SUPPLEMENT

# ABSTRACTS OF THE SPCCTV 4D VISIONS 2025

CONGRESSO SPCCTV 4D VISIONS 25

CARDIAC SURGERY

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# WOMEN'S REPRESENTATION IN OBSERVATIONAL STUDIES VERSUS RANDOMIZED CLINICAL TRIALS IN CORONARY ARTERY BYPASS GRAFTING SURGERY: AN UMBRELLA REVIEW

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***Keywords:*** *Coronary Artery Bypass Grafting Surgery, Women, Umbrella Review*

**BACKGROUND:** The underrepresentation of women in real-world settings of interventional cardiovascular research has been identified as a problem of underdiagnosis and undertreatment. In the field of coronary artery bypass graft Surgery (CABG) this phenomenon might have a significant impact in important treatment decisions, including surgical strategy and conduit choice. Moreover, recruiting women for randomized clinical trials (RCTs) is challenging due to coexisting morbidities and restrictive inclusion/exclusion criteria. **AIM:** To systematically evaluate the prevalence of women in OBS studies versus their participation in RCTs comparing multiple with single arterial grafting. **METHODS:** An umbrella review compiling data from meta-analyses using Medline, Cochrane and Web of Science Databases. The included meta-analyses were designed to compare multiple arterial grafting (MAG) with single arterial grafting (SAG). The number of women per study type was collected from each meta-analysis. Women-to-men ratio was estimated for OBS and RCTs and the difference and standard error of the difference between ratios were estimated. **RESULTS:** Twenty-three meta-analyses published between 2018 and 2023 were included in this review. From a total of 400 studies, 248 were duplicates, 1 had small sample size, 1 was an RCT post-hoc analysis, 2 focused exclusively on women and 6 were overlap studies and therefore excluded. A total of 142 reports (14 RCTs), published between 1994 and 2023, were included in this review. A total of 3 734 719 patients (3 727 948 from OBS and 6 771 from RCTs) were included. The global proportion of women was 25.2% in OBS and 19.3% in RCTs, corresponding to an women-to-men ratio of 0.337 (95%CI: 0.336-0.338) in OBS and 0.239 (95%CI: 0.225-0.254) in RCTs. **CONCLUSION:** These findings reveal a significant underrepresentation of women in CABG studies, with particularly low recruitment in RCTs vs OBS, reflecting a substantial gender disparity. While the low women-to-men ratio in the OBS studies could be attributed to women's underdiagnosis and undertreatment, this imbalance underscores the challenges in enrolling women in RCTs and might compromise generalizability of current study findings. We speculate that this phenomenon might be, at least partially, explained by the fact that women often present later and with more comorbidities. We therefore believe that strategies to improve women's enrolment should be implemented, including less restrictive criteria.

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# TRANSESOPHAGEAL ECHOCARDIOGRAPHY IN THE DETECTION OF VENOUS BAFFLE OBSTRUCTION AFTER SENNING SURGERY, IN D-TGV

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***Keywords:*** *Senning Surgery, Transesophageal Echocardiography, Venous Baffle Obstruction*

**BACKGROUND:** Dextra-transposition of the great vessels (D-TGV) is one of the most challenging congenital pathologies. In the event of a late diagnosis, one surgical option is to perform Senning surgery, and despite surgical innovations, this procedure is associated with several complications. Of the cases requiring surgical reintervention, 9 to 30% are due to obstruction of the systemic or pulmonary venous baffle. Echocardiographic evaluation is essential for a complete understanding of the physiology and morphology of this pathology and other concomitant structural changes. Transesophageal echocardiography (TEE) can be a useful tool for the early diagnosis of critical complications, even during the intraoperative period. **OBJECTIVES/ METHODS:** This study consists of a literature review on echocardiographic criteria for the diagnosis of venous baffle obstruction using intraoperative TEE after Senning surgery. **RESULTS:** A search was conducted in PubMed using the terms "(senning surgery) AND (echocardiogram)", which yielded 135 articles. After applying a 10-year filter, we obtained 29 articles for this review; however, only five articles refer to echocardiographic criteria. These authors present different echocardiographic criteria for pulmonary venous baffle obstruction, such as an anteroposterior diameter less than 6 mm or less than 15 to 20 mm/m$^2$ and a mean gradient greater than 3 mmHg, a maximum velocity greater than 2 m/s, or a maximum gradient greater than 33 mmHg. Regarding systemic venous baffle obstruction, they indicated an anteroposterior diameter of less than 10 mm and a mean gradient greater than 6 mmHg or a maximum velocity greater than 1.2 m/s or loss of phasic flow in the presence of a mean gradient greater than 2 mmHg. **CONCLUSIONS:** Although there is no agreement on the echocardiographic criteria for the diagnosis of obstruction, TEE plays an essential role in intraoperative cardiac surgery because it allows immediate detection of the location and severity of the obstruction, which may occur at multiple levels. These findings support and guide the need for surgical correction of the surgical procedure used, even during the intraoperative period. The use of intraoperative TEE contributes significantly to the best possible surgical outcome, leading to a reduction in the number of complications and reoperations.

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# MECHANICAL VERSUS BIOPROSTHETIC AORTIC VALVE REPLACEMENT IN PATIENTS AGED 55–70 YEARS OLD – A COMPARATIVE OUTCOME SINGLE CENTER ANALYSIS

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***Keywords:*** *Aortic Valve Replacement, Bioprosthesis, Mechanical Prosthesis*

**INTRODUCTION:** Aortic valve replacement (AVR) remains the gold standard treatment of severe aortic valve disease. While European and American guidelines clearly recommend which valve, biological or mechanical, to implant in very young or elderly patients, a 'grey zone' exists in the 50-65 age range, where recommendations are less straightforward and more individualized. Studies have extended this debate up to 70 years of age. Methods: This single-center retrospective study included 1653 patients aged 55-70 who underwent isolated surgical AVR between 2000 and 2019. The primary objective was to compare long-term survival between mechanical and biological prostheses. After descriptive and comparative analysis, Propensity Score Matching was applied, yielding a balanced cohort of 800 patients. Survival outcomes were assessed through Kaplan-Meier estimates and Cox proportional hazards models at 5, 10, 15, and 20 years. An elastic net regularized Cox model identified key mortality predictors. Results: In the matched cohort, overall survival did not differ between mechanical and bioprosthetic valves at 5 years (log-rank $p = 0.27$) or at 10, 15 and 20 years (all pooled log-rank $p > 0.39$). Cox models confirmed the absence of a significant hazard difference (20-year HR = 0.88, 95 % CI 0.61-1.28). Age-stratified curves (55-60, 60-65, 65-70 years) likewise showed no valve-related survival advantage. Multivariable analysis identified pre-operative creatinine clearance (>35 ml/min) as a consistent protector (HR $\approx$ 0.75), while advanced age, insulin-dependent diabetes conferred higher risk, with obesity having a paradoxal time-dependent effect. The type of prosthesis never emerged as an independent predictor of mortality. Conclusion: Long-term survival in patients aged 55-70 years is governed by patient comorbidity rather than valve material. Our data support current guideline equipoise within this age band and emphasise an individualised, comorbidity-guided approach especially relevant in the valve-in-valve transcathether valve implantation era, where the finite durability of bioprostheses can be mitigated by minimally invasive re-intervention.

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# CEREBRAL PROTECTION IN AORTIC ARCH SURGERY

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***Keywords:*** *Doppler Transcraneano, Proteção Cerebral, Cirurgia do Arco Aórtico*

**INTRODUCTION:** Aortic arch surgery is a technically demanding procedure associated with a substantial risk of neurological complications, which significantly contribute to perioperative mortality and prolonged hospitalization. The reported incidence of postoperative neurological deficits ranges from 4.7% to 10.3%. Given this risk profile, continuous and reliable intraoperative cerebral monitoring is critical to maintaining adequate cerebral perfusion and enabling the early detection of ischemic or embolic events. Transcranial Doppler (TCD) has emerged as a valuable noninvasive modality for real-time assessment of cerebral blood flow and microembolic load. This study aims to critically review the principal strategies for cerebral protection in aortic arch surgery. Techniques addressed include hypothermia, antegrade and retrograde cerebral perfusion, as well as neuromonitoring modalities such as TCD, Near-Infrared Spectroscopy (NIRS), electroencephalography (EEG), and the Bispectral Index (BIS). TCD allows continuous evaluation of cerebral hemodynamics, facilitating the optimization of antegrade perfusion and supporting intraoperative decision-making, including conversion from unilateral to bilateral cerebral perfusion in the setting of inadequate flow. Adjustments in extracorporeal circulation parameters, guided by TCD data, can further enhance cerebral perfusion. Moreover, TCD provides sensitive detection of microemboli, which are associated with increased postoperative morbidity. Early identification of these events permits timely intraoperative interventions aimed at mitigating cerebral injury. When combined with complementary modalities such as NIRS, EEG, and BIS within a multimodal monitoring framework, TCD contributes to improved neurological outcomes. Aortic arch surgery therefore necessitates rigorous cerebral protection strategies supported by advanced monitoring due to its high neurological risk. TCD represents an indispensable tool, offering dynamic and continuous information on cerebral perfusion and embolic burden. Its integration into multimodal neuromonitoring protocols has the potential to improve neurological prognosis substantially. Ultimately, individualized perfusion strategies, guided by TCD and other advanced monitoring technologies, are essential to reducing neurological morbidity in complex aortic arch procedures.

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# EXPERIENCE WITH TRANSCATHETER MITRAL VALVE REPLACEMENT USING THE TENDYNE SYSTEM: THE ČESKÉ BUDĚJOVICE COHORT

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***Keywords:*** *Tendyne, Mitral Valve*

**INTRODUCTION:** Transcatheter mitral valve replacement (TMVR) using the Tendyne system is a minimally invasive technique that does not require cardiopulmonary bypass. It represents a promising alternative to conventional surgical valve replacement in carefully selected high-risk patients. This study presents our center's experience with the Tendyne system. Methods Through a left mini-thoracotomy under real-time echocardiographic and fluoroscopic guidance, a pericardial biological valve prosthesis is implanted into the mitral orifice using a valve-in-valve technique with apical tether fixation. Between September 2021 and December 2024, the Tendyne system was implanted in 26 patients at our center. For statistical analysis, 21 patients with a follow-up longer than 6 months were included. The mean age was 77 years, with males comprising 50% of the cohort. In 88% of cases, the procedure was performed for on-label indications. The underlying pathology was classified as Carpentier type I, type III, or a combination of both. The mean Society of Thoracic Surgeons (STS) risk score (2023 version) was 15% for valve replacement and 11.1% for valve repair. Results Technical success—defined as successful implantation with mitral regurgitation reduction— was achieved in 100% of patients. In one case, a second attempt was required for valve deployment. One patient developed a paravalvular leak (grade II/IV), while all others showed no evidence of paravalvular or intravalvular regurgitation. In-hospital mortality occurred in one patient (on postoperative day 31, due to multi-organ failure). Two-year survival was 81.2%. One patient experienced BARC type 2 bleeding. Conclusions Mitral valve replacement using the Tendyne system appears to be a safe and technically feasible procedure with excellent short-term outcomes in high-risk patients. These results are favorable even when compared to other transcatheter techniques. Further long-term follow-up is warranted to confirm durability and clinical benefit.

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# NEAR-TOTAL RIGHT ATRIAL EXCISION AND COMPLEX RECONSTRUCTION FOR PRIMARY ANGIOSARCOMA DIAGNOSED DURING PREGNANCY

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***Keywords:*** *Cardiac Angiosarcoma, Right Atrial Resection, Peripartum Surgery*

**INTRODUCTION:** Primary cardiac angiosarcomas are rare, aggressive tumors, most often arising in the right atrium. Radical excision remains the cornerstone of treatment, usually with adjuvant chemotherapy. Objectives To report a case of right atrial angiosarcoma diagnosed in the peripartum period, managed with radical resection, complex atrial–caval reconstruction and tricuspid valve annuloplasty. Materials and Methods A 39-year-old woman presented during pregnancy with cardiac tamponade, treated by apical pericardiocentesis. Echocardiography revealed a right atrial mass. After cesarean delivery, multimodality imaging and biopsy confirmed primary angiosarcoma with extension to the interatrial septum, pericardium, right hemidiaphragm and inferior vena cava. Results Median sternotomy with cardiopulmonary bypass and aortic cross-clamping was performed. Near-total right atrial excision extended to the tricuspid annulus, sparing only the atrioventricular node area. The procedure included ligation of posterolateral branches, excision of the interatrial septum with unroofing of the coronary sinus and rerouting to the left atrium, pericardiectomy on the lesion side, and resection of involved pericardium, diaphragm and a cuff of inferior vena cava. Right atrium, septum and cavo-atrial junction were reconstructed with Hemashield patches; tricuspid valve competence was restored with a Medtronic Contour 30 ring; the diaphragm was repaired with polypropylene mesh. Post-reconstruction assessment confirmed unobstructed caval inflow and normal tricuspid function. Histology showed high-grade angiosarcoma (FNCLCC grade 3); margin status was indeterminate due to specimen fragmentation. The patient was discharged on day 15, completed six cycles of paclitaxel, and at nine months remains ECOG 1, asymptomatic and without recurrence. Conclusions Extensive right atrial resection with atrial–caval reconstruction, tricuspid annuloplasty and coronary sinus rerouting is feasible and central in managing right atrial angiosarcoma. Even peripartum, aggressive surgery plus adjuvant therapy can achieve short-term disease control. This case underscores the need for multidisciplinary collaboration among cardiothoracic surgery, cardiology, oncology and obstetrics.

# CARDIAC SURGERY OUTCOMES: A RETROSPECTIVE INSTITUTIONAL STUDY OF MORTALITY AND MORBIDITY

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***Keywords:*** *Cardiac Surgery, Morbimortality, Institutional Outcomes*

**INTRODUCTION:** The continuous monitoring and critical appraisal of morbidity and mortality in cardiac surgery are essential for assessing the quality of care and drivers of improvement. This study aims not only to present institutional data but to foster the debate on strategies that may further enhance effectiveness, safety and patient outcomes. The objective of this work is to provide a comprehensive characterization of cardiac surgery outcomes in our institution, focusing on morbidity and mortality, and to contextualize these findings within the broader framework of international results. A retrospective observational study was performed at the Unidade Local de Saúde de Gaia e Espinho (ULSGE) based on clinical data retrieved from institutional registries. The mortality was defined as surgical related death, within the hospitalization and after discharge within 30 postoperative days. The morbidity was defined as complications occurring during hospitalization or readmission within 30 postoperative days. The data were collected from October 2024 to July 2025 and all patients submitted to cardiac surgery at ULSGE were included in this study. The dataset was anonymized and subjected to detailed evaluation, enabling comparison with international results. The study population was the 935 cardiac surgeries performed within the study period. Of these, 88.54% were elective (N=828), 3.98% were urgent or emergent (N=37), 3.74% were reoperations (N=35), 2.14% were endocarditis (N=20) and 1.60% were acute aortic dissections (N=15). Valve surgery represented the most frequent intervention (36.68%, N=343), followed by coronary revascularization surgery (32.73%, N=306). During the study period, mortality was 2.78% (N=26), with a mean EuroSCORE II of 12.06 (median 11.04). Of the deaths recorded, 46.15% followed elective procedures, 42.31% urgent or emergent interventions, and 11.54% reoperations. Hemostatic revision was required in 4.92% of cases (N=46). Vasoactive support was necessary in 3.20% (N=30) and mechanical circulatory support in 0.75% (N=7). The mean hospital length of stay was 5.77 days, with a median of 4 days. In conclusion, the findings of this study indicate that cardiac surgery morbidity and mortality at ULSGE exhibit excellent morbidity and mortality outcomes, demonstrating clinical excellence comparable to international.

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# AORTIC ROOT SURGERY BEYOND BENTALL: SINGLE-CENTER EXPERIENCE AND OUTCOMES WITH THE DAVID PROCEDURE

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***Keywords:*** *Aortic Root Surgery, Valve-Sparing, David Procedure*

**INTRODUCTION:** Valve-sparing aortic root replacement (VSARR) represents a paradigm shift in the surgical treatment of aortic root disease, offering an alternative to the Bentall procedure. Preserving the native valve avoids prosthesis-related complications such as lifelong anticoagulation, valve failure and increased risk of endocarditis. The David procedure is the most widely used VSARR technique, mainly indicated in root dilatation with or without aortic regurgitation (AR) and selected cases of aortic dissection, particularly in younger patients and those with connective tissue disorders (CTD). Objectives To describe our single-center experience with the David procedure and assess early and mid-term outcomes and potential predictors of residual AR and reoperation. Materials and Methods A retrospective single-center case series of all patients undergoing the David procedure between November 2013 and July 2025 was analyzed. Data included demographics, EuroSCORE II, Marfan/CTD, bicuspid valve (BAV), prior surgery, left ventricular (LV) function, AR grade and aortic dimensions. Operative variables included urgency, cardiopulmonary bypass and cross-clamp times, cusp repair and concomitant procedures. Outcomes were AR at discharge and follow-up, complications, survival, NYHA class, reoperation and endocarditis. Associations between predictors and outcomes were tested using Fisher's exact or $\chi^2$. Results 43 patients (72% male, mean age 43±17 years) were included. 33% had Marfan, 5% other CTD, 23% BAV. LV function was good in 72%, moderate in 28%. Indications were root dilation with: severe AR (35%), moderate AR (28%), mild AR (19%); isolated root dilatation (7%); dissection (12%). Cusp repair was performed in 40%; concomitant procedures in 26%. Most cases were elective (88%). In-hospital and 30-day mortality were 0%. Complications included pacemaker implantation (7%), atrial fibrillation (16%), re-exploration (2%) and infection (2%). At discharge, AR was absent or mild in 93%. Median follow-up was 36 months. Survival was 95%; 74% were in NYHA I. Reoperation occurred in 5%, endocarditis in 2%. At last echocardiogram, AR was absent or mild in 93%, moderate in 7%. No significant associations with AR or reoperation were found. Conclusion The David procedure showed safe early and mid-term outcomes, with no perioperative mortality, low complications and preserved valve function. Larger, longer-follow-up studies are needed to assess durability and subgroup outcomes.

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# AORTIC VALVE REPLACEMENT IN PATIENTS OVER 80: EFFECTS ON AGE-ADJUSTED SURVIVAL

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***Keywords:*** *Aortic Valve Replacement, Octogenarian*

**INTRODUCTION:** Despite the growing use of transcatheter aortic valve implantation, the increase of the life expectancy also makes the surgical aortic valve replacement (AVR) an increasingly used procedure. Objective: Compare the survival of octogenarian patients undergoing isolated AVR with aged-matched general population and describe the need for reoperation and short-term hemodynamic data with Trifecta bioprosthesis. Methods Longitudinal, retrospective, single-center study, including a consecutive sample of patients aged over 80 years who underwent isolated AVR surgery(2011 and 2019). The primary outcome was long-term all-causes mortality (December 2022). Hospital mortality was defined as death during hospitalization or up to 30 days after surgery. The survival curve in the octogenarian cohort was compared with the curve in the general population, the latter collected from National Life tables (2011-2022). The software provided by the Massachusetts General Hospital Biostatistics Center and the R package ""OneSampleLogRankTest"" were used to compare the curves and apply the Log-Rank test and standardized mortality rate (matched for sex and age). The mean follow-up time was 4.5 years, and the maximum time was 10.2 years. Hemodynamic data were collected from the 1st transthoracic echocardiogram performed at a mean of 4 months postoperatively. Results: We included 163 octogenarian patients (mean age 82, maximum 89 years). The median EuroSCORE II was 2.36 (minimum: 0.98% and maximum: 13.16%). Most patients were female (67%), and the main pathology was aortic stenosis (87%). One-third of the patients had NYHA III-IV classification. Hospital mortality was 6%. After excluding these patients, the survival rate of the cohort undergoing AVR vs. expected in the population at 1st, 3rd, 5th, and 10th years were 93.5% vs. 93.7%, 86.3% vs. 79.5%, 67.8% vs. 63.4%, and 24.8% vs. 25.3%, respectively. The standardized mortality rate (0.92) revealed no significant differences between the observed and expected (confidence interval: 0.70-1.21, p = 0.49). Only one patient underwent a transcatheter valve-in-valve procedure due to structural valve deterioration at 4 years of follow-up. In the follow-up echocardiogram, the mean aortic valve gradient was 11 ± 4 mmHg, and the functional area was 2.0 ± 0.4 cm2. Conclusion: In a clinical scenario of our service, AVR surgery proved to be effective in the octogenarian cohort, as it was close to that expected in the national population.

# CLIMATE FACTORS AND THE RISK OF ACUTE TYPE A AORTIC DISSECTIONS: A MACHINE LEARNING APPROACH

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***Keywords:*** *Aortic Dissection, Weather, Machine Learning*

**INTRODUCTION:** Acute aortic dissection type A (AAD) is the most emergent aortic pathology. Some studies have reported a correlation between AAD and weather conditions, although the association is weak and populations are small. However, no studies have been published using new analysis approaches such as machine learning. Objectives The aim of this work is to assess the association between occurrence of AAD and climatic conditions using a machine learning approach. Materials and Methods Observational, retrospective, multicenter study including patients submitted to emergent surgery with AAD between January 2007 and December 2022. Primary endpoint was to determine the influence of weather conditions in the incidence of AAD. The following variables from Meteoblue global weather archive were included: temperature, relative humidity, pressure, precipitation, cloud cover, solar radiation, wind gust, speed and direction. A machine learning approach with Kernel Density Estimation and logistic regressions was used. Results 520 patients were included, with 185 (35,6%) being female. There was a clustering of cases in early Autumn and early Spring, with a drop-off a the end of the year. Using a logistic model we assessed the association between each of the individual variables with the cases, against a randomly selected set of days. None of the variables was associated with the occurrence of AAD. The variables with better performance (temperature, humidity, mean sea level pressure, evapotranspiration and vapor pressure deficit) were better explored, using a balanced dataset generated from a constructed synthetic dataset that was concatenated with the real dataset. Each variable was then independently assessed with a logistic model. None had a convincing association with AAD. For these 5 variables we also tested the temporal tendency that could predict AAD in the 10 preceding days. No significant tendencies were detected. Conclusion None of the climate variables studied is associated with the occurrence of AAD. The results may be explained by the few weather variations observed currently. Patient's comorbidities may be more important than environmental factors. However, other climate variables not included in the analysis may also influence the occurrence of AAD.

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# DEL NIDO CARDIOPLEGIA EFFICACY AND SAFETY IN ADULT MULTIVALVULAR REOPERATIVE CARDIAC SURGERY: A PROPENSITY MATCHED COMPARISON

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***Keywords:*** *Cardioplegia, Reoperative, Multivalvular*

**INTRODUCTION:** Myocardial protection is the cornerstone of cardiac surgery with cardiac arrest. Del Nido (DN) cardioplegia use in adults has increased due to its reduced cost, but safety and efficacy data is missing. Specifically, in reoperative cardiac surgery, few studies have reported DN efficacy and safety. Objectives The aim of this work is to evaluate the feasibility and safety of Del Nido cardioplegia in reoperative cardiac surgery Materials and Methods Observational, retrospective, single-center study including patients submitted to reoperative cardiac surgery between January 2017 and February 2020. Primary endpoint: safety and efficacy of Del Nido cardioplegia. Secondary outcomes: survival at 30 days. A propensity score match (PSM) was used to adjust both groups. Continuous variables were analyzed with t-test; categorical variables with chi-square or Fisher. Results 77 patients were included, with 48 using Buckberg (BB) cardioplegia and 29 DN. After PSM, 29 patients were included in each group. Most patients were submitted to surgery due to prosthesis dysfunction (31%), followed by prosthethic endocarditis (24% in BB, 17.2% in DN). Mean age in BB groups was 61.2 (SD 13.6) in BB group, ad 64.2 (SD 16) in DN group. No significant differences were observed between the two groups regarding the rate of cardiogenic shock (21% BB vs 10% DN, P=0.47), acute kidney injury (55% BB vs 45% DN, P=0.43), definitive pacemaker (10% BB vs 10% DN, P=0.43), neurologic complications (3% BB vs 10% DN, P=0.61) and atrial fibrillation (14% BB vs 31% DN, P=0.61). Median troponin levels 1h (BB 793.7 +/- 889 vs DN 1398 +/- 2343, P=0.119) and 24h after surgery (BB 1199 +/- 1720 vs DN 1200 +/- 1064, P=0.465) were similar between both groups, as other organ lesion markers (creatinine, urea, creatinine kinase, AST, ALT, Bilirubin). Survival at 30days was 82.8% in BB and 89.7% in DN (P=0.438). Conclusion DN cardioplegia is non-inferior to BB in reoperative multivalvular surgery. No differences were observed in postoperative complications, and both groups had similar organ lesion markers levels. Survival was similar between both groups. DN is a safe option in reoperative multivalvular surgery in adults.

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# IS THE INCREASE IN CARDIOPULMONARY BYPASS TIME ASSOCIATED WITH PERIPHERAL CANNULATION IN REOPERATIONS HARMFUL WHEN COMPARED TO CENTRAL CANNULATION?

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***Keywords:*** *Cardiopulmonary Bypass, Peripheral Cannulation, Reoperations*

**INTRODUCTION:** Femoral cannulation (FC) during cardiopulmonary bypass (CPB) allows decompression of the heart, reducing the risk of injury to structures in reoperations. However, CF is associated with more extended periods of CPB. We intend to assess the impact on different outcomes (blood products, hemolysis, organ dysfunction, and support) of increased CPB time associated with CF in multivalvular reoperations in adults. Methods: A retrospective study included 77 patients submitted to the first reoperation from January 2017 to January 2020 [Group 1 (G1): central cannulation (Aortoatrial) 40 patients; Group 2 (G2): peripheral cannulation (Femoral-femoral) 37 patients]. Primary endpoint: safety/efficacy of femoral cannulation in reoperations. A Propensity Scored Match considering comorbidities were performed but it was not helpful since new differences in Euroscore II appeared. Both groups had similar demographic. Continuous variables with t-test; categorical variables with chi-square or Fisher with Graph Pad Prism®. Results: No patient from G2 was converted to G1. There were no significant differences between groups for demographic and preoperative factors. Patients in G2 had longer CPB time (G1 109.1±42.01 vs. G2 141.7±66.34 min, *p=0.0137), however, with no significant difference in aortic cross-clamping time (G1 141.7±66.34 vs. G2 89.23±40.63 min, p=0.6034). Postoperative organic injury markers (Creatinine kinase, Bilirubin, Troponin T, and Hematocrit) were similar in both groups for immediate postoperative and 24h postoperative measurements. Acute kidney injury was slightly lower in group 1 but not significantly lower (G1 42.5% vs. G2 62.2%, p=0.1113). There was no increase in postoperative bleeding (G1 5% vs. G2 5.4%, p>0.9999). Furthermore, no significant differences were observed regarding the need for blood products [platelets: (G1 62.5% vs. G2 78.7%, p=0.1043); Erythrocytes: (G1 77.5% vs. G2 83.8%, p=0.5715)]. Inotropic support (G1 92.5% vs. 97.3%, p=0.6161), ventilation time, and ICU/hospital stay were also not significantly different. Conclusions: The longer CPB time associated with femoral cannulation, compared to central cannulation, in reoperations, does not seem to increase hemolysis, the use of blood products, the need for support, and/or organ dysfunction. Thus, this work seems to corroborate the option of choosing the percutaneous femoral vascular access for CPB in multivalvular reoperations.

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# ASSESSING THE PROGNOSTIC VALUE OF THE PENN CLASSIFICATION IN ACUTE AORTIC DISSECTION: A SURVIVAL AND RISK ANALYSIS

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***Keywords:*** *Penn Classification, Acute Aortic Dissection, Malperfusion*

**INTRODUCTION:** Acute aortic dissection (AAD) is a life-threatening condition with persistently high early mortality, especially in patients presenting with malperfusion or hemodynamic instability. Accurate risk stratification is essential to guide perioperative management and anticipate complications. The Penn Classification categorizes patients based on clinical presentation, providing a simple framework for prognostic assessment. However, external validation of this system has been limited in recent years. Objectives: To identify predictors of 30-day and long-term mortality in patients undergoing surgery for AAD and to validate the prognostic value of the Penn Classification. Materials and Methods: This single-center retrospective study included 120 consecutive patients undergoing surgery for acute or subacute AAD between 2015–2024. Mean age was 59.9 ± 13 years, 70% male; Complete follow-up for all-cause mortality (mean 34.7 ± 28.1 months). Primary endpoints were 30-day mortality, long-term mortality, and a composite endpoint of major complications. Secondary endpoints included individual complications, reoperation, and length of stay. Statistical analyses included logistic and Cox regression, Kaplan-Meier survival, and ROC curve for Penn Class discrimination. Results: Clinical severity was classified as Penn Class A in 23.3%, B in 26%, C in 36.7%, and B+C in 18.3%, with a mean EuroScore II of 12% ± 11.9%. The 30-day mortality was 15.8%, and major complications occurred in 38.3% of patients. Multivariable logistic regression identified post-operative myocardial infarction, gastrointestinal complications, and Penn Class B+C as independent predictors of 30-day mortality. Increasing Penn Class was strongly associated with higher hazard ratios: Class B HR 9.76 (95% CI: 1.82–52.24, p=0.008), Class C HR 12.68 (95% CI: 2.40–66.92, p=0.003), Class B + C HR 22.10 (95% CI: 3.37–145.09, p=0.001). The ROC curve demonstrated good discrimination (AUC = 0.759). Kaplan-Meier survival curves revealed a progressive decline in survival over time. Conclusions: The Penn Classification was externally validated, showing strong predictive accuracy for 30-day mortality and long-term survival. This study confirms its clinical utility as a simple and effective tool for preoperative risk stratification in patients undergoing surgical repair of AAD.

# POSITIVE FLUID BALANCE DURING AORTIC VALVE REPLACEMENT: CAN WE PROTECT THE KIDNEY?

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***Keywords:*** *Cardiopulmonary Bypass, Acute Kidney Injury, Fluid Balance*

**INTRODUCTION:** Aortic valve replacement (AVR) remains the gold standard for low-risk patients. Haemodilution and increased capillary permeability during cardiopulmonary bypass (CPB) increase the risk for tissue oedema. Fluid balance (FB) composition/amount to avoid or reduce post-CPB organ dysfunction is still controversial. We aim to evaluate the effect of intraoperative FB on renal protection. Methods: Single-center retrospective study including 265 patients submitted to non-emergent AVR (January 2016 to January 2018). According to their post-operative FB, patients were allocated into three groups: Group 1 [negative fluid balance (n=38)]; Group 2 [positive FB ≤ 1500mL (n=185)]; Group 3 [positive FB >1500mL (n=42)]. FB was calculated with the sum of intraoperative intravenous fluids, priming and cardioplegia, subtracting diuresis and residual priming. Primary endpoint was post-operative outcomes [ventilation time, hemodynamic support, blood transfusion, acute kidney injury (AKI)]. Secondary endpoint was survival. Continuous variables were analysed with t-test; categorical variables with chi-square or Fisher-test; survival with Kaplan-Meier with GraphPad Prism®. Results: Demographic/clinical characteristics were similar between the three groups(p>0.05), as well as CPB and cross-clamp times (p=0.1646 and p=0.2077, respectively). No significant differences were found concerning the hemodynamic support necessity(p=0.0928), blood transfusion(p=0.8226) and atrial fibrillation(p=0.7793). Ventilation time was higher in group 1 (10.22±2.37 h), comparing to group 2 (6.36±0.39 h; **p=0.0057) and 3 (4.91±0.39h; **, p=0.0299). Negative FB increases the risk of AKI compared to group 2 (*, p=0.018; OR=1.645) and 3 (**, p=0.0075; OR=2.174).Group 1 had: 1)lower diuresis (207.5±106.4 mL) during surgery compared to group 2 (219.09±226.8 mL; ns, p=0.2691) and 3 (486.88±897.6mL;***p=0.0003); 2)lower diuresis during the first 24h (2188±1012 mL) compared to group 2 (2910±947 mL;***, p=0.0003) and 3 (2916±945mL;**, p=0.0055); 3) higher creatinine levels at 24h (1.23±1.11 mg/dl) compared to group 2 (1.12±0.66 mg/dl;*, p=0.0242) and 3 (1.07±0.57 mg/dl;**, p=0.0089); and 4)higher incidence of oliguria (15.8%) during the first 24h compared to group 2 (1.1%,***, p=0.0004; OR=17.16) and 3 (0%,**p=0.0092; OR=17). All groups had similar cumulative doses of furosemide at 24h (ns, p=0.3650). At 40 months survival was lower in group 1 (69.5%) compared to 2(83.9%, **, p=0.008) and 3(93%).

CARDIAC

# PRIMING IN CARDIOPULMONARY BYPASS: EFFECTS ON PERIOPERATIVE HEMATOCRIT PROFILES IN MANNITOL VS. NON-MANNITOL GROUPS

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***Keywords:*** *Cardiopulmonary Bypass, Mannitol, Blood Products*

**INTRODUCTION:** The use of Mannitol in adult cardiac surgery with cardiopulmonary bypass (CPB) is currently not recommended to reduce postoperative acute kidney injury. However, the effect of priming with Mannitol on hematocrit management due to its diuretic effect remains unclear. Our aims were to study the longitudinal profile of hematocrit with mannitol and to evaluate its impact on transfusions. Methods: Single-center retrospective study including 757 patients undergoing non-emergency cardiac surgery with CPB (January 2018 - October 2021). According to the use of Mannitol in CPB priming, patients were allocated into 2 groups: "With Mannitol" (n=328) or "Without Mannitol" (n=429). The primary outcome was the need for red blood cell (RBC) transfusion, analyzed using the Fisher test. A mixed linear regression with fixed and random effects was modeled with RStudio software to determine perioperative longitudinal profile of hematocrit. Results: Demographic and laboratorial tests were similar between the two groups, as well as CPB and cross-clamp times. The dependent variable was hematocrit, and the independent variables were groups and time (Baseline, 5 measurements during CPB and 24h postoperatively), as well as the interaction between these. The time effect has a strong negative effect on hematocrit even without considering the group [-5.66±0.27 (p

# THE TRAPPED LEAFLET: INTERMITTENT BIOPROSTHETIC AORTIC VALVE MALFUNCTION PRESENTING AS CARDIOGENIC SHOCK

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***Keywords:*** *Bioprosthetic Valve Failure*

**INTRODUCTION:** A 74-year-old male with a history of hypertension, type 2 diabetes, dyslipidemia, chronic kidney disease (baseline creatinine 1.5–1.9 mg/dL), left radical nephrectomy (2017), and prior aortic valve replacement with a Trifecta 23 bioprosthesis (2017) was admitted in August 2025 after syncope and chest pain, preceded by intermittent angina. Previous transthoracic echocardiography (2024) had shown a normally functioning prosthesis (gradients 21/11 mmHg) and preserved biventricular function. On admission (2025), he presented with recurrent transient loss of consciousness, pulseless electrical activity, and alternating systolic blood pressure between 60-160 mmHg. ECG showed diffuse ST-segment depression, and ST elevation in aVR. Echocardiography revealed low prosthetic gradients with mild regurgitation but new severe left ventricular dysfunction. Coronary angiography demonstrated no obstructive lesions. He was admitted in the cardiology department with the diagnosis of cardiogenic shock of unknown cause. On day 1 after admission, he developed recurrent chest pain and severe hypotension (60/40 mmHg), progressing to pulseless electrical activity promptly reversed with manual compressions. Arterial blood gases revealed lactate 7.8 mmol/L and metabolic acidosis. Emergent repeat catheterization demonstrated severe intraprosthetic aortic regurgitation, confirmed by echocardiography. Given refractory hemodynamic instability, emergent reoperation was performed with explant of the Trifecta 23 prosthesis and implantation of a Resilia 21 bioprosthesis. Intraoperative inspection revealed intact leaflets but fusion of stent posts with the aortic root, likely related to abnormal sinotubular junction anatomy, causing intermittent leaflet entrapment. Postoperative course was complicated by transient type 1 respiratory failure requiring high flow oxygen therapy and acute kidney injury (creatinine peak 2.64 mg/dL), without dialysis. Inotropes were discontinued on postoperative day 2. At discharge, creatinine had returned to 1.29 mg/dL. Echocardiography showed a normally functioning prosthesis with normal cusp mobility, transprosthetic gradients 34/19 mmHg, and preserved biventricular function. At 1-month follow-up, the patient was asymptomatic and had returned to his normal daily activities. This case illustrates the rare but catastrophic presentation of acute bioprosthetic valve failure, where early recognition and surgical intervention were crucial for patient recovery.

CARDIAC

# FULL VERSUS MINI-STERNOTOMY FOR ISOLATED AORTIC VALVE REPLACEMENT: SINGLE CENTER RETROSPECTIVE COHORT

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***Keywords:*** *Mini-Sternotomy, Surgical Aortic Valve Replacement*

**INTRODUCTION:** Mini-sternotomy (MS) is a minimally invasive surgical technique used as an alternative to the conventional full sternotomy (FS) for surgical aortic valve replacement (SAVR). Existing literature on clinical outcomes, morbidity and mortality after MS remains scarce and inconsistent. This study aims to compare intraoperative and early and mid-term postoperative clinical outcomes, in patients who underwent elective isolated AVR through MS vs. FS. Methods: In this retrospective, single-center study, patients who underwent elective isolated AVR through MS from 2011 to 2019 were included. An optimal 1:1 Mahalanobis Distance matching was implemented to compare FS with MS. Absolute standardized mean difference was used to compare preoperative variables between groups. Hospital mortality was defined as in-hospital or within the first 30 days after surgery. Survival and need for reoperation were accessed in December 2023. Immediate postoperative outcomes were assessed using conditional logistic regressions and time-to event outcomes were assessed through Kaplan-Meier curves and stratified Cox proportional hazard models. Results: A total of 136 patients were analyzed (68 in each group), with a mean age of 73 ±7 years, 62% being male. MS showed high risk of prolonged aortic cross-clamp time (OR: 3.57, 95% CI: 1.49-8.55, p=0.004) and cardiopulmonary bypass time (OR: 3.16, 95% CI: 1.47-6.81, p=0.003). There were no differences between groups regarding early postoperative outcomes, as well as long-term mortality (HR: 1.13, 95% CI 0.37-3.45, p=0.829) and freedom from prosthesis-related reoperation (HR: 0.20, 95% CI 0.02-1.74, p=0.145). Conclusion: There were no survival differences between 25 MS and FS, despite prolonged intraoperative times. Limited sternotomy may be a comparable, alternative approach for SAVR, although this study and available evidence are still lacking in power to demonstrate significant differences in most clinical outcomes.

CARDIAC

# HTK-CUSTODIOL VERSUS BLOOD CARDIOPLEGIA: COMPARISON OF MYOCARDIAL PROTECTION IN AORTIC VALVE SURGERY

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***Keywords:*** *Myocardial Protection, HTK, Buckberg*

**INTRODUCTION:** Cardioplegia-induced cardiac arrest remains the most widely used and reliable strategy for myocardial protection in cardiac surgery, but the absence of consensus on the optimal solution highlights a critical gap in evidence-based practice. Aim: To compare biomarkers of myocardial injury and clinical outcomes between Buckberg cardioplegia (BC) and HTK-Custodiol (HTK) in aortic valve surgery (AVS). Methods: Longitudinal, retrospective, single-center study including adult patients undergoing AVS in 2023. Exclusion criteria were urgent/emergent/salvage procedures, use of other myocardial protection solutions, previous cardiac surgery, active infective endocarditis, myocardial infarction 90 days prior. The impact of cardioplegia type on postoperative CK-MB and cTnI cumulative release, estimated by trapezoid-derived area under the curve, and clinical outcomes were studied using multivariable regressions and univariable comparisons. Results: 239 patients were included (56% male, mean age 69±11 years). BC was used in 75 (31%) and HTK in 164 (69%). BC patients tended to be older (71±8 vs. 67±12 years; p=0.058). Baseline differences were limited to valve pathology: aortic stenosis predominated in both groups (BC:85% vs. HTK:79%), mixed aortic disease more frequent with BC (12% vs. 6%) and aortic regurgitation in HTK (15% vs. 3%), with a trend toward larger left ventricles (LV) in HTK (50±12 vs. 47±7mm; p=0.064). LV myectomy was the most common concomitant procedure (30%), significantly more frequent in HTK (10% vs. 3%; p=0.041). Hot shot was predominantly used with BC (93% vs. 19%) and ultrafiltration in HTK (85% vs. 11%). Ventricular fibrillation after cross-clamp release was more frequent with HTK (29% vs. 15%; p=0.019). Univariable comparison of primary outcomes showed higher CK-MB in BC at ICU admission (30 vs. 25ng/mL; p=0.040) and 12h post-surgery (31 vs. 26ng/mL; p=0.045). However, multivariable logistic regression showed cardioplegia type does not independently influence this enzyme (OR 0.80; CI95% 0.40–1.56; p=0.500). For cTnI, neither univariable nor multivariable analyses revealed differences between groups, with cross-clamp time emerging as the sole predictor of higher cumulative release (OR 1.02; CI95% 1.01–1.04; p=0.002). Conclusion: In this single-center study, myocardial injury and clinical outcomes were comparable between BC and HTK. Further research is warranted to establish individualized, risk-based myocardial protection strategies.

CARDIAC

# EFFECT OF PULMONARY HYPERTENSION ON OUTCOMES OF MITRAL VALVE SURGERY

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***Keywords:*** *Pulmonary Artery Pressure, Mitral Valve Surgery, Pulmonary Artery Pressure*

**INTRODUCTION:** The relevance of pulmonary hypertension on the outcome of mitral valve surgery remains controversial. This cohort study aimed to assess how the severity of preoperative pulmonary hypertension influences mortality and length of hospitalisation following mitral valve surgery. Patients and methods Our group collected data from 236 patients who underwent mitral valve surgery in our centre from 2020 to 2023. A p value< 0.05 was considered significant for statistical analysis. Results This study divided the patients into three groups based on preoperative estimated pulmonary artery systolic pressure: no pulmonary hypertension (60 mmHg). During follow-up, 10.6% patients died, 8.5% in the first group, 10.8% in the second and 12.3% in the third. All-cause or in-hospital mortality did not have a significant difference between groups (p=0.795 and 0.826 respectively) or association with pulmonary hypertension severity (p=0.79 and 0.96 respectively). There was a significant association between severe pulmonary hypertension and length of hospitalisation. Conclusion Preoperative pulmonary hypertension does not seem to increase the mortality risk following mitral valve surgery. However, severe pulmonary hypertension may contribute to a more prolonged hospitalisation.

CARDIAC

# LESS-INVASIVE AORTIC VALVE REPLACEMENT: MID-TERM COMPARATIVE SINGLE-CENTER STUDY

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***Keywords:*** *Aortic valve replacement, Hemi-sternotomy, Full-sternotomy*

**INTRODUCTION:** Less invasive aortic valve replacement has proved to be a safe approach for the treatment of aortic valve disease and is associated with reduced blood loss and transfusion requirements, reduced intensive care and length of hospital stay, less pain and improved aesthetic appearance as quality of life. OBJECTIVES: The aim of this study was to compare single center 4-year results of surgical isolated aortic valve replacement by upper hemi-sternotomy approach versus classic full sternotomy. METHODS: We reviewed 781 patients who underwent surgical aortic valve replacement, 562 patients by less invasive approach – upper hemi-sternotomy by 3rd and 4th right intercostal space (Group A) – and 219 patients by full sternotomy (Group B) from January 2021 to March 2024. Patients underwent combined procedure with aortic valve replacement were excluded. We compare the early and mid-term outcomes, in-hospital death, hospital length of stay and a subgroup survival analysis. RESULTS: No differences were found in pre-operative data between groups except for atrial fibrillation 9,7%VS19,6%(p=0,001) and Euroscore II 1,7±2,6%VS3,3±7,4% (p=0,001). Associated procedures more common on group B: transannular aortic root enlargement (p=0,001), IV septum myectomy (p=0,12) and left atrial appendage occlusion in (p=0,11). The mean extra-corporal circulation time was 80,9±23,2 VS 75,4±33,2min (p=0,03) and aortic cross-clamping time 59,01±16,65 VS 55,56±22,05min (p=0,02). About postoperative data, the results were similar except for shorter ventilation time >12 hours in group A (p=0,03). The pleural effusion/pneumothorax with chest drainage, stroke, early prosthetic endocarditis and redo surgery due to cardiac tamponade were less frequents in group A, however without statistical difference. Four patients (0,7%) needed intra-operative conversion to sternotomy. The mean timing to discharge was shorter in group A (p=0,006)). The 30-day mortality (p=0,534) and the 4-year survival rate were similar (p=0,696). About patients over 75years old, the 30-day mortality (p=0,65) and the 4-year survival rate were also similar (p=0,45). CONCLUSIONS: From the perspective of saving lives, the results of single center casuistic about minimally invasive aortic valve replacement approach were very acceptable with shorter ventilation time and mean timing to discharge without additional morbidity and mortality. Even in older patients this procedure showed to be very safe and effective.

CARDIAC

# EXTRAVASCULAR IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR FROM A CARDIAC SURGERY PERSPECTIVE - INITIAL EXPERIENCE OF A TERTIARY CENTER

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***Keywords:*** *Extravascular implantable cardioverter defibrillator; cardiomyopathies, sudden cardiac death*

**INTRODUCTION:** Implantable cardioverter-defibrillators (ICDs) are considered an effective procedure in the prevention of sudden cardiac death. Traditional implantable systems rely on transvenous accesses with intracardiac lead positioning. The new substernal extravascular ICD (EV-ICD) is considered a recent technical evolution that avoids transvenous or intracardiac complications maintaining excellent defibrillation and antitachycardia pacing features. Patient management is guided by a multidisciplinary approach between cardiology, cardiac surgery, radiology and anesthesiology. Objective Evaluation of the initial experience of the substernal EV-ICD system in a tertiary hospital. Methods Retrospective observational study (between November 2024 and June 2025) of a new EV-ICD with analysis of patient characteristics, implantation technique, functional parameters and clinical outcome. Results A total of 12 patients were included, with a mean age of 37,3 years (range 19 – 59), 25% were female. Main diagnosis included hypertrophic cardiomyopathy (n=5), left ventricular non-dilated cardiomyopathy (n=3), non-ischemic dilated cardiomyopathy (n=1), Brugada syndrome (n=1), arrhythmogenic right ventricular dysplasia (n=1) and polymorphic ventricular tachycardia (n=1). Patients characteristics are described in table 1. The mean procedural duration was 68,2 minutes (CI: 60-78). Mean fluoroscopy time was 3,9 +/- 1,4 minutes. Defibrillation threshold testing was successfully performed in all patients with no external rescue defibrillation necessary. There were no procedural and peri-procedural complications. During three months follow up device interrogation showed no sustained arrhythmias. Two patients experienced an inappropriate shock, one due to oversensing of myopotentials and the other due to sinus tachycardia. There were no lead migrations, battery issues or sensing failures. Conclusion The new substernal EV-ICD system is a safe, reproducible procedure and presents an alternative for particular patient groups such as young patients with extended life expectancy. Multidisciplinary approach with cardiac surgery support during the procedure is required. Inappropriate shocks are a concern that has to be further investigated.

CARDIAC

# PERMANENT PACEMAKER IMPLANTATION IN ADULTS AFTER CARDIAC SURGERY: INCIDENCE, PREDICTORS, AND LONG-TERM FOLLOW-UP

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***Keywords:*** *Postoperative complications, Permanent pacemaker, Conduction disturbances*

**INTRODUCTION:** Permanent pacemaker implantation after cardiac surgery is a relevant complication, associated with increased morbidity and longer hospital stay. The reported incidence, timing of implantation, and long-term pacing dependency vary across studies, and the determinants of long-term outcomes remain incompletely understood. Objectives We aim to evaluate the incidence and timing of permanent pacemaker implantation after cardiac surgery, assess long-term pacing dependency, and identify perioperative risk factors. Materials and Methods We performed a retrospective, observational study including all adult patients who underwent cardiac surgery at a tertiary center between November 2020 and September 2024. Data collection included baseline pathology, type of surgery, preoperative EKG abnormalities, intra-operative events (cardiopulmonary bypass time, prosthesis type, interventricular septal myectomy), timing of pacemaker implantation and pacing dependence at follow-up. Results Between november 2020 and september 2024, 41 patients required permanent pacemaker implantation before discharge. The mean time between surgery and permanent pacemaker implantation was 11 days. Among these patients: 64% had aortic valve replacement surgery, 14% aortic valve endocarditis correction, 7% surgery for hypertrophic obstructive cardiomyopathy, 7% isolated mitral valve procedures, and 7% combined mitral and tricuspid procedures. The mean follow-up duration was 19.5 months. At the most recent follow-up, 70% of patients remained pacemaker dependent. No complications related to pacemaker implantation were observed. Statistically significant predictors of pacemaker implantation were aortic valve surgery, prosthetic endocarditis with local complications, and preoperative EKG rhythm abnormalities. Conclusions In this cohort, most patients undergoing permanent pacemaker implantation after cardiac surgery remained pacing dependent at 1 year. Aortic valve surgery, complicated endocarditis, and preoperative EKG abnormalities were independent predictors of pacemaker implantation. These findings may assist in perioperative risk stratification and guide clinical decisions regarding optimal timing of device implantation.

CARDIAC

# NEW-ONSET ATRIAL FIBRILLATION AFTER AORTIC VALVE REPLACEMENT: MINI-STERNOTOMY VERSUS COMPLETE MEDIAN STERNOTOMY — A SINGLE-CENTRE EXPERIENCE

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***Keywords:*** *Fibrilhação auricular, Esternotomia completa, Mini-esternotomia*

**INTRODUCTION:** Aortic valve replacement (AVR) via mini-sternotomy is considered safe and has been associated with less bleeding, reduced ICU and hospital length of stay, less pain, and superior cosmetic outcomes. However, the impact of surgical access on new-onset postoperative atrial fibrillation (AF) remains uncertain. **OBJECTIVES:** To compare the incidence of new-onset AF after AVR performed through mini-sternotomy versus complete sternotomy, and to explore the relationship between age/sex and new-onset AF. **METHODS:** We included patients undergoing isolated AVR via mini-sternotomy at the 4th right intercostal space and via complete median sternotomy between January 2021 and March 2024. New-onset AF was assessed during the index hospitalisation and updated to the most recent available clinical follow-up entry. RESULTS: We included 781 patients (mini-sternotomy n=562; complete sternotomy n=220). Mini-sternotomy: 65% male (n=364); age 67.8±10.7 years, with 28.4% ≥75 years (n=160). Preoperative aortic valve pathology: severe stenosis 77.6% (n=435), severe regurgitation 11.8% (n=66), both 10.6% (n=59). Prostheses: biological 75.4% (n=424). EuroSCORE II 1.7±2.6%. • Complete sternotomy: 65.9% male (n=145); age 69.0±10.1 years, with 35% ≥75 years (n=77). Aortic pathology: stenosis 81.4% (n=179), regurgitation 8.2% (n=18), both 7.3% (n=16). Prostheses: biological 77.7% (n=171). EuroSCORE II 3.33±7.39%. New-onset AF occurred in 22/562 (3.9%) after mini-sternotomy and 11/220 (5.0%) after complete sternotomy (p=0.497). Across both access types, patients with new-onset AF were older: median 72.0 [66.0–76.0] vs 70.0 [62.2–75.0] years (p=0.003). No association with sex was observed (p=0.248). **CONCLUSIONS:** In our study, surgical access (mini-sternotomy vs complete sternotomy) was not associated with statistically significant differences in the risk of new-onset postoperative AF. Overall, patients who developed new-onset AF were older, whereas sex showed no association with this arrhythmic outcome.

# TRANSPLANTE CARDÍACO UTILIZANDO DOAÇÃO CONTROLADA APÓS MORTE CIRCULATÓRIA (CDCD): EXPERIÊNCIA DE UM CENTRO EM BARCELONA

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***Keywords:*** *Transplante cardíaco, Doação após morte circulatória controlada (cDCD), Perfusão regional normotérmica (TA-NRP)*

**INTRODUCTION:** A doação controlada após morte circulatória (cDCD) tem sido progressivamente implementada em Espanha nos últimos anos ao ser uma estratégia relevante para expandir o número de dadores em alternativa aos dadores em morte encefálica. **OBJETIVOS:** Apresentar a experiência do nosso centro e o protocolo utilizado em transplante cardíaco com dadores cDCD, assim como os resultados clínicos a curto prazo. **MATERIAIS E MÉTODOS:** Estudo retrospectivo de todos os transplantes cardíacos com dador cDCD realizados no Hospital Universitari de Bellvitge entre maio de 2021 e julho de 2025. Foram recolhidos dados sobre as características dos dadores, o processo de extração cardíaca e tempos de isquemia, assim como as características dos receptores, manejo perioperatório e resultados pós-operatórios. **RESULTADOS:** Durante este período realizaram-se 38 transplantes cardíacos com dadores cDCD, correspondendo a cerca de um terço de todos os pacientes trasplantados no nosso centro durante este período. Os dadores apresentaram uma idade média de 45 anos, sendo a maioria do sexo masculino (79%). Mais de metade (55%) eram provenientes de outros hospitais. Foi realizada canulação periférica antemortem na totalidade dos casos. O perido agónico médio foi de 16 minutos, o tempo médio de isquemia quente foi de 15 minutos, e o tempo médio de perfusão regional normotérmica (TA-NRP) de 48 minutos. Os receptores eram maioritariamente do sexo masculino (63%) com idade média de 50 anos. Sete casos foram em contexto de urgência. Nos restantes, o tempo médio em lista de espera foi de 185 dias (10–810). Dez doentes tinham cirurgia cardíaca prévia e cinco tinham assistência ventricular. Cinco necessitaram suporte com ECMO no pós-operatório. O tempo médio de isquemia fria foi de 141 minutos. A média de internamento em UCI foi de 12,8 dias. As complicações mais frequentes foram disfunção ventricular ligeira a moderada e insuficiência renal aguda. A sobrevivência ao final do seguimento é de 100%. **CONCLUSÕES:** O transplante cardíaco com dadores cDCD utilizando TA-NRP seguido de preservação em frio demonstra bons resultados a curto prazo, comparáveis aos obtidos com dadores em morte encefálica. Actualmente, cerca de 30% dos transplantes cardíacos no nosso centro provêm de dadores cDCD, com tendencia crescente anual. Representam uma estratégia promissora para aumentar o número de dadores em Espanha.

CARDIAC

# DAVID PROCEDURE: SINGLE CENTER INITIAL EXPERIENCE

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***Keywords:*** *David Procedure, Institutional Outcomes, Cardiac Surgery*

**INTRODUCTION:** The David Procedure is one of the options for valve-sparing aortic root replacement. It involves replacing the damaged or aneurysmal aortic root while preserving the patient's natural aortic valve (AV). The valve is reimplanted into a Dacron graft, which replaces the dilated aortic root. It obviates the need for lifelong anticoagulation and has the potential of providing better outcomes than AV replacement. This study aimed to assess our initial institutional experience with this procedure, focusing on perioperative and follow-up outcomes and to contextualize these findings through critical comparison with contemporary international literature. A retrospective observational study was performed at the Unidade Local de Saúde de Gaia e Espinho (ULSGE) based on clinical data retrieved from institutional registries. The data were collected from January 2019 to August 2025. The mortality was defined as during follow-up and the morbidity as complications during hospitalization or readmission. The dataset was anonymized and evaluated. The study population was the 13 patients submitted to David Procedure performed during the study period. The cohort was predominantly male (84.6%; N=11), with a mean age of 52.7 years and mean EuroSCORE II of 5.5%. Among the patients, 53.85% (N=7) had a tricuspid AV, while the remainder presented with a bicuspid valve.All the patients received a partial J-shaped upper sternotomy: most procedures were performed through the 3rd intercostal space, with the exception of one patient operated through the 4th space. The results showed that there was 1 death (7.69%), 2 cases of cardiac tamponade (15.38%) and 1 re-sternotomy for bleeding (7.69%). Vasoactive support (>24h) was necessary in 23.07% (N=3) and 1 patient required concomitant mechanical support (7.69%). The mean hospital length of stay was 8 days, with a median of 6. Two patients did not experience any postoperative complications (15.38%). Surgical outcomes demonstrated that no patient developed severe aortic regurgitation (AR) and only 1 developed moderate AR in an average follow-up of 20 months. Reoperation was required in 2 cases (15.38%), but only 1 patient required AV and conduit replacement. Despite the limited cohort at ULSGE, the outcomes of the David Procedure were consistent with international outcomes, with in-hospital mortality of 1 patient, infrequent major complications, reoperation in 2 patients and 1 patient presenting moderate AR, supporting its safety and efficacy.