leak syndrome. She died 24 hours after surgery of multi-organ failure.

The case highlights the need for complex aortic repair in some patients. Vasoplegia after cardiac surgery, although relatively common, remains a cause of extremely high and early mortality in case of refractory to any treatment distributive shock. Moreover, this case describes the rare presentation of systemic capillary leak syndrome after cardiac surgery in an adult patient which, along with vasoplegia and disseminated intravascular coagulation, culminated in a rapidly evolving lethal outcome.

URGENT ENDOVASCULAR TREATMENT OF A SYMPTOMATIC 12CM THORACOABDOMINAL ANEURYSM WITH BIG THROMBUS BURDEN & PARTIALLY THROMBOSED RENAL ARTERY USING THE ARTIVION E-NSIDE ENDOGRAFT

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Background/Aims: Giant aneurysms with extensive thrombus burden can present with serious challenges due to both thrombus dislodgement during endovascular repair and to the chronic subclinical coagulopathy associated with persistent intravascular thrombus and coagulation factor activation. Impending rupture manifesting as continuous abdominal pain together with thoracoabdominal (TA) extend can make the clinical setting extremely tricky and dangerous for the patient's life. We present such a case treated endovascularly to stress technical and clinical problems encountered and their management.

Case report: A 73-year-old patient was transferred to our emergency department from another hospital due to abdominal pain and a pulsatile abdominal mass. Computed tomography angiography (CTA) showed a TA aneurysm (TAA) with the abdominal component being 12cm in diameter with a considerable thrombus burden and the renals demonstrating a low caliper. The patient was managed endovascularly with the E-nside endograft during the introduction of which the right renal artery was completely blocked by dislodged thrombus. Access to the vessel was eventually regained by a Fogarty-like maneuver from the brachial access (video demonstration) and the procedure was completed by target vessel bridging with long Viabahn endografts. Final Angiography showed patency of the target vessels without endoleaks while cone beam Computed tomography confirmed the structural efficacy of the repair. The patient recovered with acceptable renal function. He had a long but effective recovery due to limb muscle weakness and was ready to be transferred to a rehabilitation center. However, 40 days after the operation he developed a respiratory infection and was lost due to rapidly progressing uncontrolled sepsis.

HYBRID REPAIR OF TYPE B AORTIC DISSECTION WITH LEFT SUBCLAVIAN ARTERY REVASCULARIZATION: A CASE OF CAROTID-SUBCLAVIAN BYPASS FOR SHORT ANEURYSM NECK MANAGEMENT

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Background: Acute Type B aortic dissection (TBAD) is a life-threatening condition that often requires thoracic endovascular aortic repair (TEVAR). In cases where the proximal landing zone is compromised by a short aneurysm neck, intentional coverage of the left subclavian artery (LSA) may be necessary. However, LSA coverage can lead to complications such as upper limb ischemia, posterior circulation stroke, and spinal cord ischemia. Therefore, LSA revascularization should be considered in patients with a dominant left vertebral artery, prior coronary or cerebral bypass grafts originating from the LSA, or inadequate collateral circulation.

Case Report: A 70-year-old male with a history of hypertension, coronary artery disease, and hypercholesterolemia presented with acute chest and back pain following uncontrolled blood pressure. CT angiography revealed an acute TBAD with aneurysmal degeneration and a short proximal neck. TEVAR was performed with intentional coverage of the LSA to secure an adequate proximal landing zone. To prevent ischemic complications, a carotid-subclavian bypass was performed prior to TEVAR deployment. The patient had an uneventful recovery, with preserved left upper limb perfusion and no neurological deficits. Follow-up imaging confirmed successful aortic remodeling without endoleak or graft migration.

This case highlights the importance of individualized treatment planning in TBAD, emphasizing the role of LSA revascularization when coverage is necessary for optimizing TEVAR outcomes

THE OCCULT AORTIC SAC ENLARGEMENT AFTER ENDOVASCULAR AORTIC ANEURYSM REPAIR

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Background: Despite being the golden-standard method for treating anatomically suitable abdominal aortic aneurysms, endovascular aortic aneurysm repair (EVAR) has some complications with endotension being one of the most challenging and least understood. Defined as aortic sac enlargement without radiologically detectable endoleaks, endotension is rare (1%-5%) but carries a significant risk of aneurysm rupture. To this day, its exact mechanism remains unclear, with proposed explanations including microleaks undetectable by existing imaging modalities, pressure transmission through thrombus or graft fabric, ultrafiltration and hyperfibrinolysis. Anticoagulation and infection have also been suggested as contributing factors. No established guidelines or consensus, and the lack of clear etiology make both diagnosis and management exceptionally difficult. Here, we present a case of a post-EVAR patient with continuous aortic sac growth despite no visible endoleaks on imaging, highlighting the clinical challenges posed by this enigmatic and sometimes fatal complication.

Case report: A 69-year-old male underwent an elective non-complex EVAR for an asymptomatic infrarenal aortic aneurysm with a preoperative maximum diameter of 83 mm. The patient was known to have type 2 diabetes, arterial hypertension and a history of myocardial infarction. The EVAR procedure was performed successfully, without any intra- or early post-operative complications. Three months after the procedure, a 6 mm enlargement of the aortic sac was detected on CTA, however, no endoleak was identified and there weren't any inflammatory changes around the aneurysm sac. A second follow-up CTA, performed nearly 2 years later, showed an additional 4 mm increase in sac size, again without any visible endoleak or signs of infection. Given the 10 mm total enlargement and the associated increased risk of rupture, the patient was hospitalized for reintervention. Due to the unclear cause of continuous aortic sac enlargement, it was decided to perform an open surgery with aortic stent-graft explantation and open aortic aneurysm repair using a bifurcated graft. After cutting open the aneurysm sac, no fresh blood, blood clots or patent lumbar arteries were found, which confirmed the occult sac enlargement. Aortic stent-graft's main body was explanted leaving only the proximal ring of it, iliac branches were also explanted leaving only the distal sealing zones attached to vessel walls. Proper fixation of remaining stent-gratf parts was performed and the bifurcated graft was sutured in an end-to-end fashion. Surgery went uneventfully, patient spent 1 day at the Intensive Care Unit and then was transferred to Vascular Surgery Unit for futher surveillance.

HISTOLOGICAL EVALUATION OF DIFFERENT RADIAL ARTERY HARVESTING TECHNIQUES: ENDOSCOPIC VS. CONVENTIONAL METHOD

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This study presents the results of comparing two surgical techniques (endoscopic and classical) of radial artery preparation in patients with surgical myocardial revascularization

SHORT-TERM OUTCOMES OF VALVE-SPARING AORTIC ROOT REIMPLANTATION VERSUS AORTIC ROOT REPLACEMENT IN BICUSPID AORTIC VALVE PATIENTS WITH AORTIC ROOT ANEURYSM: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Bicuspid aortic valve (BAV), the most common congenital valvular anomaly, is often associated with aortic root aneurysms, requiring surgical intervention. The Bentall procedure has been the standard approach, but the valve-sparing David procedure is increasingly favoured for preserving the native valve. Despite its growing use, comparative data on its outcomes versus the Bentall procedure in patients with BAV and aortic root aneurysm remain scarce. This is the first meta-analysis to provide a focused comparison of these two techniques in this specific patient population.

Methods: A comprehensive literature search was conducted in PubMed, Scopus, and Cochrane Library for studies comparing David and Bentall in patients with BAV and aortic root aneurysm. Pooled odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI) were calculated using RevMan 8.11.0.

Results: Our meta-analysis included four observational studies encompassing 679 patients, with 252 (37.1%) cases conducted via the David procedure. The David procedure was associated with significantly longer cardiopulmonary bypass [MD 42.2 minutes; 95% CI 16.7 to 67.6; $p<0.05$] and cross-clamp times [MD 50.8 minutes; 95% CI 22.8 to 78.8; $p<0.05$]. Nevertheless, it demonstrated reduced hospital length of stay [MD -1.4 days; 95% CI -2.7 to -0.1; $p<0.05$] and fewer re-explorations for bleeding [OR 0.4, 95% CI 0.1 to 1.0; $p<0.05$]. Other postoperative outcomes, including stroke, arrhythmias, 30-day mortality, and ICU length of stay, were comparable between the two approaches.

Conclusion: Our findings suggest that the David procedure is a viable and safe alternative to the Bentall procedure for patients with BAV and aortic root aneurysm. Despite longer CPB and cross-clamp times, the David procedure offers significant perioperative benefits, including reduced hospital stay and fewer re-explorations for bleeding, without compromising key clinical outcomes.

PAST, PRESENT, AND FUTURE - MILESTONES IN THE INNOVATION DEVELOPMENT PROCESS FOR A NOVEL MITRAL ANNULOPLASTY RING SIZING DEVICE AND METHOD

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Background-Aim: The objective of this presentation is to provide an update on the ongoing surgical device innovation development process with reporting of current data and plan for next steps in animal and human testing. A novel "paired-ring" mitral annuloplasty ring sizing device/technique (Figure) was introduced at *AATS Mitral Conclave 2023* as proof-of-concept, and early data were presented at *ESCVS 2024*. This new method offers the potential for a paradigm shift in how mitral annuloplasty sizing is conducted. The device has been approved for first-in-human trial at our institution. This technique has the potential to dramatically improve ring selection during valve repair procedures by allowing the surgeon to evaluate repair results - including the ability to preview and predict coaptation length - *prior* to ring implantation. The sizing platform can easily be designed to support any commercially available annuloplasty ring/band (across all sizes).

Methods: Key milestones are highlighted reporting relevant data to date. Included are process descriptions regarding concept formulation, early prototyping and manufacturing design, engineering adaptation to commercially available products, development of validation methods and procurement of validation data.

Results: Data are presented in support of each portion of the development process outlined above. Included are Bland-Altman analyses demonstrating no evidence of heteroscedasticity (>1,000 data points) in the design specifications when applied to a commercially available ring, video documentation of the validation method in a swine cadaveric heart model is provided, measured "predicted" changes in coaptation length (swine model) achieved consistent results with all measurements within 0.0-0.5mm margin of error.

Conclusion: Relevant validation and accelerated progress across multiple milestones of the development process have been achieved. Novel valve sizing device and method show promise as preparations are made to enter first-in-human trial.

ARTERIOVENOUS DYSPLASIA OF GALEN: DIAGNOSIS, TREATMENT AND PROGNOSIS

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Objective: The aim is to highlight arteriovenous malformation of Galen (VOGM), a rare congenital vascular anomaly of the brain, and to present the clinical features, diagnostic methods, therapeutic approaches and prognosis of the disease. It focuses on the need for early diagnosis and treatment to improve survival and minimize neurological complications.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane etc.

Results: Arteriovenous malformation of Galen causes clinical symptoms that vary depending on the age of the patient. In the neonatal period, heart failure due to high blood supply and cerebral congestion with hydrocephalus may occur. In childhood, developmental delay, seizures and other neurological disorders are the main symptoms. Treatment includes embolization as the first line of intervention to block the pathological vascular connections. Surgery is rarely performed due to the high risk, while drug support is used to manage heart failure.

Conclusions: Early diagnosis and timely treatment of arteriovenous malformation of Galen are critical to improve survival and reduce neurological complications. Despite modern therapeutic approaches, severe cases remain difficult and the prognosis remains poor in some individuals.

VASCULAR RINGS: CLINICO-MORPHOLOGICAL TYPES AND TREATEMENT STRATEGIES

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Background: Vascular rings are a group of congenital anomalies characterized by abnormal formation of vessels involving the trachea and esophagus. Clinical manifestations vary from asymptomatic to respiratory and gastrointestinal symptoms.

Materials and methods: Analysis of patients operated with vascular rings in the Cardiovascular Surgery Clinic of the Republican Hospital "T. Mo?neaga" during the years 2019-2024.

Results: In total, 14 patients with vascular rings were examined, with age between 2 days of life to 66 years old. Double aortic arch was diagnosed in 4 patients, right-sided aortic arch with an abnormal left subclavian artery and Kommerell's diverticul in 9 patients, and coarctation of the aorta with a left-sided arch and an abnormal right subclavian artery in 1 patient. Surgeries were performed in 10 patients. A newborn child died from bronchopulmonary fistulas due to oesophageal atresia. Repeated interventions were performed in two patients due to insufficiently radical primary surgery. Three patients underwent concomitant operations simultaneously with resection of the abnormal vessels: ventricular septal defect plastic surgery, modified B-T shunt in tetralogy of Fallot, and resection of aortic coarctation. No fatal cases were observed in the operated patients. Three patients, one of whom is 66 years old, are under observation due to the absence of an obvious clinical picture.

Conclusions: The wide spectrum of clinical presentation represents real challenges in establishing the diagnosis, a fact that has been eased by more thorough investigations of children with feeding and swallowing disorders, as well as those with respiratory symptoms. Short-term results after surgery are favorable, resulting in the disappearance of symptoms and improvement in quality of life.

SURGICAL TREATMENT OF COMPLEX CONGENITAL CARDIAC MALFORMATIONS WITH PULMONARY ARTERIAL OVERLOAD - SHORT TERM RESULTS

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Aim: Complex congenital heart malformations (CHM) with intracardiac shunting are associated with severe pulmonary hypertension (PHT). In the absence of surgical treatment, they can quickly lead to Eisenmenger Syndrome. The purpose of the study is to analyze the experience of surgical treatment of complex Congenital Heart Malformations (CHM).

Materials and methods: Within 5 year period 51 children with complex CHM and 92 with ventricular septal defects benefited from surgical treatment in the Congenital Heart Surgery Department of the Republican Clinical Hospital "Timofei Mo?neaga". In-hospital exam included clinical evaluation, chest X-ray and selective cardiac catheterization. The group of pathologies selected for the study were: Complete atrioventricular canal (CAVC) - 30 patients (58.8%), Double outlet right ventricle (DORV) - 11 (21.5%), Single ventricle (SV) - 8 (15%) and Transposition of great arteries with ventricle septal defect (TGA + VSD) - 2 (3.9%) and 93 children with VSD. The surgical treatment of complex CHM included radical correction or staged correction, the first operation being palliative (Pulmonary Artery banding) and the second - the radical correction. 25 (49%) patients underwent staged surgical treatment and 26 (51%) started with radical correction. All children had average right ventricle systolic pressure 54,5± 3,6mmHg before surgery.

Results: After-surgery complications in the group with CHM pneumonia evolved in 27 cases (52.9%), pleural effusion - in 7 cases (13.7%), third-degree AV block - in 2 cases. In the VSD group pneumonia evolved in 7 cases (18.2%), pleural effusion - in 8 cases (8.6%), third-degree AV block - in 1 case. In the group with complex CHM, children under 6 kg and average age of 4,1 months, mortality was 9.8%, while in the group of VSD it was 4,3%. In the group with pulmonary artery banding mortality was 5.8%.

Conclusions: After-surgery results in complex CHM depend on the patient's age, weight, hemodynamic disorders, pulmonary artery hypertension degree and the general clinical background.

Pulmonary artery banding is a relatively high-risk method but is an important step in the management of patients with progressive heart failure, hypotrophy and associated anomalies.

CURRENT ROLE OF CROSSOVER BYPASS IN THE TREATMENT OF CHRONIC LIMB-THREATENING ISCHEMIA

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Background. Crossover bypass is an extraanatomical revascularization method used in high-risk patients with unilateral extensive iliac artery disease. The **aim** of this study was to assess the current indications, technical details and early outcomes of iliofemoral and femorofemoral crossover bypasses in patients with chronic limb-threatening ischemia (CLTI). **Methods.** Data of 50 consecutive patients with CLTI, operated between January 2019 and March 2024 at a single centre were collected and analysed prospectively. Patients were followed for at least 12 months postoperatively. **Results.** Median patients age was 70 (IQR 63-72) years, 44 (88%) were male. CLTI Fontaine stage IV was diagnosed in 23 (46%) cases. Preoperatively, mean ankle-brachial index (ABI) value was 0.2 (95%CI 0.14-0.26) and mean pedal acceleration time was 254 (95%CI 236-272) ms. Contralateral iliac artery served as an inflow in 24 (48%), femoral artery - in 21 and patent synthetic graft (aorto-femoral / axillo-femoral) - in 5 cases. In 21 (42%) cases distal anastomosis was constructed with deep femoral artery. Endovascular treatment of the donor iliac axis was performed in 9 (18%) cases and 14 (28%) patients required endarterectomy of the recipient artery. PTFE graft was used in 41 (82%) patients (6 mm - in 20 cases, externally supported - in 15 cases) and great saphenous vein - in 9 patients. One patient died after surgery due to cardiac complications, early bypass occlusion was registered in 2 (4%) cases, and 2 (4%) patients developed minor wound complications. Postoperatively, mean ABI value was 0.66 (95%CI 0.61-0.72) and mean pedal acceleration time was 148 (95%CI 124-171) ms. Primary patency was 89% at 1 year and amputation free survival was 93%.

Conclusions. Iliofemoral and femorofemoral crossover bypasses remain acceptable option for revascularization in CLTI patients with extensive occlusive disease, severe comorbidities or filed endovascular treatment.

POSTOPERATIVE RESULTS IN ADULT PATIENTS WITH CONGENITAL HEART DEFECTS AND INTRACARDIAC SHUNTING

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Aim: Assessment of postoperative functional status in adult patients with congenital heart defects and intracardiac shunting, elucidation of causes and frequency of specific complications after cardiac surgery

Matherials and methods: The paper presents the study of a group of 571 patients aged between 19 and 70 years, of which 388 (67.9%) patients were women and 183 (32.1%) were men with congenital heart defects and pulmonary hypervolemia, operated on between 1988 and 2024. The most representative group is made up of patients with atrial septal defect 379 (67.5%). Cardiopulmonary bypass was performed in conditions of superficial hypothermia, myocardial protection - by terpid blood cardioplegia.

Results: Pulmonary complications were specific for patients with pulmonary hypertension. Postoperative pneumonia was present in 32.9% and pleurisy in 27.1% of cases. Postoperative NYHA functional class II was recorded in 390 (68.3%) patients and NYHA functional class I in 138 (27%) patients. 7(9%) remained in functional class IV NYHA and the rest being in functional class III NYHA. Mortality was 1.13% (8 patients).

Conclusions: Surgical treatment of congenital heart defects with intracardiac shunting is preferable before HTP's beginning. Indications for operations do not depend on the patient's age and hemodynamic disturbances but it depends on pulmonary obstruction degree. Upgraded surgical techniques and intraoperative myocardial protection technique have reduced postoperative complications and mortality.

PORT IMPLANTATION TIVAP IN THE SUPRACLAVICULAR VARIANT OF THE CEPHALIC VEIN: FIRST DOCUMENTED CASE OF TIVAP IMPLANTATION

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Background: Totally implantable venous access ports (TIVAPs) are essential for long-term intravenous therapies, particularly in oncology patients. The cephalic vein (CV) is frequently used for catheter insertion due to its accessibility. However, anatomical variations can pose technical challenges during port implantation. One rare but clinically significant variant is the supraclavicular cephalic vein draining into the external jugular vein (EJV), which has not been previously described in the context of TIVAP placement.

Case Presentation: We present the first documented case of TIVAP implantation in a patient with a supraclavicular cephalic vein variant terminating into the external jugular vein. A 52-year-old female with left-sided breast cancer underwent TIVAP placement for chemotherapy. During the procedure, the cephalic vein was found in an atypical supraclavicular position, connecting to the EJV instead of the axillary vein.

Initial catheter insertion was unsuccessful due to a high-grade stenosis at the CV-EJV junction. A percutaneous transluminal angioplasty (PTA) with a 3 × 80 mm balloon was performed to facilitate catheter advancement. Postoperative imaging confirmed optimal catheter positioning in the superior vena cava, and the patient tolerated the procedure without complications.

Discussion: While variations in the cephalic vein anatomy occur in 2-4% of the population, this is the first reported case where a TIVAP was successfully implanted in a supraclavicular cephalic vein variant terminating into the external jugular vein. Anatomical anomalies like this can increase the risk of catheter malposition, thrombosis, and procedural failure. Therefore, preoperative imaging (e.g., ultrasound, venography) is crucial for identifying such variations and preventing technical difficulties.

Conclusion: This case highlights the importance of anatomical awareness during TIVAP placement and demonstrates that percutaneous transluminal angioplasty can be an effective strategy for overcoming anatomical challenges. Given the rarity of this variant, further research is needed to assess long-term outcomes in similar cases.

MANAGEMENT AND PROGNOSIS OF CARDIAC TUMORS: PAPILLARY FIBROELASTOMAS AND CARDIAC MYXOMAS

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Objective: To examine the nature, characteristics and complications of papillary fibroelastomas and cardiac myxomas, which are the most common primary cardiac tumors in adults. At the same time, the challenges faced by vascular surgeons in locating and removing these tumors, as well as the importance of early diagnosis and surgical intervention, will be highlighted.

Material- Methods: All data were obtained from medical databases such as Pub med, Scopus, Cochrane, etc.

Results: Papillary fibroelastomas and cardiac myxomas are benign, but can cause serious complications, such as embolic events, arrhythmias and murmurs. Cardiac surgeons face challenges in locating the tumors, especially when they are located in difficult locations, such as heart valves. The operation requires careful resection of the tumor, aiming for complete removal to avoid recurrence and preserve cardiac function. Cardiopulmonary bypass is used to safely resect and, if necessary, restore cardiac structures.

Conclusions: Early diagnosis and appropriate surgical treatment of papillary fibroelastomas and cardiac myxomas are crucial to avoid complications and improve the quality of life of patients.