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FREE TOPICS
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• FT 01

A Case of Bentall–De Bono Associated with Simultaneous Pectus Excavatum Repair: Case Series Review

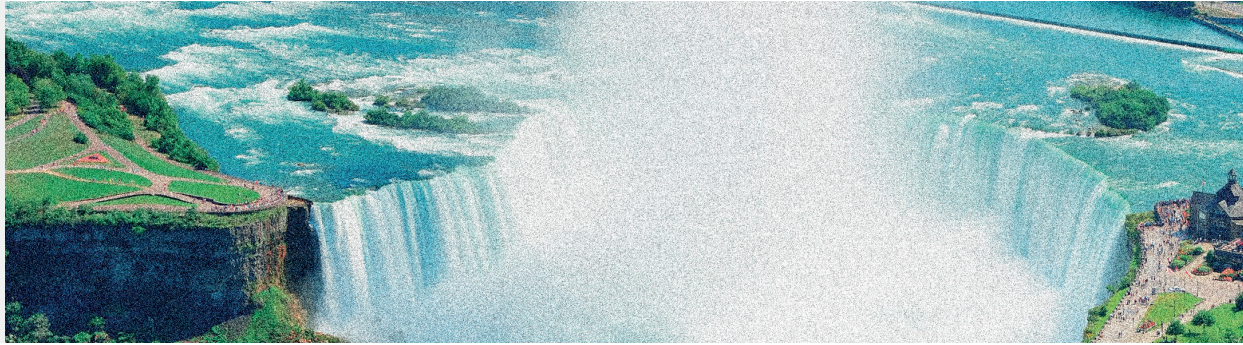
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Objective: The objective of this study was to report a case of a patient who underwent simultaneous surgical correction for pectus excavatum and ascending aorta aneurysm, with a favorable outcome for the patient.

Methods: Case report of a 58-year-old male patient, C.J.S., with a medical history of pectus excavatum and hypertension. During a clinical investigation of exertional dyspnea and thoracic pain, through complementary exams, the patient was diagnosed with ascending aorta aneurysm and aortic valve insufficiency. The surgical planning began with the approach by the Thoracic Surgery Team, who performed a dissection of the pectoralis major muscle bilaterally to access the last four costal cartilages. The periosteum was then opened, and the respective cartilages were resected, allowing the intercostal space to be enlarged and the lower ribs to move away from the pericardium. Then, the ascending aorta aneurysm repair was performed as planned and in the usual way, using the Bentall-De Bono technique with the implantation of a 25/28 Konect biological valved conduit with re-implantation of the coronary ostia.

Results: Among the 11 studies analyzed, 8 chose a simultaneous joint approach for correcting both ascending aortic aneurysm and pectus excavatum, while 3 studies opted for separate surgical procedures. None of them reported major complications following the procedures. As for the affected population, young male patients between 20 and 40 years old were more prevalent and dyspnea on exertion was the predominant complaint. The aortic aneurysms were mostly corrected by the Bentall-De Bono technique. The valve-sparing aortic root replacement surgery (David procedure) was performed in 2 studies where the preservation of the native aortic valve was prioritized. As for the pectus excavatum repair, no consensus was observed, and reports of 3 different techniques were found: Nuss procedure, Ravitch procedure and sternal turnover. In the diversity of techniques in the treatment of pectus excavatum, we must consider the individual anatomical variations and heterogeneity of aspects inherent to each patient. However, it can be challenging for the surgeon to define which is the best procedure and optimal surgical timing for pectus excavatum repair, especially in cases of more than one disease requiring surgical treatment.

Conclusion: The simultaneous correction of pectus excavatum and ascending aortic aneurysm can be performed with adequate planning. Besides detailed planning, a multidisciplinary team approach (involving specialists from thoracic surgery and cardiovascular surgery) is relevant to guarantee a safe procedure. Moreover, due to the anatomical variations in each case, individualization becomes necessary to perform a safe procedure for the patient. Thus, those two procedures, when performed in a single surgical time in selected patients, can yield satisfactory outcomes in the treatment of these comorbidities, when associated.



• FT 02

Analysis of the Difference in Degrees of Dilation of Woven and Knitted Dacron Grafts in the Postoperative Follow-Up of Patients Undergoing Aortic Surgeries: A Systematic Review of the Literature

Antonio de Jesus Chaves Junior, Julie Matos Boeloni, Ana Rita Santos da Cruz, Júlia Oliveira Medrado de Almeida, Marco Antonio de Sousa do Vale, Amanda Arrais Bento de Souza, Mariana Brandão da Silva Sousa, Mário de Souza Lima e Silva, Jackson Brandão Lopes

Introduction: It has been documented that Dacron graft dilation after abdominal aortic aneurysm repair is associated with complications such as anastomotic aneurysm and graft rupture. After hybrid repair of the aneurysm or dissection of the ascending aorta and aortic arch, dilation of the Dacron graft can lead to important complications such as endoleak and migration of the endoprosthesis.

Objective: The objective of this study was to analyze the difference in degrees of dilation of woven and knitted Dacron grafts in the postoperative period of aortic surgeries, based on a systematic evaluation of studies published in the main international and Latin American databases.

Methods: This work is a systematic review of the literature, collecting articles from PubMed, Cochrane, LILACS, and SCIELO databases. Clinical trials and cohorts that compared the degree of dilation of woven and knitted Dacron grafts in the postoperative period of aortic surgeries were included, regardless of publication year and language (English, Portuguese, or Spanish). The Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guidelines were followed.

Results: A total of 44 articles were found in the databases. Of these, 5 fully met the inclusion criteria; we identified three clinical trials (including one randomized trial), and two retrospective cohorts. In total, 408 patients were analyzed, corresponding to an adult population from centers in England, France, Japan, the Netherlands and the United States. Among them, 159 patients received woven Dacron prostheses and 249 received knitted prostheses. Publication dates ranged from 1994 to 1999. The included surgeries encompassed abdominal aortic aneurysm repair, aortoiliac reconstruction, and repair of the descending thoracic aorta. The follow-up time ranged from 6 days to 233 months among the patients in the studies, with an average time of 18.9 to 54 months. In all studies, a difference was found in the degree of dilation between woven and knitted Dacron grafts, with unanimous findings corroborating lower dilation in the postoperative follow-up for the woven type, with variations ranging from 2% to 25.5% and 3% to 49.2% for woven and knitted types, respectively, with statistically significant p-values. Some studies did not express the degree of dilation through absolute numbers, since an absolute value corresponds to different degrees of dilation depending on the initial diameter of the graft.

Conclusion: The number of studies found in the databases was limited. In addition, the comparative studies on this topic are relatively outdated. There is a scarcity of works that compare the degree of dilation between woven and knitted Dacron grafts in the ascending aorta and aortic arch. Another limitation found was an important variation in follow-up times across studies. These data corroborate the fact that more studies are needed on the subject, in view of the potential adverse effects,



such as anastomotic aneurysms and graft rupture in the abdominal aorta and migration of the prosthesis and endoleaks in hybrid procedures for pathologies of the ascending aorta and aortic arch, which are a consequence of the postoperative dilation of the Dacron graft. Finally, it was observed that the woven Dacron graft presents lower degrees of dilation during both early and late postoperative follow-ups.

● FT 03

Analysis of the Dilation of Dacron Tubular Graft in Early and Late Postoperative Period of Ascending Aorta and Aortic Arch Repair Surgeries

Mariana Brandão da Silva Sousa, Antonio de Jesus Chaves Junior, Julie Matos Boeloni, Ana Rita Santos da Cruz, Marco Antonio de Sousa do Vale, Jackson Brandão Lopes

Objective: Aortic diseases remain an important cause of cardiovascular mortality and morbidity, and an ongoing challenge to cardiologists and surgeons. The main treatment for such diseases is replacement with prostheses, either by conventional open surgery or hybrid correction, with the use of endovascular technique. The dilation of aortic prostheses is a documented phenomenon since the advent of abdominal aortic aneurysm repair using synthetic grafts. However, studies specifically focusing on the ascending aorta are scarce, although the inappropriate choice of a graft in this position in hybrid procedures can lead to important adverse effects such as prosthesis displacement and endoleak. The objective of this study was to determine the degree of dilatation of the woven and knitted Dacron tubes in the postoperative period of ascending aorta and aortic arch surgeries.

Methods: A retrospective analysis was conducted on 260 patients who underwent surgical repair of ascending aortic aneurysm and/or aortic arch aneurysm from 2016 to 2021, and 19 cases with pre- and postoperative CT scans available in the institution's Picture Archiving and Communication System (PACS) were retrieved for analysis.

Results: A total of 21 prostheses were implanted in the 19 patients, 3 of the knitted type, 14 with a woven tube, and 2 patients had both types of tubes implanted. The average diameter of the grafts was 26 ± 3 mm. In the postoperative period of ascending aortic and/or aortic arch surgeries, the growth of the woven and knitted Dacron tubes presented a mean of $12 \pm 8\%$ and $30 \pm 3\%$ ($P=0.04$), respectively. The mean age of patients was 51.8 ± 11 years, and 63.2% were male. The most prevalent comorbidity was systemic arterial hypertension, representing 68.4% of patients.

Conclusion: Knitted tubes have a higher degree of dilation than woven tubes, suggesting that the latter are more suitable for hybrid treatment.



• FT 04

Aortic Root Valve Reimplantation: 10 Years' Experience with Single Straight Tubular Graft

Fernando Piccinini, Adriana Aranda, Juan Mariano Vrancic, Juan Espinoza, Daniel Navia

Introduction: Valve-sparing aortic root replacement (VSRR) has emerged as an excellent alternative for patients with aneurysmal disease and root compromise while the aortic valve is structurally repairable. Beside the technical demands and learning curve, its safety and stability through years supports its growing application. Locally deprived of Valsalva prosthesis, we based our experience on straight single tube graft and report its impact on midterm outcomes.

Methods: From 2004 to 2022, 115 patients underwent VSRR surgery with David type I technique. Data were collected from a prospective database and outpatient clinic direct follow-ups. Pre- and postoperative evaluations were conducted through transesophageal echocardiography (TEE) and computed tomography (CT) scans on a periodic basis. Conversion to replacement was decided at surgeon's discretion. Primary outcomes were hospital morbidity and mortality, survival, freedom from aortic regurgitation (AR) grade >2 and valve-related reinterventions.

Results: The study cohort had an average age of 51 ± 15 years, with 80% of males. Marfan syndrome was present in 18% of the patients, and 29% had a family history of aneurysmal disease. Preoperatively, AR was classified as grade 0 in 10.4% of patients, 1 in 20%, 2/>2 in 69.6%. In addition, 17.4% of patients had a bicuspid configuration, and 65% were asymptomatic. The median aortic root diameter was 50 ± 6 mm. Intraoperative data: mean cross-clamp time of 165 ± 33 minutes and a mean CPB time of 186 ± 38 minutes. Additional direct valve treatment, mainly plication, were performed in 48% of patients. Postoperatively, 95% of patients showed off-pump residual AR grade 0/1. Conversion rate was 1.7%. The incidences of redo for bleeding, permanent pacemaker implantation, stroke, and hospital mortality were 4.3%, 3.4%, 0.8%, and 0.8%, respectively. At follow-up, the 10-year survival rate was 95.7%, and freedom from valve reintervention rate was 88.5% (median 3,373 days from VSSR) and freedom from AR >2 was 83.5%, with a residual eccentric jet and earlier experience identified as predictor factors.

Conclusion: The VSRR procedure is feasible, safe and stable upon time; the exclusive implementation of type I David with a single straight Dacron graft represents a valid option, as a simplified and reproducible operative with excellent short and long follow-up outcomes.



• FT 05

Clinical and Hemodynamic Outcomes of Surgical Rapid Deployment Aortic Valve Prosthesis

Diego Maia Martins, Frederico Carlos Cordeiro de Mendonça, Alvaro Daniel Ortuño Justiniano, Igor Gomes Cristo, Daniel Robert Alexander, Bruno Mamede Lins Brasiliense, Jeffer Luiz de Moraes, Jairo Pinheiro Junior, Jorge Henrique Yoscimoto Koroishi, Stevan Krieger Martins

Objective: To evaluate the outcomes of surgical aortic valve replacement (SAVR) using a rapid deployment valve, considering hemodynamic performance, clinical features, and complications.

Methods: From 2016 to 2023, 50 patients underwent aortic valve replacement surgery using the fast deployment valve system. Patients were selected from the surgical team database in a retrospective analysis, divided in 21 cases of isolated valve replacement and 29 cases of combined surgery. Inclusion criteria were patients eligible for SAVR with a rapid deployment valve. Of the total cases, 18 were performed with a minimally invasive approach, and 32 cases underwent conventional sternotomy. The primary outcomes were early mortality rates and postoperative transvalvular pressure gradients. The secondary outcomes included aortic cross-clamp and cardiopulmonary bypass times, device success (defined as absence of paravalvular leak) after SAVR, need for pacemaker implantation, and postoperative major neurological events (stroke and TIA) in 30 days.

Results: Patients aged 75 years (± 6.76), predominantly male (65.3%). Among them, 36 patients had pure aortic stenosis, showing a mean transvalvular gradient of 41,5 mmHg (± 14.3). Aortic regurgitation was present in 11 patients. Three patients presented severe aortic prosthetic valve dysfunction, requiring redo operation. Associated procedures included CABG in 20 patients, aortic root/ascending surgery in 11 cases and combined valve surgery in 5 cases. Early 30-day mortality occurred in 2 patients (4%), one due to coagulopathy and other from vasoplegic shock, both related to combined surgery. Isolated SAVR had a 6-month maximum transvalvular gradient of 20 mmHg (± 5.69) and the mean gradient was 10 mmHg (± 3.60), while in combined surgery these values were 16 (± 6.47) and 7 (± 4.00), respectively. The mean CPB and cross-clamp times were 60 min (± 16.95) and 48 min (± 15.44), respectively, for isolated SAVR, and 110 (± 34.72) and 83 (± 27.83) for a combined operation. The mean prosthesis size was 21. Two patients required a pacemaker implant after presenting a third-degree atrioventricular block. Three patients required pericardial drainage. Device success was achieved in all cases, confirmed by intraoperative transesophageal echocardiography. In late follow-up, one patient had minimal paravalvular leakage. One case had a non-disabling stroke. Patients with more than 3 years of follow-up demonstrated stable transvalvular gradients.

Conclusion: A fast delivery valve system promotes greater versatility for the surgical procedure, providing excellent hemodynamic profiles and reducing procedure duration, especially in combined surgeries, displaying postoperative benefits to patients with small aortic annulus. These outcomes evaluated during the time being reveal a feasible, safe, and effective operation, by abstaining sutures and reducing cross-clamp and CPB times. Thus, rapid deployment aortic valves can diversify the AVR procedure and improve outcomes, in selected cases previously contraindicated, such as bicuspid valves or aortic regurgitation.



• FT 06

External Wrapping of the Ascending Aorta in Patients with Chronic Stanford Type A Aortic Dissection

Leonardo Paiva Ohashi, Walter José Gomes, Pedro Reges Pereira Meira, Marcos Cruz Amaral, Rafael Queiroz de Souza Lima, Luiz Augusto de Andrade Costa, Márjory Medeiro Passos Teixeira, Mariana Chisté Ferreira, Maria Fernanda Santos Torres, Nelson Américo Hossne Junior

Objective: Surgery with ascending aorta replacement is the gold standard in most patients with Stanford type A aortic dissection. However, this conventional surgical treatment is associated with high hospital morbidity and mortality, especially in high-risk surgical patients. We report the initial series of procedures with external wrapping of the aorta in patients with chronic Stanford type A aortic dissection (>14 days after symptom onset) who were considered high-risk individuals for conventional treatment, after discussion and decision by the Heart Team.

Methods: Four patients with chronic Stanford type A aortic dissection considered high-risk for conventional treatment, underwent procedures with external wrapping of the aorta, ranging in age from 36 to 66 years. One patient had a renal transplant with initial graft dysfunction, another patient was 12 weeks pregnant, one patient had Marfan syndrome, was a Jehovah's Witness, and had previous undergone Bentall surgery with significant dilation of the thoracoabdominal aorta, and another frail patient had a previous coronary artery bypass grafting with all three coronary grafts patent.

Results: The average duration of the procedure was 2 hours and 30 minutes. The procedure was performed through a median sternotomy, with careful isolation of the dissected ascending aorta and wrapping with a bovine pericardial flap. No use of cardiopulmonary bypass or systemic heparinization was necessary. There was no mortality, and none of the patient required blood transfusion. One immunosuppressed patient had postoperative pneumonia, treated with antibiotics. The patient with extensive involvement where wrapping was extended to the aortic isthmus experienced temporary vocal cord paralysis resulting in hoarseness. During a mean follow-up of 5.2 months, all patients returned to their routine lifestyles. Periodic follow-up tomography scans showed no redilation of the treated aortic segments.

Conclusion: Consistent with literature results, the use of the wrapping technique was safe and provided satisfactory initial outcomes in this cohort of high-risk surgical patients, with patients returning to their normal lifestyles. Serial imaging examinations showed no aortic redilation. However, long-term follow-up is necessary to ensure the late effectiveness of the method.



• FT 07

Influencing Factors for Early Mortality after Surgery for Acute Aortic Dissection

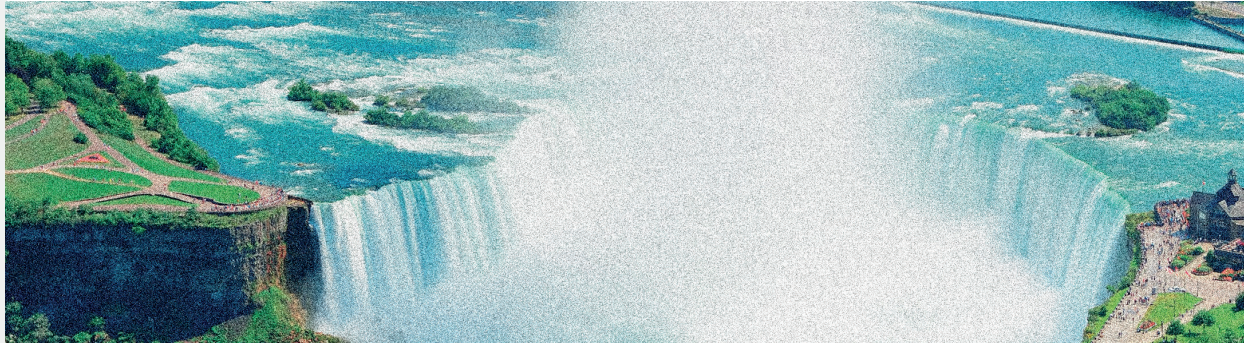
Lennart Bax, Till Joscha Demal, Josephine Beckenbauer, Franziska Sitzmann, Jens Brickwedel, Herrmann Reichensperne, Christian Detter

Objective: Postoperative early mortality rate for acute type A aortic dissection (ATAD) surgery ranges between 16% and 37%. Thus, aim of this study was to determine risk factors for early mortality in this cohort.

Methods: Between 01/2010 and 02/2022, 1,695 consecutive patients underwent aortic surgery at our center. Of these, 385 were operated on for ATAD. We retrospectively analyzed predictors for 30-day mortality using multivariable logistic regression analysis.

Results: Mean age was 63.7 ± 13.3 years ($n=131 >70$ years) with 68.8% male patients. EuroSCORE II was 14.5 ± 14.5 . Impaired renal function with a glomerular filtration rate <60 ml/min was present in 21.6% ($n=83$), reduced left ventricular function (left ventricular ejection fraction [LVEF] $<51\%$) in 25.2% ($n=97$) and 10.6% ($n=41$) suffered from heritable thoracic aortic disease (HTAD). Prior cardiac surgery had been performed in 6.8% ($n=26$). ATAD was complicated by malperfusion and/or aortic rupture in 43.4% ($n=167$) and 8.6% ($n=33$) suffered an acute preoperative stroke. Surgery on the aortic root was necessary in 22.9% ($n=88$) and arch procedures were performed as hemiarch replacement in 65.7% ($n=253$), conventional arch replacement in 10.9% ($n=42$) and frozen elephant trunk procedure in 15.6% ($n=60$). Concomitant coronary artery bypass grafting (CABG) was necessary in 10.4% ($n=40$) of patients. Hypothermic circulatory arrest (HCA) and selective antegrade cerebral perfusion (SACP) times were 41.6 ± 28.1 and 43.2 ± 34.3 minutes, respectively. The 30-day mortality was 19.7%. Multivariable logistic regression analysis revealed impaired renal function (OR 3.03, 95% CI 1.53-6.01), complicated ATAD (OR 2.75, 95% CI 1.41-5.35), concomitant CABG (OR 3.33, 95% CI 1.39-7.97), SACP >60 minutes (OR 2.64, 95% CI 1.33-5.23) and surgery on the aortic root (OR 1.2.76, 95% CI 1.25-6.10) as independent predictors for 30-day mortality. Presence of HTAD (OR 0.09, 95% CI 0.01-0.75) was an independent predictor for lower 30-day mortality. Age >70 years, LVEF $<51\%$, preoperative stroke, prior cardiac surgery, total aortic arch replacement and HCA >55 minutes were not significantly associated with survival.

Conclusion: Aortic surgery for ATAD is still associated with high postoperative mortality rates. Especially patients with complicated ATAD, concomitant aortic root surgery and CABG, as well as preoperatively impaired renal function, are at risk of high 30-day mortality while redo and total arch surgery, performed by experienced surgeons, do not increase the risk.



● **FT 08**

Initial Experience of a Single-Center with the Frozen Elephant Trunk Procedure in 21 Patients with Complex Aortic Disease

Lucas Henrique Prado Sousa, Diogo Assis Souza, Ricardo Barros Corso, Bruno Sepulveda Reis, Tatiane Sampaio de Souza, Tatiana Maia Jorge de Ulhoa Barbosa

Objective: To present the initial experience of a single service in managing complex aortic disease using the frozen elephant trunk (FET) technique.

Methods: A survey was carried out on patients who underwent aortic arch surgery at our institution using the FET technique for acute and non-acute type A dissection, between 2020 and 2023. This is an observational, analytical, and retrospective study. The sample consisted of 21 patients, from whom perioperative data such as 48-hour and 30-day mortality rates and neurological complications were retrospectively obtained from our electronic patient records. Categorical variables were expressed as percentages and continuous variables were presented as mean \pm standard deviation.

Results: The results found showed that among the patients, the mean age was 55 ± 10.3 years, with a male prevalence of 62%. In the preoperative evaluation, the average EuroSCORE II was $19.48 \pm 0.92\%$. Intraoperative data showed mean total CPB time of 135.7 ± 49 minutes and aortic clamping with a mean total time of 96.5 ± 40.7 minutes, and a mean total circulatory arrest time of 9 ± 1.4 minutes. The length of stay in the ICU was 6.9 ± 3.65 days and the total length of hospital stay was 21.5 ± 15.6 days, both data excluding deaths. In about 28% of cases, Evita Open Plus® was used and in 72%, Medtronic® aortic stent graft was used, associated with a Dacron graft with combined suture. Overall permanent stroke and spinal cord injury occurred in 9.1% of the survivor group. A single patient developed paraplegia. Regarding the evaluated outcomes, mortality rate at 48 hours was 14%, while at 30 days it was 22,2% of the sample.

Conclusion: The objective of this work was to show the initial results of a single service, using the FET technique for complex aortic diseases. The patient profile in the sample showed a high surgical risk through the calculation of the EuroSCORE II. Despite the high level of mortality, patients who survived had a relatively promising length of hospital and ICU stay. As for the neurological outcome, the number of ischemic events and spinal cord injuries were lower when compared to other studies. Complex aortic diseases continue to be a major challenge in the setting of cardiovascular surgery, so the purpose of the service is to present its progression of results over time, aiming to improve results and favorable outcomes.



• FT 09

Initial Experience with the Tirone David Technique for Aortic Root Aneurysm Repair in a Patient with Marfan Syndrome: A Case Report

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Introduction: Aortic root aneurysm is a dilation that occurs due to the weakening of the vessel tunics. It can be caused by several etiologies, including atherosclerotic disease, hereditary connective tissue diseases, such as Marfan syndrome and Ehlers-Danlos syndrome, systemic arterial hypertension, among others. In patients with aortic aneurysm with involvement of the valve apparatus, the Bentall-de Bono technique is traditionally used. Alternatively, the Tirone David technique allows aortic valve preservation and replacement of the aneurysmal portion of the root. We describe a first patient operated on with the aortic root preservation technique involving root replacement in our institution.

Methods: A 24-year-old male patient, diagnosed with Marfan syndrome, alongside hypertension and a strong family history of death from aortic aneurysm, presented with symptoms of dyspnea, intermittent chest pain, and dizziness. Chest tomography revealed aortic root ectasia, measuring 5x4.7 cm, with great enlargement of cardiac chambers. In specialized outpatient follow-up, an ascending aortic aneurysm, measuring 50 mm in diameter, was diagnosed. Given the high risk of sudden death from aneurysm rupture, urgent hospitalization and treatment were initiated. The transthoracic echocardiogram (TTE) showed sinuses of Valsalva with 51 mm, sinotubular junction (STJ) of 45 mm, ascending aorta measuring 50 mm, and preserved aortic valve, with normal transvalvular flow. The patient was operated on using the Tirone David technique, via median sternotomy, with aorto-atrial cannulation, a CPB time of 160 minutes and ischemia time of 125 minutes. The patient was extubated 5 hours after ICU admission. He remained in the ICU for four days. He was discharged from the hospital on the eighth postoperative day. Pre-discharge TTE showed preserved biventricular systolic function, normal positioning of the Dacron tube in the ascending aorta, a left ventricular ejection fraction (LVEF) 61%, and a normally functioning aortic valve, without residual reflux or signs of stenosis.

Discussion: For the correction of ascending aortic aneurysms, the vessel can be replaced by a prosthetic tube, associated or not with a valve prosthesis, depending on the integrity of the semilunar valves and the annulus. Valve-sparing techniques (notably those developed by David Tirone and Yacoub) showed more satisfactory postoperative results, with lower in-hospital mortality, lower late mortality and fewer bleeding complications, when compared to the traditional technique with implantation of a valved tube (Bentall-De Bono). The advantage of the Tirone David technique is a lower long-term rate of aortic valve insufficiency compared to the Yacoub technique.

Conclusion: The “root replacement” technique for repairing aortic root aneurysms proved to be reproducible in our institution, with excellent postoperative evolution in the first operated patient. It is important that cardiovascular surgery services learn and perform the Tirone David technique, as this approach allows better early and late postoperative results, with the advantages of preserving the patients’ native aortic valve, when well selected.



• FT 10

Risk Prediction of 30-day Mortality after Bentall Surgery: Analysis of the Predictive Accuracies of EuroSCORE I and EuroSCORE II

Marcela da Cunha Sales, Alvaro Rosler, Gustavo Simões Ferreira, Vinicius Willy Prediger, Jonathan Fraportti do Nascimento, Fernando Antônio Lucchese

Introduction: The predominant portion of patients included in the studies that gave rise to the two European models for predicting cardiovascular surgical risk underwent revascularization surgery or valve surgery. Thus, risk prediction for aortic surgeries seems to have been compromised by the low proportion of such cases in the analyses.

Objective: To evaluate the predictive accuracy of EuroSCORE I and EuroSCORE II in patients who have undergone Bentall surgery, with or without coronary artery bypass grafting (CABG).

Methods: A prospective cohort with 93 patients who underwent Bentall surgery, isolated or associated with CABG, between January 2014 and December 2021. Patients were stratified into two groups: Group 1 (Bentall, n=2) and Group 2 (Bentall plus CABG, n=21). In all patients, 35 baseline factors, operative characteristics, and perioperative outcomes were evaluated. The primary endpoint of the study was 30-day mortality. The statistical plan included normality, descriptive, univariate, and multivariate analyses, culminating in ROC curves. The ROC curves were compared using the DeLong test. The significance level adopted was 5%.

Results: The stratified analysis of baseline characteristics showed that only ejection fraction (lowest in Group 2, $P=0.014$) showed a significant difference, along with the proportion of urgent surgeries (highest in Group 2, $P=0.049$), and the two models of EuroSCORE (both higher in Group 2, $P<0.05$). The other variables, including aortic pathology, showed no significant difference. Regarding the primary outcome, a significantly higher occurrence of deaths was observed in Group 2 (2.8% vs. 23.8%, $P=0.006$). The analysis of accuracies showed that EuroSCORE I had low predictive accuracy for isolated Bentall surgery and good accuracy for Bentall surgery plus CABG (Group 1: AUC 0.668 vs. Group 2: AUC 0.794). EuroSCORE II showed an inverse pattern, with better predictive accuracy for isolated Bentall surgery (Group 1: AUC 0.818 vs. Group 2: AUC 0.656).

Conclusion: Although the findings of this study need to be expanded, the results indicate that the most accurate risk model for isolated Bentall surgery is EuroSCORE II and that, on the other hand, the EuroSCORE I seems to be the most suitable model to estimate the risk of death in patients undergoing Bentall surgery associated with CABG.



• FT 11

Treatment of Aortic Coarctation in Adults with Intrapericardial Aorto-Aortic Extra-anatomical Bypass

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Introduction: The treatment of choice for aortic coarctation is the direct repair in childhood. However, some patients reach adulthood without diagnosis or have a recurrence of the lesion. The extra-anatomical aorto-aortic bypass could be an alternative treatment in these patients.

Objective: To describe the technique and evaluate the operative and long-term results of adult patients with aortic coarctation treated with an intrapericardial aorto-aortic extra-anatomical bypass.

Methods: A retrospective study involving adult patients with coarctation of the aorta who underwent an intrapericardial extra-anatomical bypass with a Dacron tube between 2013 and 2021 at the Guillermo Grant Benavente Hospital in Concepción, Chile (n=8). The approach was median sternotomy. Once connected to cardiopulmonary bypass, the retrocardiac aorta was exposed, and a distal end-to-side anastomosis was made using a Dacron tube. The tube's dimensions were measured, and an end-to-side anastomosis to the ascending aorta was made. The study encompassed the assessment of clinical characteristics, associated surgeries, immediate results, survival rates, and need for follow-up reoperations until March 31, 2023.

Results: The study comprised exclusively male patients with a mean age of 39.9 ± 10.8 years (range: 23-51). All individuals exhibited hypertension. Among them, four had associated aortic valve pathology and one had coronary artery disease. The operative risk calculated by EuroSCORE II was 1.65%. The tube diameters were 16 mm in two patients, 18 mm in four patients, and 20 mm in two patients. Four associated valve surgeries (2 replacements, 1 David operation and 1 Bentall operation) and one coronary surgery were performed. Pump time was 119 minutes: 157 and 82.5 minutes, with or without associated surgeries, respectively. There was no operative mortality. The average follow-up was 92.5 ± 32 months, and the entire patient cohort remains alive. One patient underwent reoperation at 118 months due to aortic stenosis and a valve replacement was performed with a biological prosthesis.

Conclusion: The extra-anatomic intrapericardial bypass is an alternative technique for the treatment of aortic coarctation in adult patients. This approach can be associated with other surgeries, and has excellent results in the short and long term.



• FT 12

Agensis of the Right Superior Vena Cava and Persistence of the Left Superior Vena Cava Associated with Complete Atrioventricular Block: A Challenging Case Report in Biventricular Pacemaker Implantation at a Referral Center

Ismael Escobar Capriata, Luis Henrique Vilarinho, Amandio Rampinelli

Objective: A case report of a patient presenting a challenging and extremely rare anatomical variation requiring permanent pacemaker implantation: persistence of left superior vena cava with agensis of right superior vena cava. The prevalence of isolated left superior vena cava in the general population ranges from 0.3% to 0.5%, and can reach up to 12% in association with other heart conditions. The combination of left superior vena cava persistence and absence of the right superior vena cava is uncertain, extremely rare, and poorly reported. Patients with such conditions are often incidentally diagnosed during cardiovascular, thoracic, or oncological surgical procedures, or routine imaging exams. Cardiovascular complications may occur, and alternative cardiovascular pacing routes, such as epicardial ventricular pacing, may be necessary.

Methods: We report the case of a 67-year-old patient with complete atrioventricular block undergoing an emergency procedure for bicameral pacemaker implantation. During the procedure, the vascular access through the left subclavian vein showed, through simultaneous fluoroscopy, an unusual and tortuous path with drainage from the left superior vena cava into the coronary sinus. Due to the difficulty in ventricular access and subsequent asystole, a transcutaneous pacemaker was required, and a contralateral approach through the right subclavian vein was chosen, providing better anatomy for right ventricular access. After ventricular lead placement, appropriate pacing was achieved, and a second approach was made for atrial lead implantation, with a comprehensive plan for vascular access study.

Results: The patient required a longer hospitalization than usual for proper evaluation with echocardiography and chest angio-CT, which confirmed the hypothesis of persistence of the left superior vena cava with direct drainage into the left atrium through the coronary sinus and absence of the right superior vena cava. A subsequent surgical approach for atrial lead implantation was performed five days after the initial procedure, through the right subclavian vein, with successful parameters confirmed by telemetry. Complications included pneumothorax due to left-side puncture during the first procedure, requiring chest tube placement with water seal drainage (removed after 48 hours). The patient remained hospitalized for 10 days with good progress. Post-discharge follow-up visits included telemetry evaluation with satisfactory stimulation parameters and appropriate radiological control.

Conclusion: Recognition of anatomical variations and the experience of the team in cardiovascular pacing device implantation are crucial for individually choosing the appropriate approach, as vascular access in such conditions can be challenging, and an increased number of complications can lead to unfavorable outcomes. Preoperative planning in these cases is mandatory, and the team's expertise in selecting the best approach produces optimal results. With an aging population and the increasing number of pacemaker implantations, sharing experiences among surgeons, electrophysiologists, and arrhythmia teams is fundamental for the success of procedures and reoperations.



• FT 13

Hospital Admissions and Deaths from Conduction Disturbances and Cardiac Arrhythmias in the State of Paraná, Brazil

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Objective: The present study has the purpose of characterizing the epidemiological profiles of hospitalizations and deaths due to conduction disorders and cardiac arrhythmias in the population of the state of Paraná, Brazil, for a period of five years. Additionally, it seeks to synthesize the main analysis in force in the state system, in order to conduct healthcare in Paraná from the perspective of diagnosis, treatment, and prognosis.

Methods: A retrospective study was carried out through a quantitative method, seeking to describe the epidemiological aspect using the platform of the Hospital Information System of the Unified Health System (SIH-SUS). Patient population data were used to calculate the parameters of the researched group from the absolute values of the inpatient population and deaths due to conduction disorder and cardiac arrhythmias in Paraná, considering factors such as color, gender, age group, and nature of care between February 2019 and February 2023.

Results: During the mentioned period, 21,227 hospitalizations occurred in the state of Paraná. Among these, 7,340 (34,57%) involved white patients and a small difference was observed between genders: 11,219 (52,85%) patients were male and 10,008 (47,14%) were female. Moreover, the largest registry of cases was in the age group of 70-79 years, with 5,590 (26,33%) hospitalizations, followed by the population between 60-69 years, with 4,616 (21,74%), that resulted in a percentage of 21,74%. However, patients aged 80 years or more also showed a significant index in this area, with 4,279 (20,15%) individuals. There was a higher computation in hospitalizations and emergency deaths, constituting 87,87% of the total (about 18,654 cases). In addition, there were 1,990 deaths, corresponding to 9,37% of the total hospitalizations. In summary, the data presented indicate a high flow of patients in the state, requiring primary care intervention from the onset of symptoms.

Conclusion: Cardiac arrhythmias are alterations during the generation and/or conduction of electrical impulses, causing changes in heart rhythm. This phenomenon presents symptoms such as palpitations, syncopal episodes, mental confusion, and chest pain. However, asymptomatic cases are not uncommon. Moreover, if not treated correctly, it can lead to cardiac arrest, heart disease, stroke, and sudden death. Considering the clinical importance of this condition, it was possible to notice that, in the state of Paraná, the profile of affected patients was male, white, aged between 70 and 79 years, and often presented with urgent clinical manifestations. Through the results, it is possible to infer that a high rate of hospitalization and deaths is associated with conduction disorders and cardiac arrhythmias. Thus, this study indicates a better direction in relation to healthcare assistance in Primary Care, with preventive measures for the characteristics of patients addressed aiming to reduce the cases of hospitalizations and deaths, in addition to health education about the clinical condition of the affected population.



• FT 14

Surgical Treatment for Ventricular Tachycardia Derived from Chronic Chagasic Cardiomyopathy

Denise Caroline Barros da Silva, Vitória Caroline Barros Cabral da Silva

Methods: A systematic literature review study, with 45 articles found and selection of 15, published in English and Portuguese, from 2006 to 2023, related to Chagas disease, its physiopathology and treatment, retrieved from databases such as BVS, MEDLINE, and SCIELO, using the descriptors “Chagas disease”, “Chagas cardiomyopathy”, “surgical treatment” and “ventricular arrhythmias”. In addition, a pathology textbook and a Brazilian epidemiological bulletin were also used in the study.

Results: Chagas disease has a great magnitude in Brazil, as it is one of the most costly parasitic diseases in the country, caused by *Trypanosoma cruzi* infection. According to the Epidemiological Bulletin of the Brazilian Ministry of Health in 2020, that year, there would be 819,351 people in the country with the indeterminate form of the disease, while 409,676 exhibited the cardiac form. The indeterminate form develops insidiously, about 10 to 20 years after the acute phase, in which infected individuals can develop the disease in target sites, such as cardiac, gastrointestinal, and neurological forms. The most important clinical expression of Chagas disease is the cardiac form, the result of aggressions to the cardiac tissue, greater susceptibility to thromboembolic events, rhythm disturbances, or sudden death, with emphasis in this work on the conduction impairment triggered by the protozoan. In this context, degenerative switches in the cardiac conduction system lead to sinus dysfunction and distinct atrioventricular blocks, mainly in the inferobasal and posterolateral regions, favoring the appearance of reentrant circuits and the development of malignant ventricular tachyarrhythmias, culminating in challenging outcomes for these patients. Ventricular tachycardia is the most feared arrhythmia, characterized by the presence of three or more consecutive ventricular beats, with a rate above 100 bpm and QRS complexes lasting >0.12 s. Pharmacological treatment, through the use of amiodarone, propafenone, sotalol, and beta-blockers, constitutes the fundamental basis although there are other surgical approaches as alternatives for refractory patients, associated with the use of drugs and anticoagulants to prevent thromboembolic events. Based on the articles analyzed, it was possible to verify that chronic parasite activity often induces electrical alterations in the heart, which denotes the importance of surgical treatments such as surgical resection, antitachycardia pacemaker implantation, and the utilization of implantable cardioverter-defibrillators (ICDs) and catheter ablation. Among these approaches, ICDs and catheter ablation are modern methods, used in an attempt to reverse the condition through electrical shocks and signals to correct the change in heart rhythm or remove abnormal tissue electrical pathways.

Conclusion: The most used surgical treatments for patients with Chagas cardiomyopathy refractory to pharmacological treatments are the ICDs and surgical/catheter ablation, with a reduction in the risk of sudden death and heart failure. A limitation of the study is the lack of full knowledge of the level of functioning of the mentioned techniques. Furthermore, WHO considers Chagas disease a neglected tropical disease, which emphasizes the importance of more tests, control of transmission and expanding access to existing treatments for chagasic patients diagnosed with the chronic form.



• FT 15

Cannulation Strategies for Cardiopulmonary Bypass in Patients with High-Risk Thoracotomy: A Retrospective Observational Cohort

Ricardo Kazunori Katayose, Rogerio Petrassi Ferreira, Januario Manuel de Souza

Objective: To examine the potential impact of distinct cannulation approaches for cardiopulmonary bypass on hospital mortality rates in high-risk thoracotomy patients undergoing cardiovascular surgery.

Methods: Adult patients undergoing high-risk thoracotomy for cardiovascular surgery, either elective or emergency, between 2013 and 2018, and submitted to cannulation for cardiopulmonary bypass, were enrolled. Clinical and surgical data of patients were collected from a historical database. Fisher's exact test was performed to evaluate associations between categorical data. Numerical data were analyzed by One-way ANOVA with Holm-Sidak post hoc multiple comparison test. To identify the univariate and multivariate predictors of mortality, logistic regression was performed.

Results: A total of 380 patients were included. The most cannulation strategies used were venous drainage in the right atrium with the arterial line in the brachiocephalic trunk (20.5% of all surgeries), carotid artery and jugular vein (11.3%), aortic arch and right atrium (10.5%), femoral artery and drainage from two different sites (9.5%), and femoral artery and femoral vein (8.7%). The more prevalent criteria for surgery indication included the combination of aortic surgery and valvopathy (26.3%), aortic surgery alone (19.5%), reoperation alone (12.6%), the combination of reoperation and valvopathy (10.0%), and combination of reoperation and aortic surgery (5.3%). When compared to the most central cannulation approach (aortic arch and right atrium), the use of brachiocephalic trunk and right atrium, brachiocephalic trunk and superior vena cava, carotid artery and jugular vein, or femoral artery and drainage from two different sites were a protective factor for circulatory arrest ($P < 0.05$). Cardiopulmonary bypass and cross-clamp times were significantly longer in the group using carotid artery and jugular vein ($P < 0.0001$). Patients subjected to jugular vein and carotid artery cannulation showed an increased time under cerebral hypoperfusion compared to those in which the arterial cannula was located in the brachiocephalic trunk ($P < 0.0001$). Overall mortality rate was 13.2%, varying from 3.7% (brachiocephalic trunk and superior vena cava) to 32.6% (carotid artery and jugular vein) among the different cannulation approaches. When comparing all the main strategies to the most central cannulation approach (right atrium with aortic arch), only jugular/carotid cannulation represented a risk factor for mortality, with a relative risk of 1.33 (95% CI 1.06-1.68, $P = 0.0165$). After multivariate logistic regression analysis, however, the resulting independent predictor factors for mortality were only the surgical indication, more precisely reoperation with valvopathy (OR=5.92, 95% CI 1.36-25.71, $P = 0.018$) or other indications of reoperation (OR=4.51, 95% CI 1.23-16.51, $P = 0.023$), and the duration of cardiopulmonary bypass (OR=1.01, 95% CI 1.01-1.02, $P < 0.001$).

Conclusion: We demonstrated for the first time that several different cannulation approaches could be used to handle patients with high-risk thoracotomy and that the choice of the cannulation strategy, if well indicated, does not directly interfere with mortality rates. In fact, the only factors found to be independently correlated with mortality were the criteria for surgery indication, with reoperation being the worst prognosis, and the duration of cardiopulmonary bypass time.



• FT 16

Comparative Analysis of Quality of Life in Patients Undergoing Coronary Artery Bypass Grafting and Ventricular Dysfunction: One-Year Follow-Up

Adnaldo da Silveira Maia, Lucas Maia, Matheus Maia, Francisco Victor Alves da Silva, Karlos Jennysson Sousa Soares, Iuri Betuel Gomes Antônio, Pedro Esteban Ulloa Alvarado, Oscar Harold Torrico Lizarraga, Antonio Agostinho Moura Filho, Magaly Arrais dos Santos

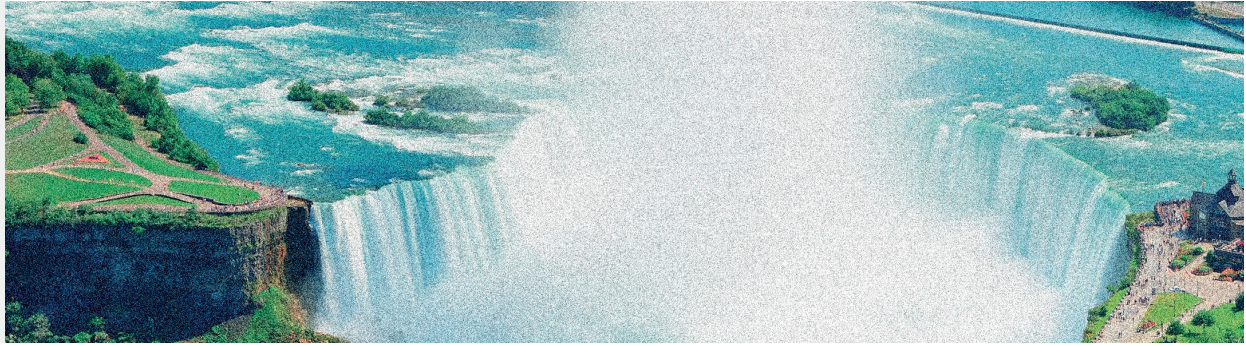
Introduction: Preoperative ventricular dysfunction (LVD) is a well-known risk factor after coronary artery bypass grafting (CABG). Different studies have analyzed the impact of the surgical approach, as well as its benefits in this group of patients. In this context, the concept of quality of life has multiple definitions in the literature, and its understanding in patients with coronary artery disease is fundamental.

Objective: The aim of the study is to evaluate the quality of life in patients who underwent isolated CABG comparing those with and without ventricular dysfunction.

Methods: Patients undergoing isolated on-pump CABG between July 2016 and July 2017 were enrolled and separated in two groups based on their left ventricular ejection fraction (EF): EF <50% AND EF >50%. The quality of life was analyzed using the Quality of Life in Cardiovascular Surgery questionnaire (QLCS score) at 1, 6, and 12 months of follow-up.

Results: A total of 406 patients were included. The mean age was 63 years, with a prevailing male population, 71% ($P=0.005$). Comorbidities were systemic arterial hypertension (85%, $P=0.7$), dyslipidemia (61%, $P=0.2$) and diabetes mellitus (54%, $P>0.9$). The surgical variables were analyzed, including EuroSCORE ($P<0.001$), cardiopulmonary bypass time ($P=0.037$), use of an intra-aortic balloon pump ($P=0.083$), and a 1-year mortality of 13% ($P=0.044$) was observed in patients with ventricular dysfunction. When assessing the quality of life at 1-year follow-up, there was no statistical difference between patients with and without ventricular dysfunction ($P=0.40$). However, in the subgroup of female patients, we observed a difference in quality of life at 30 days ($P<0.0001$).

Conclusion: There was no difference in the quality of life between patients with and without ventricular dysfunction after CABG, in 1 year of follow-up. Nevertheless, a statistically significant difference mortality rates was observed at the 1-year follow-up in the subgroup of patients with ventricular dysfunction ($P=0,044$).



• FT 17

The Influence of Cardiopulmonary Bypass Time on the Need for Blood Transfusion in Cardiovascular Surgeries

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Introduction: Cardiopulmonary bypass (CPB) is a routine procedure in cardiovascular surgeries. Its use has been associated with complications, such as increased bleeding and greater postoperative morbidity. Approximately 10% of patients undergoing cardiovascular surgery using CPB will experience severe bleeding requiring blood transfusion. Proposed mechanisms contributing to this phenomenon include hemodilution, surgical blood loss, destruction of tissue factors related to the intrinsic coagulation system, and residual anticoagulation from heparin used during CPB.

Objective: This study aimed to evaluate the correlation between increased CPB time and the greater need for blood transfusion in patients undergoing major cardiovascular surgeries at a single center in Brazil.

Methods: A clinical retrospective study was conducted using a database from a Brazilian referral center composed of patients operated on between November 2019 and September 2021. The restrictive strategy guided by bedside hemodynamic and gasometrical parameters is the standard criterion for blood transfusion in the service. This strategy aims to maintain a serum hemoglobin (Hb) level above 7 g/dL, considering other dynamic factors, such as increased bleeding, the risk to the patient's life, and macro- and/or micro-hemodynamic instability, with low perioperative oxygen supply. Statistical evaluation using the logistic regression technique was used.

Results: A total of 483 consecutive patients were analyzed, with a mean age of 56.38. Of these, 293 (60.7%) were male, 317 (65.6%) had high blood pressure, and 143 (29.6%) were diabetic. The most frequent surgery was CABG (195, 40.4%), followed by valve surgery (181, 37.5%), ascending aorta surgery (30, 6.2%), other procedures (52, 10.8%), and combined surgery (25, 5.2%). Multivariate analyses showed an odds ratio increase for the need for blood transfusion of 2% for each minute on CPB.

Conclusion: We report a single-center analysis which shows that longer time on CPB was related to increased blood transfusion, with an odds ratio increase of 2% for each minute. This is particularly important to address, as preventive measures may be indicated for cases where long CPB times are expected.



• FT 18

Analysis of the Variation in the Number of Surgeries for Correction of Cyanotic Congenital Heart Defects Before and After the COVID-19 Pandemic in all Regions of Brazil

Renata Garcez da Luz, Amanda Sarmento Corrêa, Rui M.S. Almeida

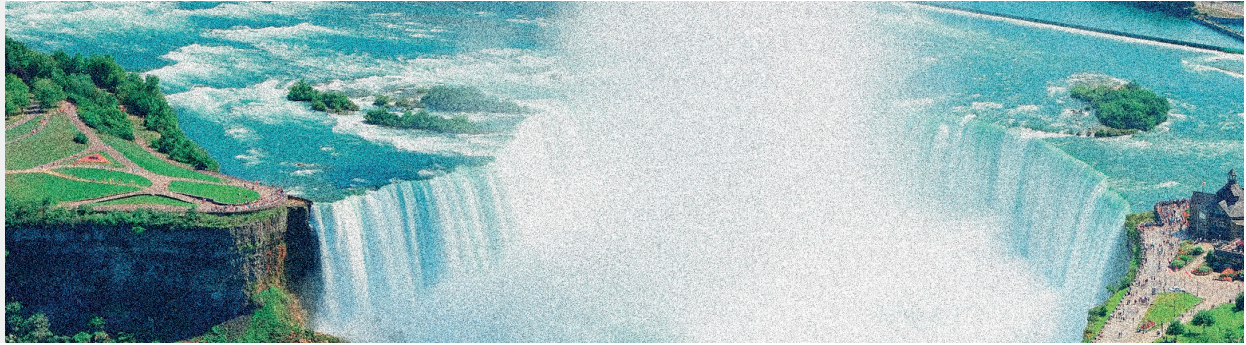
Introduction: Congenital heart diseases are structural abnormalities of the cardiovascular system and are classified into acyanotic and cyanotic, representing an important cause of mortality in the first year of life. Cyanotic congenital heart diseases are manifested by bluish skin coloration due to inadequate oxygenation or changes in blood flow, thus being the most severe form of the disease.

Objective: Evaluate whether the COVID-19 pandemic influenced the negative or positive variation in the number of cardiac surgical procedures for the correction of cyanotic congenital heart defects.

Methods: This was a retrospective cross-sectional study using public domain data from the Department of Informatics of the Brazilian Unified Health System (DATASUS). We selected data from procedures for correction of tetralogy of Fallot, transposition of the great vessels, pulmonary atresia, Ebstein anomaly, persistent truncus arteriosus, and total anomalous pulmonary venous return, during the years 2019 and 2021, representing the periods before and after the onset of the Covid-19 pandemic.

Results: In the study period, all regions of Brazil presented distinct numbers regarding surgical procedures for the correction of cyanotic heart disease, a difference that was accentuated by the Covid-19 pandemic. Despite the differences, four Brazilian regions showed a decrease in the number of surgeries for the correction of cyanotic heart diseases in the 2021, with the exception of the Northeast region that obtained an increase of 12.16% in the post-pandemic year. The region with the most significant reduction was the Southeast, with 39.82% of the cases analyzed and only 133 surgical procedures performed in 2021. The second most affected region was the Midwest, with a reduction of 22.23%, followed by the North, with a decrease of 9.62% in surgeries. The South region is characterized by having the least reduction of surgeries among the regions that presented a negative variation, with a decrease of only 9.5%. The Northeast region stands out for presenting a different pattern among the regions of Brazil. During 2021, the Northeast performed a total of 83 surgical procedures, 9 more than the year before the Covid-19 pandemic. The most affected surgical procedure was Ebstein's anomaly, with a 62.5% reduction in national cases. The cyanotic surgical procedure least impacted by Covid-19 was pulmonary atresia, which recorded a decrease of 15.79% in surgeries during the year 2021.

Conclusion: The pandemic was responsible for the decrease in surgical procedures for correction of cyanotic congenital heart disease in Brazil in 2021. Brazil registered only 355 cases of new surgeries nationwide, 22.32% less than the total number of procedures in 2019. Faced with the fear of contamination and the serious consequences of the disease, many patients did not have heart surgery during 2021. Furthermore, as a measure to prioritize the care of patients affected by Covid-19, many elective surgeries were canceled, which contributed to a significant decrease in the number of surgical procedures for the correction of cyanotic congenital heart disease in the Brazilian territory.



• FT 19

Comparative Analysis of Balloon Technique *versus* Brock Technique for Tetralogy of Fallot Repair in Neonates: A Systematic Review and Meta-Analysis

Anna Carolina Kohn Gonçalves Anti, Isabelle Nakamura Miguel, Flávia Perez da Silva, Flávia Rocha Diniz

Objective: The objective of this comprehensive systematic review and meta-analysis was to compare the effectiveness and outcomes of the balloon technique and the Brock technique for repairing tetralogy of Fallot (TOF) in neonates.

Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a rigorous search was conducted in prominent electronic databases including PubMed, Embase, and Cochrane Library to identify relevant articles published until September 2021. Specific keywords such as “Tetralogy of Fallot,” “neonates,” “balloon technique,” and “Brock technique” were utilized. Inclusion criteria involved studies directly comparing the balloon technique and the Brock technique for tetralogy of Fallot (TOF) repair in neonates. Data extraction was performed independently by two reviewers, and any discrepancies were resolved through consensus. Outcome measures of interest encompassed mortality rates, reintervention rates, and procedural complications.

Results: The meta-analysis included 10 studies, involving a total of 500 neonates who underwent TOF repair. Among them, the balloon technique was employed in 250 neonates, while the Brock technique was utilized in the remaining 250 neonates. The pooled analysis revealed a statistically significant reduction in the overall mortality rate in the balloon technique group compared to the Brock technique group ($P < 0.05$). Additionally, the balloon technique group exhibited significantly lower reintervention rates ($P < 0.05$). However, no significant difference was observed in procedural complications between the two techniques ($P > 0.05$). Subgroup analysis based on the duration of follow-up consistently indicated the superiority of the balloon technique in terms of lower mortality and reintervention rates. Sensitivity analysis, performed by excluding individual studies, confirmed the robustness and reliability of the findings.

Conclusion: This systematic review and meta-analysis support the consideration of the balloon technique as a preferred approach for repairing TOF in neonates, as it is associated with lower mortality and reintervention rates compared to the Brock technique. However, the findings also highlight the need for further large-scale studies with extended follow-up periods to validate these results and assess long-term outcomes as well as the potential complications associated with both techniques.



• FT 20 Critical Congenital Heart Disease Screening Limitations

Sthéfani Klock Thiesen, Wanessa Klock Thiesen, Matheus Cezne da Rocha, Maria, Vitória Damião

Introduction: Critical congenital heart disease (cCHD) can be defined by the need for surgical or catheter interventional therapy in the first year of life to ensure survival. The importance of early diagnosis comes mainly from the number of preventable deaths. Despite technical-scientific advances, the detection rate of critical heart defects remains inadequate. Studies indicate varying sensitivity rates for prenatal and clinical diagnoses, ranging from 51% to 60% and from <50% to 80% within the first 24 hours of life in more optimistic studies. Thus, it is possible to predict that the diagnostic gap remains around or greater than 20%, *i.e.*, there is a significant number of undiagnosed patients who would potentially be discharged from the hospital. Timely diagnosis of neonate hospitalization implies lower mortality rates from causes such as cardiogenic shock and sudden death. Additionally, it stabilizes patients and prevents target organ damage, minimizes the risks of hypoxia, acidosis, shock, and brain injury, as well as enables a better preoperative state.

Objective: This research aims to review the current possibilities, limitations, and results available regarding cCHD screening. Through this, the objective is to provoke critical reasoning for new screening proposals, enabling a progressive reduction in morbidity and mortality associated with the disease.

Methods: This study was based on qualitative research reviewing the recommendations available in the literature, including seven high-quality scientific articles on screening and early diagnosis of cCHD, mainly endorsed by the American Heart Association (AHA) and the American Academy of Pediatrics (AAP). Currently, the only method recognized for reducing the diagnostic gap is pulse oximetry, which is endorsed by the AAP and the AHA. Concisely, these institutions currently recommend the use of the saturation algorithm after the first 24 hours of life, and cut-off values <95% or a limb difference >3% as indicators for further investigation. In cases where the patient yields results below the specified threshold but the saturation remains >90%, a re-evaluation can be conducted on two separate occasions.

Results: The analysis of the included studies demonstrated an average sensitivity of 69.6%, up to 83%, alongside a positive predictive value of 47%, and a false positive rate ranging from 0.1 to 0.8%, besides a significant reduction in diagnostic gap rates from 26% to 8%, reduction in mortality from 18 to 8%, and reduction in preoperative morbidity.

Conclusion: The association between pulse oximetry and clinical examination proved to be an effective tool for early diagnosis of the studied disease. However, the use of this tool is limited by a series of technical factors, and the method has not shown satisfactory sensitivity in obstructive diseases of the left heart, coarctation, and aortic stenosis. Because there are several cut-off values and screening protocols, disparities in geographical altitudes, and different oximeter devices, the studies are conflicting regarding the results; however, any associated reduction in morbidity and mortality is welcome. More extensive studies and new diagnostic strategies are needed promptly.



• FT 21

Impact of COVID-19 on the Number of Cardiac Surgeries for Acyanotic Congenital Heart Disease: Epidemiological Analysis

Amanda Sarmiento Corrêa, Rui M. S. Almeida, Renata Garcez da Luz

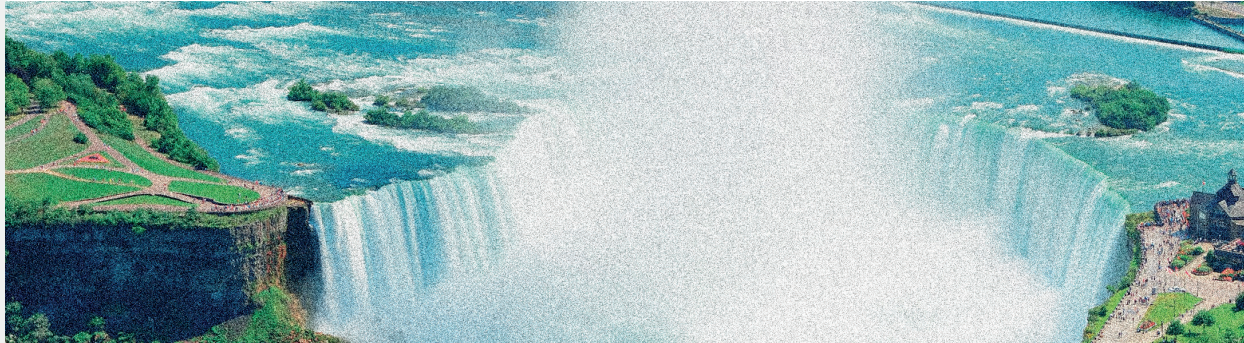
Introduction: Congenital heart diseases are characterized by the abnormal development of cardiovascular constituents during the embryological period. The abnormal morphology of these structures leads to irregular functioning of the blood flow, promoting systemic repercussions for the affected individuals. In this sense, they are divided into cyanotic and acyanotic congenital heart diseases.

Objective: To analyze the influence of the COVID-19 pandemic on the number of cardiac surgeries for acyanotic congenital heart defects with left-to-right pulmonary flow.

Methods: Retrospective epidemiological study based on the public platform of the Department of Informatics of the Unified Health System on the absolute numbers of surgeries for atrial and interventricular communication, patent ductus arteriosus, aortopulmonary window, and interatrial communication, in two periods: pre-pandemic (from April 2018 to March 2020), and post-pandemic (from April 2020 to March 2022).

Results: Table 1 shows the absolute values of cardiac surgeries performed for acyanotic congenital heart diseases with left-to-right pulmonary flow before and after the pandemic in all regions of Brazil. It is observed that before the pandemic, 5,808 interventions were performed. However, during the pandemic, there was a 30.21% reduction in the number of surgeries. Moreover, all regions presented reductions in their procedures during the pandemic when compared to the pre-pandemic period, demonstrating the negative impact of COVID-19. The Southeast region showed the most significant reduction, with 840 fewer procedures in the post-pandemic period. The Northern region had the smallest variation in this period, with 30 fewer procedures. Table 2 shows the absolute numbers of each procedure performed for acyanotic congenital heart disease and left-right pulmonary flow before and during the pandemic. Corrections of atrial septal defects represented the majority of procedures in the analyzed periods. Nonetheless, the most significant reduction occurred in surgeries for correction of aortopulmonary window, declining by 26.83% after the pandemic, and surgeries for correction of patent ductus arteriosus showed the smallest reduction, with a decrease of 12.16% in this period.

Conclusion: The study results revealed the negative repercussions of the COVID-19 pandemic in the number of cardiac surgeries across all regions of Brazil. Prior to the pandemic, the total count of interventions stood at 5,808 and, which subsequently decreased to 4,053 surgeries in the post-pandemic era. Moreover, among the regions of Brazil, the Southeast was the region that presented the most significant reduction, with 34.31% fewer surgeries during the pandemic. In this period, the least affected region had a reduction of 10.94% in interventions. Regarding the procedures, the most significant reduction was observed in the correction of aortopulmonary window, and the surgery for correction of patent ductus arteriosus suffered the most negligible impact, with a reduction of 12.16%. Thus, the emergency measures implemented during the pandemic had a significant impact on surgical procedures, which had to be canceled or postponed.



• FT 22

Proposal of a Surgical Planning for Fontan Based on Numerical Studies and Three-Dimensional Hemodynamics

Carlos Junior Toshiyuki Karigyo, Alexandre Noboru Murakami, Paulo Cesar Duarte Junior

Objective: The general objective was to compare, through computer simulation, the hemodynamic behavior of blood flow, such as velocity, pressure, and tensions in the post-anastomosis region between the pulmonary artery and the inferior vena cava, developed in the Fontan surgery. Specific objectives were: (a) to identify and evaluate the significance of differences in the results obtained from simulations using realistic boundary conditions (non-Newtonian fluid, turbulence, transient regime and flexible vascular wall) compared to simplified conditions (Newtonian fluid, laminar flow, steady state and rigid vascular wall); (b) to propose a simplified method for the elaboration of numerical simulations for the Fontan surgical planning, based on the obtained results between realistic and simplified simulations.

Methods: The softwares Ansys®, InVesalius®, Autodesk® and WebPlotterDigitalizer® were employed to carry out the simulations. Total cavopulmonary connection geometries and boundary conditions were obtained from the combination of magnetic resonance and angiotomography imaging of three Fontan patients (X, A and B). Patient X's magnetic resonance images were used for extracting surface geometries and mesh generation. In combination with boundary conditions, eight simulations were performed from patient A's anatomy, using progressively increasing complexity in the parameters. Firstly, the models runned with rigid vessels, steady-state regime, laminar flow, and Newtonian fluid for the patient in rest. Afterwards, the type of fluid was changed to non-Newtonian to nourish with given the weight of this modification. Then it was changed from laminar flow to turbulent. Subsequently, the permanent regime was changed from converted to transient, considering the pulsatile flow of each vena cava. This flow was adapted considering the effects of breathing in the inferior vena cava. Surgical planning for Fontan operation was performed from patient B's anatomy, considering three parameters to optimize final geometry: blood flow distribution between left and right lungs, inferior vena cava wall shear stress, and energy loss through the geometries.

Results: Two simplified but robust configurations were obtained: (1) Newtonian fluid, turbulent flow, steady-state, and rigid walls; and (2): Newtonian fluid, turbulent flow, transient flow, and rigid walls. The first considers a constant flow during respiratory cycle, and the second, more complex, illustrates the flow variations and their effects during the respiratory cycle. Finally, a complete Fontan surgical planning was presented, using both proposed configurations, indicating not only the positions of the cavopulmonary anastomosis but also the effects of surgical enlargement of the left pulmonary artery stenosis. Tutorials were also generated to disseminate the created technique.

Conclusion: Fontan's surgical planning, through numerical methods, emerges as a valuable tool to help surgeons to obtain early models with the immediate hemodynamic results in a safe and reliable way. The comparison between several boundary conditions and, finally, the identification of the most simplistic method, facilitating the expansion of this technique to medical centers, is unprecedented. By changing geometries, angles of attack, flows and others, testing the behavior of the modified region in a computational way is possible, and this work shows how, comparing boundary conditions and discussing alternatives.



• FT 23

Regional Access to Healthcare for Congenital Cardiac Diseases in Brazil

Ana Carolina Toguchi, Kawanna Izabella Buzzo Feitosa, Fernanda Ferreira Fernandes, Julia Rodrigues Costa

Introduction: Congenital heart defects encompass structural abnormalities in the heart or major blood vessels that are present from birth, constituting the most prevalent congenital disorder, affecting approximately 1% of newborns. In this context, delayed diagnosis and treatment, particularly surgical repairment, can result in irreversible heart damage, exacerbate symptoms, and contribute to increased mortality rates among affected children.

Objective: This study aimed to assess healthcare data related to congenital heart defects in Brazil by examining the provision of medical assistance and mortality rates, with a particular focus on identifying regional disparities in healthcare access across the country's five geographical regions.

Methods: We conducted a cross-sectional study utilizing the Brazilian data science platform known as PCDaS, specifically designed for health research and provided by the Oswaldo Cruz Foundation (FioCruz). To analyze the economic aspects, we utilized the gross domestic product (GDP) data for the year 2020, obtained from the Brazilian Institute of Geography and Statistics (IBGE). We collected comprehensive data on hospitalizations related to congenital heart defects (CID Q20-Q29) from 2008 to 2021, as well as data for the year 2020, specifically focusing on the region, state, and capital city. The data encompassed both the location of medical care and the patients' residency. Additionally, data on mortality rates for the year 2020 were extracted from the PCDaS platform. All collected data were meticulously tabulated and analyzed using Microsoft Excel. To calculate mortality rates, we aggregated the number of deaths from each state according to its respective region. To determine migration patterns, we subtracted healthcare assistance data from residence data to identify individuals seeking medical care in different locations. Therefore, numbers were turned into percentages.

Results: Our findings revealed a slight association between regional GDP and mortality rates, with regions characterized by lower GDP exhibiting higher mortality rates. Specifically, the Midwest region displayed a mortality rate of 20.8% and ranked 4th in terms of GDP, while the Northeast region exhibited a mortality rate of 17.1% and ranked 3rd in GDP. Similarly, the North region showed a mortality rate of 14.6% and ranked 5th in GDP. In contrast, the Southeast and South regions had comparable mortality rates, both at 11.8% and 11.9%, respectively. Notably, the Southeast region accounted for the highest percentage of hospitalizations (47%) and had a significant population size. Regarding migration patterns for seeking medical assistance, our analysis revealed that 2.8% of individuals who received healthcare assistance migrated to access services in different regions. Among those who migrated, the Southeast region attracted the largest share, receiving 40.7% of these migrants, while the North region had the highest rate of outbound migration, with 42.2% of individuals seeking assistance relocating to other regions.

Conclusion: The surgical correction of congenital heart disease in Brazilian patients has unveiled a significant regional disparity in healthcare resources, resulting in potential barriers to accessing treatment. The substantial regional economic deficit in healthcare underscores the urgent need for public policies aimed at ensuring equitable access to surgical treatment across all regions of the country.



• FT 24

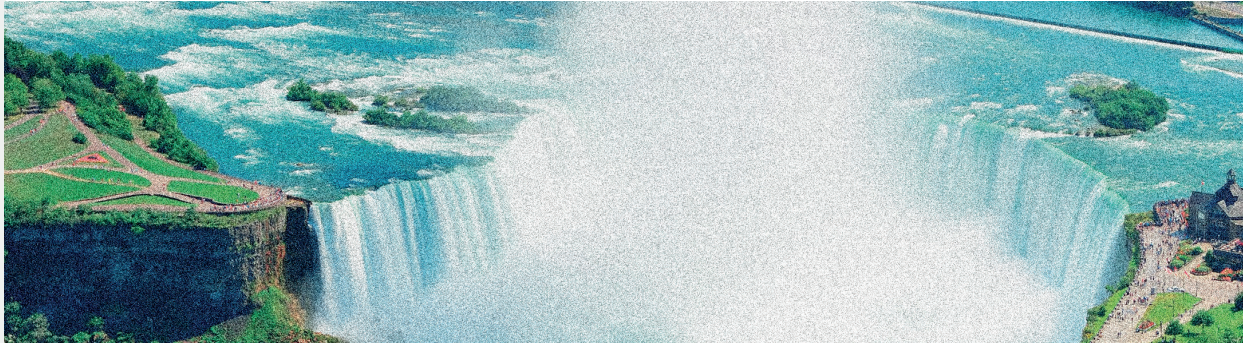
Surgical Correction of Complex Ascending Aortic Aneurysm and Descending Aortic Coarctation with Extra-anatomic Bypass: 9 Years of Evolution

Ricardo Katayose, Januario Manuel de Souza, Rogerio Petrassi Ferreira

Introduction: Aortic coarctation is the narrowing of the descending aorta and one of the most common congenital heart diseases. It may present in isolation or associated to other cardiac anomalies, being the bicuspid aortic valve or bivalve defects the most frequently associated. The clinical evolution of the aortic coarctation without surgical treatment influences chances of survival, besides contributing to the development of difficult-to-control arterial hypertension, heart failure, aortic dissection, infective endocarditis, and cerebral aneurysm rupture. The pathology clinical presentation depends on anatomical factors, degree of obstruction, and associated lesions observed in clinical evaluation. It spans from newborns experiencing shock in their first weeks of life to asymptomatic adolescents and adults with systemic arterial hypertension and heart murmurs.

Objective: To report the positive evolution of a patient submitted to ascending aortic aneurysm and aorta coarctation repair nine years after the procedure.

Case Report: A 54-year-old male, with a history of type A aortic dissection at 37 years of age, underwent surgical correction with a straight Hemashield tube in the ascending aorta, preserving the aortic root and aortic valve. In the clinical evolution, an aortic root aneurysm (65 mm) was associated with mild aortic insufficiency and aortic coarctation was identified after the left subclavian artery. In 2014, at the age of 43, the patient underwent another surgery to reconstruct the aortic root with a mechanical valve tube, and concomitantly we corrected the coarctation through an ascending-to-descending aorta bypass with extra-anatomic Dacron graft (posterior pericardiotomy). The right carotid artery and right jugular vein were used for the cardiopulmonary bypass (CPB) installation due to the high risk of aortic rupture and the presence of adhesions from previous surgery. The patient remained asymptomatic in the evolution of the cardiology follow-up. In 2023, a control aortic angiotomography was conducted, with positive results after nine years of surgery.



• FT 25

Taking Risk to Avoid a Bigger One: Electrophysiology Study in a Post-Fontan Surgery Patient with Bradycardia

Giulia Bonatto Reichert, Thais Nicola, Bruna Miers May, Karina de Andrade, Ricardo de Medeiros Pianta, Adriano Nunes Kochi, Eduardo Bartholomay de Oliveira

Objective: To review the management of a patient in the late postoperative period following Fontan surgery, who was referred for pacemaker implantation due to total atrioventricular block (TAVB) identified during routine examination.

Methods: The authors present a case description along with a literature review.

Case Report: A 16-year-old female patient with a history of right ventricular hypoplasia and tricuspid atresia, who underwent bidirectional Glenn surgery (anastomosis of the superior vena cava in a branch of the right pulmonary artery) and extracardiac Fontan surgery (anastomosis between the inferior vena cava and a branch of the pulmonary artery right through a tubular Dacron graft) in childhood. During an echocardiogram, the patient had bradycardia (no record), referred as total atrioventricular block. This prompted further investigation, including an electrophysiology study for additional evaluation, after serial Holter demonstrated junctional rhythm and sleep pauses of up to 2.5 seconds. The examination was performed through the right femoral artery and introduction of a decapolar electrophysiological study catheter through a retrograde aortic access in the left heart chambers. The His bundle potential was mapped around the atrioventricular ring on the left side, and basic electrophysiology study was then performed using standard atrial pacing and extrastimulation, showing normal intracardiac intervals and sinus node recovery time, even after isoproterenol infusion. A type 2 sinoatrial block was also identified during the exam. The patient was discharged from the hospital on the same day and remained asymptomatic during a 6-month follow-up period.

Conclusion: Advances in surgical and percutaneous techniques have led to a significant increase in the number of adults living with complex congenital heart disease. Patients who have undergone Fontan surgery have an increased risk of cardiac arrhythmias. Adequate evaluation, performed invasively, can prevent unnecessary major interventions.



• FT 26

Tetralogy of Fallot in the Neonate: Pre- and Postnatal Management of the Blue Baby Syndrome

Louise Etienne Hoss, Maycon Gabriel Duarte Teixeira, Cinthia Sousa Daumichen, João Miguel Vilar Saito, Diogo Paterno Bertollo, Eros Guedes Bucker

Introduction: Tetralogy of Fallot is a prevalent cyanotic congenital heart defect, comprising four simultaneous cardiac anomalies. Research has shown progress in both disease identification and surgical interventions, leading to substantial improvements in the quality of life for affected individuals.

Objective: The aim of this study is to review the trends in prenatal diagnosis and treatment. The researched hypotheses suggest that a multidisciplinary intervention contributes to successful clinical outcomes in individuals with this syndrome.

Methods: A literature review was conducted using scientific databases, including PubMed, Scopus, and Web of Science. The following MeSH terms were utilized: "Tetralogy of Fallot", "Cyanosis", "Surgery", and "Congenital Heart Disease." Studies addressing the disease history and aspects such as cardiovascular anatomy, pathophysiology, signs, and symptoms were included.

Results: The blue baby syndrome is characterized by four distinct but concomitant anatomical changes: ventricular septal defect, overriding aorta, pulmonary stenosis, and right ventricular hypertrophy. The initial clinical presentation of the syndrome depends on the degree of obstruction of pulmonary blood flow. Nonetheless, the disease hinders the child's development and growth. Prenatal diagnosis of tetralogy of Fallot contributes to reducing neonatal morbidity and mortality from congenital heart disease, in addition to facilitating secondary prevention in two different ways: parental counseling regarding diagnosis, prognosis, management, and treatment of the disease, and the implementation of neonatal and obstetric measures, as well as early intervention to improve pathological outcomes. Fetal echocardiography is used for detailed diagnosis and evaluation of all fetal cardiovascular pathologies. It should be performed between 18 and 22 weeks in pregnancies with high risk of congenital heart disease. Regarding treatment, measures for rapid relief include oxygen, morphine, and beta-blockers to increase blood flow to the body. If not surgically corrected in early childhood, tetralogy of Fallot is potentially fatal, with low survival rates. Surgical correction aims to close the ventricular septal defect, preserve the morphology and function of the right ventricle, associated with an intact pulmonary valve, optimizing pulmonary blood flow. After the procedure, the right ventricular wall returns to its normal thickness, blood oxygen levels increase, and symptoms decrease. Clinical management and patient recovery require a joint planning of care provided by the healthcare team.

Conclusion: Early diagnosis of tetralogy of Fallot is crucial in a newborn's life, not only for alleviating but also preventing disease complications. Despite the availability of relief measures, the most effective treatment is surgical, through intracardiac repair. The good clinical outcomes for these patients depend not only on theoretical and practical expertise but also on communication between different specialties.



• FT 27

Transconal Septal Repair for Anomalous Aortic Origin of Coronary Artery in LATAM: Two Case Reports

Pablo Ebensperger, Juan Contreras, Marcelo Godoy

Introduction: The anomalous aortic origin of a coronary artery (AAOCA) from a wrong sinus of Valsalva is an uncommon form of congenital heart defect that has been associated with symptoms of myocardial ischemia and sudden death. There are multiple subtypes of AAOCA, including the anomalous aortic origin of a left coronary artery (AAOLCA) arising from the right coronary sinus and the origin of the left anterior descending (LAD) artery from the right coronary ostium. These variations address a surgical challenge. In 2019, Hani developed a novel transconal approach with an effective unroofing of the anomalous coronary artery and separating it from the compressive effects of the muscular right ventricular outflow tract (RVOT). Herein we present the first two cases managed using this technique in South America.

Case Report: The first case is a 45-year-old male who presented with typical chest pain for 6 months, with multiple visits to the Emergency Room. The second case is a 61-year-old male admitted after a syncopal event. While the electrocardiogram displayed no alterations, elevated levels of cardiac enzymes were observed. Both cases were studied with coronary angiography and CT angiography that revealed AAOLCA arising from the right sinus and anomalous origin of the left anterior descending (LAD) artery from the right sinus, respectively. Elective surgery was performed in both cases using the novel approach of transconal unroofing of the anomalous coronary artery with pericardium patch to reconstruct the RVOT, avoiding any compression of the coronary artery. Both patients had an unremarkable recovery and were discharged on postoperative days 8 and 6, respectively.

Discussion: The ideal repair for these patients is controversial. Coronary artery bypass grafting (CABG) is the most common technique but has its limitations in long-term outcomes. We have described the application of a novel transconal technique described by Hani, to treat a rare variant of AAOLCA and anomalous origin of the LAD artery in symptomatic patients at a referral center in the southern region of Chile. We believe this technique offers the best anatomical and functional repair, relieving the symptoms arising from septal compression and interarterial course and providing an unobstructed coronary flow.



• FT 28

Two-Stage Treatment of Bicuspid Valve Aortopathy Associated with Complex Aorta Coarctation: Hybrid Resolution in an Adult Patient

Busnelli Guido Luis, Estrada Ronald, Gallardo Emanuel, Posatini Ricardo, Chas Jose, Kotowicz Vadim

Introduction: Coarctation of the aorta (CoA) in adulthood often presents alongside other cardiovascular diseases that require a complex intervention. Among these cases, bicuspid aortic valve (BAV) is prevalent, occurring in 50%- 60% of patients with coarctation. This valve aortopathy is associated with aortic dilation and other complications that contribute to a bad prognosis. The ideal approach for such patients is uncertain, and different surgical strategies have been described. The hybrid treatment with an endovascular approach is a promising strategy for managing these complex cases.

Methods: We present the case of a 51-year-old male patient with a history of arterial hypertension, admitted to our center with congestive heart failure and associated severe aortic insufficiency. The patient also exhibited dilation of the ascending aorta (55 mm) and a critical narrowing of the aortic diameter distal to the left subclavian artery, consistent with CoA. On examination, blood pressure was 190/100 in the upper limbs and 90/60 in the lower limbs. In addition, the infrapatellar pulses were absent. Laboratory results revealed chronic renal failure with a creatinine level of 1.4 mg/dl. Magnetic resonance imaging showed preserved function, with an important ventricular dilation and hypertrophy, and the presence of collateral circulation.

Results: We performed a two-stage treatment approach: a) first endovascular stage, with the resolution of CoA by angioplasty and the placement of a covered stent. This procedure resulted in a residual gradient of 15 mmHg; b) second surgical approach, conducted 7 days later, through a median sternotomy, during which a Bentall-de Bono mechanical valve size 25 was implanted. The postoperative period was uneventful, and the patient was discharged 7 days after surgery. Renal function improved to a creatinine level of 0.7 mg/dl and a decrease in blood pressure in the upper limbs (110/60 mmHg) was observed.

Conclusion: The association between BAV and CoA is not uncommon. Combined advanced surgical resolution of these two entities in an adult patient has high preoperative morbidity. The hybrid resolution of this complex pathology in two stages avoided hemorrhagic complications, refractory systemic arterial hypertension, and renal hypoperfusion. Hybrid treatment is presented as a feasible alternative, with good short-term results in this patient population.



• FT 29

A Case Series of Anomalous Aortic Origin of Coronary Artery in a Cardiac Surgery Reference Center in Latin America

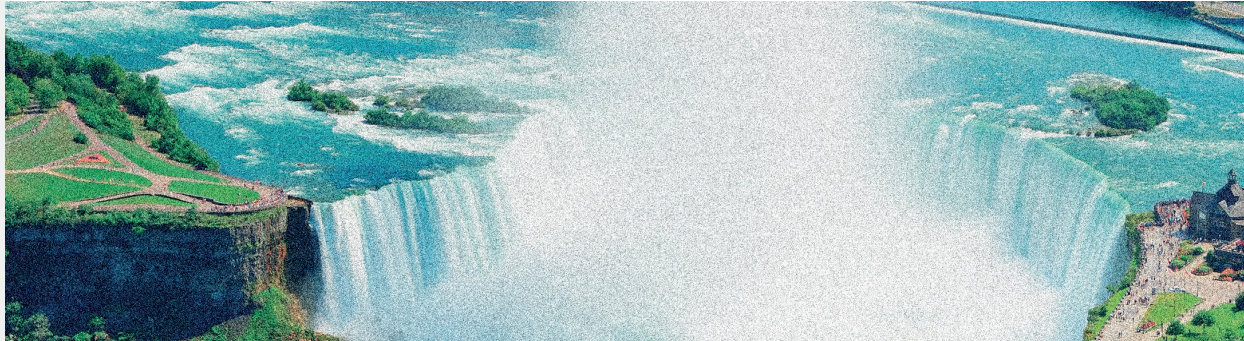
Paulo Eduardo Meneguzzo, Fernando Wohlfeil, Rafael de Oliveira Ceron, Felipe Borsu de Salles, Cristiano Blaya Martins, Renato Abdala Karam Kalil

Objective: Report surgical management in a case series of anomalous aortic origin of coronary artery (AAOCA) treated at a cardiac surgery reference center in Latin America.

Methods: The authors present a case series of four patients submitted to revascularization and commentary based on literature review.

Results: Between September 2018 and May 2023, a total of three patients with anomalous right coronary artery (ARCA) originating from the left sinus of Valsalva underwent coronary artery bypass grafting (CABG) surgery using the right internal thoracic artery and one patient with anomalous left coronary artery (ALCA) originating from the right sinus of Valsalva treated with CABG using the left internal thoracic artery. Among patients in the ARCA group, the first patient was a 30-year-old man without previous family history of cardiovascular disease who had an acute ST-elevation myocardial infarction. The second patient was a 76-year-old man with effort angina and the third was a 13-year-old male patient who suffered exercise-related sudden cardiac arrest. The patient in ALCA group was a 61-year-old woman with acute coronary syndrome. The diagnosis of anomalous coronary artery in all cases was made with coronary angiography and confirmed by computed tomography angiography. All patients underwent CABG under cardiopulmonary bypass (CPB), without complications. Mean cross-clamp and CPB times were 23 minutes and 32 minutes, respectively. The internal thoracic artery graft was preferred, instead of relocating or unroofing coronary ostia. Native coronary artery ligation was not performed. All patients had uneventful postoperative course, and returned to their activities without experiencing angina or any limitations, with an average follow-up of 3 years.

Conclusion: AAOCA is a rare congenital anomaly. Surgical techniques remain controversial and challenging, occasionally with unpredictable results. The individualization of surgical management is essential to provide the most appropriate therapy for each case. Internal thoracic artery grafts presents advantages of being a widely adopted technique, familiar to all surgeons and with predictable long-term results.



• FT 30

Association of Liver Dysfunction with Outcomes after Percutaneous Coronary Intervention: A Systematic Review and Meta-Analysis

Tulio Caldonazo, Hristo Kirov, Panagiotis Tasoudis, Marcus Franz, Markus Richter, Alexander Yipprich, Ahmad Shanahah, Diyar Haji, Torsten Doenst

Objective: Liver dysfunction is a known risk factor in the cardiovascular field. It specifically increases perioperative risk in patients undergoing coronary bypass surgery. Since percutaneous coronary intervention (PCI) is the much less invasive procedure for the treatment of coronary artery disease, we aimed to assess the relationship of liver dysfunction with outcomes in patients undergoing PCI.

Methods: Three databases were searched (MEDLINE, Web of Science, and The Cochrane Library). We performed a meta-analysis of all studies in patients who underwent PCI that provided information on the presence or absence of liver dysfunction. Primary outcome was short-term mortality, while secondary outcomes were major adverse cardiovascular events (MACE), bleeding and acute kidney injury. Random-effects model was applied.

Results: Five studies were selected and the data from 10,710,317 patients were included in the final analysis. In comparison with the absence of liver dysfunction, patients with liver dysfunction were associated with higher short-term mortality (OR 2.97, 95% CI 1.23-7.18, $P=0.02$), higher MACE (OR 1.42, 95% CI 1.08-1.87, $P=0.01$), and higher bleeding (OR 2.23, 95% CI 1.65-3.00, $P<0.01$). There was no significant difference regarding acute kidney injury (OR 1.20, 95% CI 0.50-2.87, $P=0.69$).

Conclusion: The analysis suggests that liver dysfunction in patients undergoing PCI is independently associated with a higher risk of short-term mortality and increased occurrence of MACE and bleeding. However, there appears to be no association with acute kidney injury.



• FT 31

Atrial Fibrillation after Coronary Surgery with Cardiopulmonary Bypass: Incidence and Predictors

Juan Montero, Federica Venturino, Carolina Sosa, Santiago Cubas, Sofia Rodriguez, Carlos Gonzalez, Victor Dayan, Daniel Brusich, Pablo Straneo

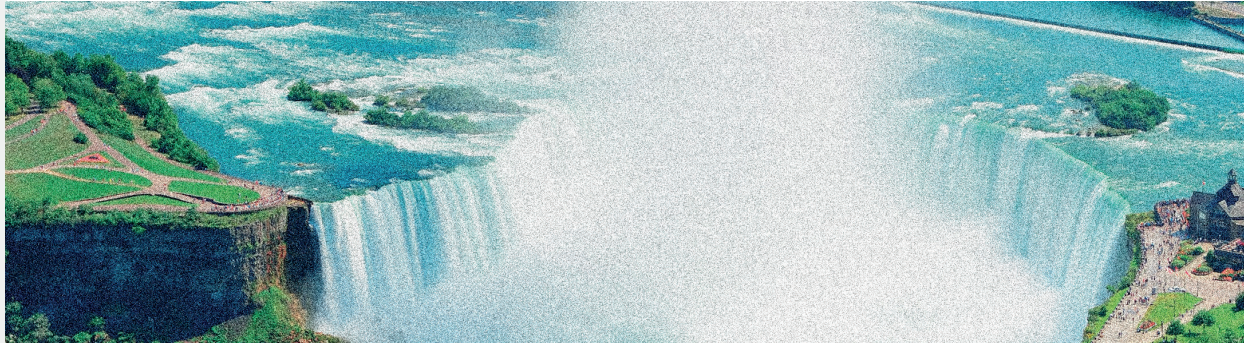
Introduction: Postoperative atrial fibrillation (POAF) is the most common cardiac arrhythmia that occurs after coronary artery bypass grafting (CABG), affecting approximately 25-40% of patients. Arrhythmia leads to prolonged hospitalization and may have an impact on both short- and long-term prognoses. Underlying mechanisms are multifactorial and include intraoperative and postoperative factors. These make it difficult to select an effective prophylaxis and to decide which patients may benefit from it.

Objective: The aim of this study was to evaluate POAF incidence in CABG patients who underwent cardiopulmonary bypass (CPB) and to identify its predictive factors.

Methods: An observational and analytical cohort study in which study population were adults who underwent CABG with CPB in 2022 at Hospital de Clínicas in Uruguay. Exclusion criteria was previous atrial fibrillation. Clinical data were obtained from medical records. We used the Mantel-Haenszel test to calculate the odds ratio. A statistical significance threshold of 5% was adopted.

Results: The study incorporated 85 patients. Mean age was 63.7 ± 9.2 years and the male:female ratio was 1.8:1. Incidence of POAF in the studied population was 18.8%. The mean age was 68.4 ± 7.0 years in POAF patients and 62.7 ± 10.4 years in those without POAF ($P=0.0386$). Sex, smoking, dyslipidemia, and type 1 diabetes were not significant predictors of postoperative AF (OR 1.13, 95% CI 0.36-3.49, $P=0.8386$; OR 0.51, 95% CI 0.15-1.80, $P=0.2929$; OR 0.99, 95% CI 0.32-3.07, $P=0.9893$; and OR 0.67, 95% CI 0.13-3.42, $P=0.6366$). Similarly, obesity did not show significant association (OR 1.70, 95% CI 0.53-5.41, $P=0.3637$). Type 2 diabetes was statistically associated with a greater risk of POAF (OR 3.60, 95% CI 1.11-11.69, $P=0.0227$). Surgeries with CPB times >90 minutes presented a POAF OR of 1.45 and 95% CI of 0.47-4.49 ($P=0.506$). All-cause mortality was higher in CABG patients who developed POAF (OR 7.73, 95% CI 1.08-55.2, $P=0.015$).

Conclusion: POAF was diagnosed in 18,8% of CABG patients with CPB. According to the international literature, POAF was associated with an increased all-cause mortality in this population. As in previous studies, age and type 2 diabetes were associated with a greater risk of POAF. Selecting the group of patients who may benefit from an specific prophylactic strategy should be the aim of further studies.



• FT 32

Cardiac Revascularization and Lobectomy for Pulmonary Adenocarcinoma: A Case Report

Vanessa Andrighetti Azevedo, Martina Brandeburski Camargo, Bruno Jardim Tesheiner, Carolina Tonin Silvestri, Carlos Henrique Giacomini Paes, Caroline Becker, Felipe Ziolkoski Izéria, Nathalia Faleiro, Victória Bauler Jones, Vitória Amaral Tavares

Introduction: Adenocarcinoma is the most common subtype of non-small cell lung cancer, accounting for approximately half of all lung cancers according to the World Health Organization. It affects both smokers and non-smokers, although its pathophysiology is primarily associated with smoking and genetic alterations. In the present case, the patient underwent cardiac revascularization due to acute myocardial infarction and lobectomy for the treatment of adenocarcinoma during the same procedure.

Case Report: A 56-year-old male patient with ischemic heart disease, diabetes, dyslipidemia, and previous stent placement in 2020 and 2021, presented with a lung lesion of unclear etiology, warranting surgical resection due to suspected lung neoplasia. Computed tomography revealed multiple nodules, measuring up to 0.4 cm, in the right lung. Carotid Doppler ultrasound showed no abnormalities, while the echocardiogram revealed degeneration of the aortic and mitral valves along with mild mitral regurgitation. Cardiac catheterization revealed the presence of significant stenoses. The patient underwent right lower lobectomy for the removal of a lung nodule and cardiac revascularization due to a previous acute myocardial infarction (multivessel coronary artery disease with proximal stenosis of the first and second diagonal branches, proximal stenosis of the marginal branch, and distal stenosis of the posterior descending artery and posterolateral branch).

Discussion: Lobectomy is a frequently used surgical procedure for the treatment of lung cancer, involving the complete resection of the affected lobe. It can be categorized anatomically as right or left upper lobectomy, right or left lower lobectomy, and middle lobectomy. Additionally, it can be performed using conventional thoracotomy, video-assisted thoracic surgery (VATS), or robotic-assisted procedures. In the case of the patient in question, a conventional right lower lobectomy was performed. This procedure involves ligating the artery supplying the right lower lobe, dividing and suturing the bronchus of the right lower lobe, and ligating the pulmonary vein draining the right lower lobe. Prior to the procedure, the patient experienced an acute myocardial infarction. Therefore, cardiac revascularization was necessary in conjunction with the right lower lobectomy to restore blood circulation to the cardiac muscle and resume its function. This procedure, commonly known as “coronary artery bypass grafting”, involves creating a bypass between the aorta and the heart using a graft from the saphenous vein.



• FT 33

Coronary Artery Bypass Grafting (CABG) in the Newest State of the Brazilian Union: Epidemiological Study about the Scenario of CABG and its Outcomes in Tocantins in the Last 10 Years

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Objective: To analyze the number of hospitalizations, types of care, mortality rates, mean hospitalization costs and the municipalities associated with the performance of coronary artery bypass grafting (CABG) in the state of Tocantins over the last decade.

Methods: A statistical, descriptive and cross-sectional analysis using data from the Department of Informatics of the Brazilian Unified Health System (DATASUS), according to the Hospital Information System (SIH/SUS) from January 2013 to April 2023.

Results: During the analyzed period, 1,037 hospitalizations for CABG were recorded, especially from 2017 to 2019, constituting approximately 40% of the prevalence observed during the 10 years analyzed. Notably, 2019 had the highest number of hospitalizations, corresponding to 148 cases. Still referring to the distribution of cases per year, with the exception of the first months of 2023, the years 2020 and 2021 correspond to the periods with the lowest numbers of procedures performed, being 80 in 2020 and 54 in 2021, the lowest rate of the entire period analyzed. Among the localities of the state, the procedures were distributed only in two locations: the capital city of Palmas and the municipality of Araguaína. Among them, there is a higher concentration in the municipality of Araguaína, accounting for 803 procedures, which corresponds to a relative frequency of approximately 77.5% of the CABG surgeries in the state during the last decade. Regarding the nature of care, about 70% (710 cases) were conducted as elective procedures, while the remaining 327, approximately 30%, were performed in an emergency situation. The observed mortality rate represented 9.73% of the cases, being equivalent to 101 deaths. The mean cost of hospitalizations was R\$ 12,631.26.

Conclusion: From the data collected, it is clear that in the last decade Tocantins, despite being a new state, with the 4th smallest population of the federation, emerged as an active state in the performance of CABG, either with or without the use of CPB, with one, two or multiple grafts, showing a growing annual increase in interventions, with 2019 as the record holder in cases. However, unfortunately the subsequent two years witnessed a decrease in these numbers, a fact justified by the Covid-19 pandemic, behaving as a great obstacle to the continuation of the procedures during that period. In this scenario, it is important to highlight the performance of the municipality of Araguaína, with the numbers surpassing the capital and being the stage for the majority of CABG procedures in the state. Mortality rates are still higher when compared to large national centers and/or international indices, reflecting the immense complexity presented in a tertiary and regional reference service. Thus, the performance of the state in CABG procedures is notorious, in which the current moment is configured as a 'rewarming' regarding performance and advancement in the quantity and quality of CABG surgeries. Through this, the state draws the rise of cardiac surgery reference for the entire region.



• FT 34

Differences Between Interventions for the Treatment of Acute Myocardial Infarction: Analysis of Systematic Reviews

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Objective: To compile and analyze the evidence available in systematic reviews regarding the different interventions performed for the treatment of acute myocardial infarction.

Methods: To carry out the search, we used the combination of words (“Angioplasty”[Mesh] AND “Myocardial Revascularization”[Mesh] AND (coronary [Title/Abstract]) AND (cardiac surgery [Title/Abstract])) on the PubMed platform. We applied the filter for systematic reviews, which guaranteed 6 studies published between 2003 and 2012. Two publications were discarded from the current summary; one did not find results for the surgical intervention and the other had been updated.

Results: The analyzed studies mainly compared coronary angioplasty, percutaneous coronary intervention (PCI) with rotational atherectomy, elective and emergency coronary artery bypass grafting (CABG), drug-eluting stent, and percutaneous interventions performed in services with or without on-site cardiac surgery. Cerebrovascular events seem to occur more with CABG than with drug-eluting stents (OR=0.46). Regarding the risk of mortality, it was reduced in percutaneous intervention performed in centers with cardiac surgery support and in cases of angioplasty (6.1%) compared to angioplasty followed by surgery (7.6%), and in elective CABG in comparison with emergency surgeries. Based on the information described in the articles, it is clear that no statistically significant associations were mentioned. The results showed a variety of findings, with significant differences between centers with and without on-site cardiac surgery. As for primary PCI, some studies did not indicate a significant difference in in-hospital mortality or in the need for early cardiac surgery between the two types of centers. However, other studies have shown a much greater risks in centers without cardiac surgery, especially in low-volume centers. As for non-primary PCI, the results were inconclusive, as some studies demonstrated a similar risk of in-hospital mortality risks and the need for early heart surgery between the two types of centers, while the other studies used showed divergent results. It is also worth mentioning that the volume of cases performed in each type of center greatly influenced the results, where low-volume centers without on-site cardiac surgery demonstrated a possible increase in the risk of mortality, while high-volume centers did not demonstrate significant differences.

Conclusion: In general, the analyzed studies did not demonstrate significant associations between the procedures described, but there were differences between centers with and without on-site cardiac surgery, where the risk in centers without cardiac surgery was higher. However, in primary PCI, for example, there was no significant difference either in in-hospital mortality or in the presence or absence of centers with cardiac surgery. In addition, the volume of procedures performed at each center also influenced the results, demonstrating that the data are very unique and differ from place to place. Finally, it should be noted that studies in the area are scarce, which makes analysis and discussion on the subject even more difficult. This is mainly due to the difficulty of carrying out randomized studies of this nature, since participants can be exposed to excessive risks, thereby raising ethical concerns.



• FT 35

Effects of a Package of Measures Based on Non-surgical Skills and Surgical Coaching on CABG Outcomes: A Pre-Post-Intervention Study

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Introduction: While the impact of non-surgical skill training and surgical coaching has been well-established in various surgical areas, its specific effect on patient outcomes in coronary artery bypass grafting (CABG) remains limited and fragmented.

Objective: To assess the impact of a package of quality initiatives, based in non-surgical skills and surgical coaching, on the morbidity and mortality of patients undergoing CABG.

Methods: A prospective, multicenter, interventional observational cohort study in the Paulista Registry of Cardiovascular Surgery II (REPLICCAR II) with continuous and mandatory data collection between July 2017 and June 2019. Propensity score matching (PSM) was used for the adjustment of the groups pre- and post-implementation of interventions, followed by the construction of a multiple model to predict mortality. For a better analysis, the record was divided into three phases: 1) Pre-implementation period of the package of quality initiatives (July/2017-March/2018), 2) Implementation period (April/2018-September/2018), and 3) Post-implementation period (October/2018-June/2019). The study analyzed patients undergoing isolated CABG at the 5 participating hospitals (N=4,018) of the PREPLICCAR II. Adjustment by PSM created two comparable groups, resulting in 2,170 patients. The intervention consisted in training participating teams in non-surgical skill-based concepts, including surgical coaching, at each of the five participating centers. Outcomes compared between pre- and post-implementation groups were reoperation, deep sternal wound infection/mediastinitis, stroke, acute kidney injury, ventilation time >24 hours, length of stay <6 days, total length of stay >14 days, morbidity and mortality, and operative mortality.

Results: In the post-implementation period, there was a significant reduction in deep sternal wound infection/mediastinitis ($P<0.001$), kidney failure ($P=0.014$), ventilation time >24h ($P=0.009$) and operative mortality ($P=0.046$).

Conclusion: Non-surgical skills training and surgical coaching were associated with a 61.7% reduction in operative mortality after CABG. The fact that there was no reduction in all complications but in mortality may be related to a decrease in failure to rescue in the post-implementation period.



• FT 36

Epidemiological Analysis of Mortality from Recurrent Acute Myocardial Infarction in the Last Decade in Brazil

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Objective: This study aims to analyze and compile data to draw an epidemiological profile of patients who died from recurrent acute myocardial infarction (RAMI) in Brazil over the past decade.

Methods: This is a cross-sectional epidemiological study on mortality attributed to RAMI between 2011 and 2020 in Brazil. Data were collected retrospectively, quantitatively, and descriptively from the Department of Informatics of the Brazilian Unified Health System (DATASUS). The variables analyzed were gender, age group, regions, and races.

Results: According to the data retrieved from DATASUS, 1,884 deaths from RAMI were documented in Brazil during the analyzed period. Comparing the number of deaths recorded in the second half of the decade (2016 to 2020) to the first half (2011 to 2015), there was a 12.4% increase in RAMI-related mortality. These findings corroborate the study conducted by Nelson et al. (2016), which estimates a substantial increase in the absolute incidence of recurrent infarction as a consequence of the expectation of about a 7-fold increase in coronary artery diseases in the future. Higher mortality was observed in individuals >80 years (477, 25.31%), followed by those aged 60 to 69 years (473, 25.1%), 70 to 79 years (455, 24.15%), 50 to 59 years (287, 15.23%), 40 to 49 years (131, 6.95%), 20 to 39 years (54, 2.86%), 10 to 19 years (4, 0.212%), and under nine years (2, 0.106%). Additionally, one (0.05%) death had an unknown age group. The highest mortality in self-declared skin color/race was among identifying as white (912, 48.4%), followed by those identifying as brown (775, 41.1%), black (103, 5.4%), yellow (nine, 0.4%), and indigenous (four, 0.2%). Moreover, 81 (4.29%) cases had an unknown race. The male sex represented 62.73% of the total deaths recorded in the period. Analyzing the Brazilian regions, the highest incidence of RAMI-related deaths was in the Northeast with 777 deaths in ten years (41.24%), followed by the Southeast with 556 (29.51%), the South with 268 (14.22%), the North with 198 (10.5%), and finally the Center-West with 85 deaths (4.5%).

Conclusion: In the present study, we observed a higher frequency of RAMI among white men, older than 80 years, and residents of the Northeast region. Thus, we can conclude that the number of deaths is increasing since the beginning of the decade, reaching its peak in 2018 with 223 deaths. Considering the demographic transition that Brazil has been going through in recent years and the consequent increase in the elderly population, we must start thinking about public measures to prevent AMI and optimize care for survivors of a primary AMI to prevent its recurrence.



• FT 37

Establishment and Three-Year Outcomes of Robotic-assisted Hybrid Coronary Revascularization in the Middle East

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Introduction: Hybrid coronary revascularization (HCR) is a technique that merges coronary artery bypass grafting surgery and percutaneous coronary intervention approaches for the treatment of multivessel coronary artery disease. The surgical component of the procedure is minimally invasive and can be done using robotic technology that avoids the need for sternotomy.

Objective: The aim of this study is to examine all patients who underwent robotic-assisted HCR (RHCR) to evaluate the feasibility and safety of the procedure during the establishment phase.

Methods: This is a retrospective chart review conducted at King Faisal Specialist Hospital and Research Centre in Jeddah (KFSRC-J). The study focuses on patients who underwent RHCR between July 2018 to December 2020.

Results: Robotic-assisted HCR was performed on 78 patients (mean age: 56 years, range 43-72 years; 89.75% males) during the study phase. Left internal mammary artery grafting was used in all patients. There was no hospital mortality, and the mean hospital and intensive care unit (ICU) stay were 5.8 and 1.4 days, respectively. We found that 93.6% of the patients did not require blood transfusion. There were no major adverse cardiac events (MACE) and perioperative myocardial infarctions recorded. There was a 3.8% rate of postoperative complications. The percentages of surgeries converted to conventional and re-exploration for bleeding were 1.2% and 2.6%, respectively. The mean operation time was 164 minutes.

Conclusion: This study emphasizes on the safety and effectiveness of RHCR in treating patients with multivessel coronary artery disease. Moreover, RHCR offers an alternative, functionally complete revascularization option to a selected group of patients with minimal surgical trauma, short hospital and ICU length of stay, quick recovery, and a diminished need for blood transfusions.



• FT 38

Evolution of Left Ventricular Function from Preoperative to Postoperative Myocardial Revascularization Surgery

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Introduction: Coronary artery disease is one of the determinants of left ventricular dysfunction, either by muscle necrosis or areas of stunted or hibernating myocardium. There is evidence that shows benefit from coronary artery bypass graft (CABG) surgery on left ventricular function in patients with viable areas. However, with the emergence and spread of new pharmacological treatments and less invasive therapies, there is substantial clinical uncertainty regarding the actual benefits of treatment compared to other therapeutic modalities on ventricular function and patient prognosis. Furthermore, studies correlating clinical and epidemiological variables with the evolution of the ejection fraction (EF) parameter between pre- and postoperative stages of coronary artery bypass grafting are scarce.

Objective: The aim of the study was to evaluate the evolution of left ventricular function between pre- and postoperative periods, assessing whether there was improvement or worsening of left ventricular ejection fraction. Furthermore, the study aimed to analyze which variables interfere with a reduced EF preoperatively and in the evolution of postoperative ventricular function.

Methods: A retrospective analytical-observational cohort study, involving 238 patients who underwent revascularization procedures in three hospitals in the southern region of Paraná. The study evaluated epidemiological, clinical, laboratory, and echocardiographic variables, by comparing pre- and postoperative echocardiograms in the period from January 2014 to August 2022.

Results: Preoperative EF showed inverse association with postoperative EF, with improvement among patients with EF <50% ($P < 0.001$). Among these patients, the median EF went from 43 (34.5-47) to 49 (43.5-61.5). Smoking habit ($P = 0.032$) and higher body mass index (BMI) ($P = 0.047$) were associated with preoperative systolic dysfunction. Hypertension was found to be related to the outcome of worsening ventricular function postoperatively ($P = 0.026$). Furthermore, patients with preoperative EF <50% and lower body mass index had a higher risk of improved left ventricular function ($P = 0.021$).

Conclusion: Preoperative EF is related to the evolution of postoperative EF, that is, when revascularization is performed with reduced EF, there is a greater chance of improvement and recovery of possible viable areas. Smoking and high body mass index were associated with preoperative ventricular dysfunction in patients with indication for CABG surgery. Hypertension was linked to a higher risk of worsening of ventricular function in the postoperative period of CABG and individuals with reduced body mass index are more likely to improve their ventricular function postoperatively.



• FT 39

Factors Affecting Graft Patency and Long-Term Survival Outcomes after Off-Pump Coronary Artery Bypass Grafting

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Objective: To evaluate graft patency and long-term survival outcomes after off-pump coronary artery bypass grafting (OPCAB) and determine factors influencing these outcomes.

Methods: All 1,849 consecutive patients who underwent isolated OPCAB between January 2002 and October 2020 were studied. The study was approved by Bangkok Hospital Institution Review Board, under approval number 2022-36. Demographics, clinical baseline, surgical details and postoperative investigations/treatments were collected. This report focused on 610 (33%) patients who underwent a coronary computed tomography angiography (CCTA) or a coronary angiogram (CAG) after OPCAB. Of this group, 164 (26.9%) patients underwent CCTA or CAG based on symptoms. The mean age was 60.7 ± 9.7 years and 80.3% of patients were male. The mean time interval of CCTA or CAG after the operation was $954.6 \pm 1,288.6$ days. Graft types employed included left internal thoracic artery (LITA), right internal thoracic artery (RITA), radial artery (RA), gastroepiploic artery (GEA) and saphenous vein graft (SVG) in 96.9, 25.7, 61.5, 13.8, and 47.4% of patients, respectively. Fitzgibbon classification was used to classified graft patency (grade A: excellent graft with unimpaired runoff; grade B: stenosis reducing caliber of proximal or distal anastomoses or trunk to $<50\%$; grade O: occlusion). Stepwise variable selection was utilized in logistic regression and Cox regression analyses to determined factors influencing outcomes.

Results: The total number of evaluated anastomoses was 2,340. Overall graft patency was 90.8% (659/726) for LITA, 81.2% (134/165) for RITA, 85.3% (579/679) for RA, 82% (64/78) for GEA and 76.7% (531/692) for SVG. Type of grafts, target coronary arteries, sequential technique and T-graft from LITA were considered factors for graft occlusion. In stepwise regression analysis, RA ($P=0.001$, odds ratio [OR]=1.74), GEA ($P=0.02$, OR=2.11), RITA ($P<0.001$, OR=2.34), vein T-graft ($P=0.002$, OR=2.52) and SVG ($P<0.001$, OR=2.91) were significantly associated with higher occlusion rates compared to the LITA graft, while no association was found with RA T-graft, sequential technique, and target coronary arteries. Forty-nine patients (8%) underwent postoperative percutaneous coronary intervention. Twenty-four patients (3.9%) died during the follow-up period. The survival rates at 1 year, 3, 5, 10 and 15 years were 100, 99.8, 99.2, 96.9 and 91%, respectively, with the mean follow-up time of 9.4 years. In Cox regression analysis, the stepwise selection procedure identified four out of 33 variables (demographics, surgical details, and postoperative investigations/treatments) significantly associated with survival outcome, namely age ($P<0.001$, hazard ratio [HR]=1.13), preoperative serum creatinine ($P<0.001$, HR=2.50), preoperative shock ($P=0.009$, HR=6.82) and postoperative acute coronary syndrome (ACS) or congestive heart failure (CHF, $P=0.01$, HR=19.84). Additionally, high low-density lipoprotein cholesterol ($P=0.07$) and no utilization of clopidogrel after operation ($P=0.09$) showed a trend towards lower survival rates.

Conclusion: In OPCAB, the grafts were ranked based on their patency rates, with LITA showing the most favorable patency, followed by RA, GEA, RITA, and SVG. The vein T-graft from LITA had a higher occlusion rate compared to RA T-graft from LITA. The 5-year and 10-year survival rates in this group were 99.2% and 96.9%. Age, preoperative shock, high preoperative serum creatinine and postoperative acute coronary syndrome or congestive heart failure were associated with poor survival.



• FT 40

Incidence of Pulmonary Complications in Coronary Artery Bypass Grafting Surgeries with Cardiopulmonary Bypass

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Objective: The aim of this study was to evaluate the incidence of pulmonary complications in patients undergoing coronary artery bypass grafting (CABG) surgeries with the use of cardiopulmonary bypass (CPB).

Methods: A literature review was conducted based on relevant scientific articles. Inclusion criteria encompassed studies investigating the incidence of specific pulmonary complications, such as atelectasis, pneumonia, and acute respiratory distress syndrome, in patients undergoing CABG surgeries utilizing CPB. The search led to the selection and analysis of four articles.

Results: Analysis of the selected studies revealed that the average incidence of pulmonary complications in CABG surgeries with CPB was approximately 25%. These studies encompassed a total sample of over 1,000 patients, with an age range varying from 40 to 80 years. The study by Ranucci et al. (2016) demonstrated a mean incidence of pulmonary complications of 25%, with atelectasis standing out as the most common complication, present in 15% of cases. Another study, by Kim et al. (2019), reported pneumonia as one of the most frequent complications, which aligns with the findings of other studies like Mazzeffi and Khelemsky's (2013) work. The study by Kozian et al. (2011) also reported other pulmonary complications such as pleural effusion and respiratory insufficiency. Furthermore, additional risk factors, including advanced age, prolonged CPB time, smoking, obesity, diabetes, and ventricular dysfunction, were identified in different studies as contributors to the development of these complications.

Conclusion: Pulmonary complications pose a significant concern in CABG surgeries with CPB. The incidence rate of these complications is approximately 25%, adversely affecting the morbidity and mortality of these patients. Early identification and appropriate management of these complications are essential to improve clinical outcomes and reduce the need for prolonged mechanical ventilation, hospitalization time, and the associated treatment costs. Preventive strategies such as optimizing preoperative lung function, protective lung ventilation during surgery, and postoperative respiratory physiotherapy can play a crucial role in reducing the incidence and severity of pulmonary complications, leading to enhanced recovery and favorable surgical outcomes.



• FT 41

Long-Term Follow-Up after Surgical Myocardial Revascularization in Patients with Preoperative Severe Left Ventricular Dysfunction

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Objective: Severe left ventricular (LV) dysfunction has been a risk factor for patients undergoing surgical revascularization. Long-term follow-up of these patients after successful surgery has been documented in only a few studies. In this study, we present a follow-up of patients with preoperative severe LV dysfunction after surgical revascularization.

Methods: This retrospective cohort study was conducted at a single center. Patients were recruited from January 2012 to December 2019. Subjects who underwent elective, isolated coronary artery bypass grafting (CABG) with a left ventricular ejection fraction (LVEF) of less than 35% were enrolled. All patients were in normal sinus rhythm and were followed-up for more than 6 months with documentation of LVEF. The subjects were divided into two groups: group 1 with an LVEF of 26-35% and group 2 with LVEF of 25% or lower. Data was collected from electronic hospital records and a telephonic interview was conducted with all patients about their functional status. Data was analyzed using statistical software SPSS 16. Institutional ethics approval was taken.

Results: A total of 80 patients (mean age 58.39 ± 9.45 years; 69 men) were recruited. Among them, 63 patients were in group 1 (LVEF of 26-35%) while 17 patients were in group 2 (LVEF $\leq 25\%$). The mean follow-up period was 44.27 ± 30.58 months. Out of the 80 cases, 31 patients (38.7%) underwent total arterial revascularization and 49 (61.2%) received one artery graft (left internal mammary artery to left descending artery) and rest reverse saphenous vein grafts. The choice of total arterial revascularization *versus* combined arterial and venous grafts was as per surgeons' decision. All patients underwent off-pump coronary artery bypass grafting. There were no significant differences between the groups in terms of number of grafts (3; 1-4 in group 1 vs. 2; 2-3 in group 2), or the use of an intra-aortic balloon pump (5/63; 7.9% in group 1 vs. 1/17; 5.8% in group 2). Overall, 20 out of 80 patients (25%) had poor outcomes (17/63 in group 1 vs. 3/17 in group 2, $P=ns$). Among the 20 deaths, 12 occurred within 30 days of surgery while 8 occurred during the follow-up period, with no difference between the two groups. The LV size and function did not change significantly after operation or during the follow-up period. At the last follow-up, 75% (60/80) of patients survived. There was no significant difference in the need for re-hospitalization between the two groups ($n=9$; 14.3% vs. 0 in group 2; $P=ns$). However, a significantly higher number of patients in group 2 developed dyspnea NYHA II or greater during the follow-up (8/17; 47.1% in group 2 vs. 14/63; 22.2% in group 1; $P=0.04$). All eight patients became symptomatic within 12 months of the primary surgery and were successfully managed with medical treatment.

Conclusion: Patients with severe LV dysfunction had an overall long-term survival of 75% after CABG. The severity of LV dysfunction (LVEF 26-35% vs. $\leq 25\%$) did not affect the mortality. However, patients in group 2 (severe LVEF) more often developed dyspnea within a year of surgery.



• FT 42

Persistent or Permanent Preoperative Atrial Fibrillation is an Independent Risk Predictor for In-Hospital Post-CABG Mortality and, When Associated with EuroSCORE II, Improves the Predictive Accuracy of the Score

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Introduction: A considerable number of patients referred for coronary artery bypass graft (CABG) surgery have persistent or permanent atrial fibrillation (AF). Despite its significant occurrence, the impact of this arrhythmia on surgical outcomes remains uncertain.

Objective: To assess the impact of persistent or permanent AF on in-hospital outcomes following CABG surgery.

Methods: A cohort of 3,124 patients who underwent isolated CABG surgery between 2010 and 2020 was evaluated. A propensity score matching approach was applied. The regression model used for constructing the propensity score considered persistent or permanent AF as a dependent variable and another 19 baseline characteristics as independent variables. Matching was performed at a 3:1 ratio, resulting in two groups: Group 1, consisting of 324 patients without persistent or permanent AF; and Group 2, composed of 108 patients with the documented diagnosis of persistent or permanent AF. The statistical plan also included normality analyses, descriptive and univariate analyses, binary logistic regression, receiver operating characteristics (ROC) curves and DeLong test to compare the curves. The significance level adopted was 5%. The programming language Python was used for performing the analyses.

Results: None of the baseline characteristics evaluated showed a significant difference between the groups, including EuroSCORE II (Group 1: 1.54 ± 1.45 vs. Group 2: 1.49 ± 1.59 ; $P=0.990$). Likewise, none of the analysed surgical characteristics showed a significant difference, indicating a very approximate complexity pattern of the surgeries. The absence of differences demonstrated a high degree of homogeneity within the groups. The use of matching by propensity score aimed to form two extremely similar study groups, which differed only in relation to the diagnosis of the arrhythmia under study. Among the outcomes evaluated, acute myocardial infarction (AMI) (1.5 vs. 6.5; $P=0.013$), major adverse cardiac and cerebrovascular events (MACCE) (7.1% vs. 14.8%; $P=0.015$), and death (1.5% vs. 6.5%; $P=0.013$) had significantly higher incidences in Group 2, formed by patients with persistent or permanent AF. From the multivariate analysis, it can be identified that permanent AF was an independent risk predictor for the occurrence of in-hospital death (OR: 5.009; 95% CI 1.433-17.507; $P=0.012$). Finally, it was also possible to verify that the association of EuroSCORE II with persistent or permanent AF showed higher predictive accuracy than EuroSCORE II alone (ESII + FA = AUC 0.852 vs. ESII alone = AUC 0.775, $P<0,05$).

Conclusion: Patients with persistent or permanent AF had significantly higher incidences of AMI, MACCE, and in-hospital death. Persistent or permanent AF was characterized as an independent predictor for the occurrence of death and the association with the EuroSCORE II resulted in a 9.9% increase in the predictive accuracy of the surgical risk score.



• FT 43

Quality of Life after Robotic Hybrid Coronary Revascularization *versus* Conventional Coronary Artery Bypass Grafting

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Introduction: Very few studies have compared the quality of life (QoL) of patients who underwent robotic hybrid coronary revascularization (RHCR) and coronary artery bypass grafting (CABG) surgery. This study assesses and compares the QoL measures in a cohort of patients in the Middle East who underwent RHCR and conventional CABG on a 12-month follow-up.

Methods: This study included all adult patients treated with RHCR at our institution between July 2018 and December 2019 (N=17), and a consecutive group of 17 patients who underwent conventional CABG during the same period. The Medical Outcomes Study Short Form (SF-36) questionnaire was administered over the phone 12 months after surgery to measure QoL indices.

Results: There were no differences in the preoperative data between the two groups. There were no differences between the RHCR and CABG patient groups across five SF-36 domains obtained at 12 months of follow-up. The QoL scores were superior in physical functioning ($P<0.001$), role limitations due to physical health ($P=0.044$), and role limitations due to emotional problems ($P=0.019$) in the RHCR group when compared to the conventional CABG group. The other domains such as pain ($P=0.99$), energy and fatigue ($P=0.65$), social functioning ($P=0.67$), emotional well-being ($P=0.91$), and general health ($P=0.21$) did not have any statistically significant differences between the groups.

Conclusion: Patients who underwent RHCR had better physical functioning, lesser role limitations due to physical health and emotional problems in the 12-month postoperative follow-up compared to those who underwent conventional CABG. The remaining domains did not differ significantly between patients who underwent RHCR and conventional CABG. RHCR provides a truly less invasive alternative to conventional CABG in patients with multivessel coronary artery disease without compromising the QoL outcomes as reported by patients.



• FT 44

Risk and Protective Factors of Complications on Coronary Artery Bypass Graft Perioperative Period: A Systematic Review

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Objective: To analyze the statistically significant risk factors during the preoperative and intraoperative periods related with complications following coronary artery bypass grafting (CABG) surgery.

Methods: Systematic review focused on articles published within the last 2 years and retrieved from the MEDLINE database (via PubMed) as per PRISMA guidelines using MeSH terms “postoperative period” AND “complications” AND “bypass surgery, coronary artery”. The analysis was double-blinded and included full-text articles describing complications in patients who underwent isolated elective CABG. A total of 273 articles were found, with 240 excluded after title analysis, and 11 after the abstract review. Ultimately, 22 articles remained for the final analysis.

Results: Postoperative atrial fibrillation (POAF) usually occurs between the 1st and 6th postoperative days, peaking at the 2nd day, with an average incidence of 37.84% in 1,482 patients. POAF increased the doses of noradrenalin by 27.69% at the intensive care unit (ICU), the need for an intra-aortic balloon pump by 20.83%, and chances of death by 16.67%. The predictive factors are need for intraoperative transfusion, diabetes mellitus (DM) and fragmented QRS complex with altered hemoglobin levels, increasing the chances of POAF by 1.6, 0.3 and 2.5 times, respectively. The use of minimally invasive cardiopulmonary bypass (MICPB) was a protective factor. The decompensation of chronic cerebral ischemia, related or not to small/moderated carotid stenosis, affected, in 182 patients, 32% of the group without stenosis, and 52% of the group with stenosis, and 3.5% evolved to acute cerebral circulatory disorder, increasing the risk of premature death. Beyond that, 54-65% of patients presented cognitive dysfunction. The risk factors found were advanced age, peripheral arterial disease, re-exploration for bleeding, perioperative myocardial infarction, increased CO₂ pressure and hyperlactemia. The use of MICPB was a protective factor when compared with conventional CPB. Postoperative hypothermia at ICU admission (temperature <36°C) affected 29.4% of 1,979 patients, correlating with increased transfusions, intubation duration, and ICU stay. Risk factors were advanced age, female gender, and low body mass index. Acute kidney injury (AKI) reached 26% of 115 patients, evolving to kidney failure in 3.3% and requiring renal replacement therapy in 1-5% of the cases. Transesophageal echocardiography was used to evaluate the arcuate or interlobar arterial flow by injecting a sample volume, then measuring the renal resistive index (RRI). When RRI was >0.7, AKI rates were 46.15%; conversely, the rates were 15.75% when RRI was <0.7. Low prognostic nutritional index and DM were also risk factors. Infections are common and might evolve to pneumonia, which increases the likelihood of death by 5-10 times. Risk factors are kidney disease, congestive heart failure, DM and chronic obstructive pulmonary disease. Pleural effusion occurred in 63% of 1,829 patients in the first 30 days after surgery, with 14.4% of them requiring drainage around the 8th-9th day. This resulted in prolonged intubation duration by 6 times and a 6.8% increased risk of AKI. Predictive factors were smoking and preoperative arrhythmia.

Conclusion: The main risk factors are the presence of DM, kidney diseases, vascular problems and advanced age, leading to a higher need for transfusions and reintubation, a longer intubation duration, postoperative arrhythmia, kidney failure and pericardial effusion. This worsens the prognosis and patients' health. The major protective factor found was the use of MICPB during the surgery.



• FT 45

Surgical Treatment of Patients with Coronary Artery Disease and Carotid Artery Stenosis

Mikhail Fomenko, Yuri Schneider, Victor Tsoi, Alexander Pavlov, Pavel Shilenko

Introduction: Systemic atherosclerosis often leads to a combined lesion of the coronary and carotid arteries in 2.4-14% of cases. Optimal surgical approach for this patient cohort remain uncertain, with ongoing discussions on various surgical techniques and their advantages.

Objective: This study aims to evaluate the results of various surgical approaches for patients with simultaneous lesions of the coronary and carotid arteries.

Methods: Recruitment of patients for this study was conducted through “continuous observation” in a retrospective manner. Between September 2012 and April 2023, 5,589 patients at our center underwent surgical treatment for coronary artery diseases. Combined lesion of brachiocephalic artery was diagnosed in 895 (16.1%) cases. The mean age of patients in the study group was 65.9 ± 14.2 years, ranging from 38 to 84 years. Among the patients, 266 (29.7%) were aged over 70 years, with a dominant representation of men, totaling 636 (71.1%). Bilateral lesions of the brachiocephalic artery were detected in 140 (15.6%) cases. Staged surgical treatment (1-carotid endarterectomy, 2- coronary artery bypass grafting) was performed in 730 (81.3%) cases, and simultaneous in 168 (18.7%) cases. The risk stratification of patients according EuroSCORE II was $2.2 \pm 1.2\%$.

Results: Hospital mortality between Staged and Simultaneous groups was 3 (0.4%) and 4 (2.4%), respectively. Most patients in both groups underwent eversion carotid endarterectomy (97.8%). The incidence of complications including postoperative bleeding, wound infection, stroke, and acute myocardial infarction (AMI), showed no significant differences between groups: 7 (0.9%) and 2 (1.2%) ($P=0.644$); 5 (0.7%) and 1 (0.6%) ($P=1.0$); 0 and 0; 1 (0.1%) and 1 (0.6%) ($P=0.339$). In a cumulative analysis encompassing all hospitalizations, the group of simultaneous operations showed a statistically significant advantage ($P<0.01$). Simultaneous carotid endarterectomy (CEA) with coronary artery bypass grafting (CABG) and staged CEA followed by CABG demonstrated no significant differences in long-term survival: 92.7% and 89.2%, AMI 8.7% and 7.7%, and stroke 5.5% versus 8.2% after remote observation at 65.1 months.

Conclusion: Based on patient comorbidities and severity of diseases, using state-of-the-art surgical treatment, latest means of anesthesia and postoperative patients management, it is possible to perform CABG and CEA safely and effectively, either staged or simultaneously, in patients with multifocal atherosclerosis.



• FT 46

Survival and Mid-Term Outcomes of On-Pump *versus* Off-Pump Coronary Artery Bypass Graft Surgery: A Propensity Score-Matched Analysis from the First Peruvian Registry

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Objective: The efficacy and outcomes of on-pump and off-pump coronary artery bypass graft surgery (CABG) remain uncertain, especially in Latin America. Our study aims to explore survival and short- and mid-term outcomes in the first reported Peruvian registry of patients treated with both techniques.

Methods: An observational, analytical, longitudinal study using a propensity score-matched (PSM) analysis in a single-center retrospective registry of 2,280 patients treated with CABG (on-pump=1,825 vs. off-pump=455) between 2000 and 2019. Among these, 846 patients were analyzed after PSM (on-pump=423 vs. off-pump=423). Baseline variables, comorbidities, and major outcomes were studied in the short term (<30 days), such as mortality, blood transfusion, reintervention, arrhythmia, and renal failure; as well as mid-term (30 days-36 months) with major adverse cardiac and cerebrovascular events (MACCE) such as mortality, myocardial infarction, stroke, and new revascularization. The matched groups were compared by descriptive, multivariate, and Kaplan-Meier survival analyses.

Results: The overall mean age of the patients was 65.32 years, and more than 50% were male. The main comorbidities were diabetes mellitus type 2 (39%), and, before PSM, previous myocardial infarction <7 days (27.03%) and ejection fraction <50% (45.72%) were higher in the off-pump group ($P<0.05$). After PSM, pre-surgery PCI (27.18% vs. 26.71%, $P=0.049$) and a higher STS risk score (1.98% vs. 1.90%, $P=0.047$) were evident in the off-pump group. In the short term, the on-pump group exhibited higher mortality (2.12% vs. 0.47%, $P=0.048$), blood transfusion >500 ml (57.91% vs. 7.56%, $P=0.049$), reintervention (7.32% vs. 2.12%, $P=0.045$), longer hospital stay (9 vs. 4 days, $P=0.048$), arrhythmia (9.92% vs. 4.96%, $P=0.049$), and renal failure (20.09% vs. 5.91%, $P=0.009$). Long-term mortality (4.25% vs. 1.65%, $P=0.044$), myocardial infarction (17.02% vs. 7.32%, $P=0.046$) and repeat revascularization (17.49% vs. 8.26%, $P=0.045$) predominated in the on-pump group. There was a higher 36-month adjusted survival for off-pump CABG over on-pump (97.88% vs. 93.63%, $P=0.046$).

Conclusion: This first reported Peruvian registry of patients treated with CABG has demonstrated that off-pump surgery is associated with lower short- and mid-term morbidity and mortality rates, as well as better-adjusted survival rates compared to on-pump procedure; however, further multicenter studies in Latin America are needed to elucidate its benefits over the classic on-pump CABG.



• FT 47

Recent Trends in the Approach to Prevention and Treatment of Coronary Artery Disease: Emphasis on Non-Invasive Intervention

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Introduction: Coronary artery disease (CAD) stands as a leading cause of morbidity and mortality worldwide. Over the past decades, there has been a growing interest in the non-invasive approach as an effective strategy for preventing and treating the disease.

Objective: The aim of this study is to review recent trends in the approach to CAD prevention and treatment, with a specific focus on non-invasive intervention. The hypothesis tested is that the non-invasive approach offers significant benefits in reducing disease incidence and improving patient clinical outcomes.

Methods: A literature review was conducted using scientific databases including PubMed, Scopus, and Web of Science, employing the following MeSH terms: “Coronary Artery Disease”, “Treatment”, “Prevention”, and “Non-invasive”. Studies that investigated and assessed non-invasive strategies such as lifestyle modifications, behavioral therapy, pharmacological interventions, and minimally invasive intervention techniques were included. The methodological quality of selected studies was evaluated to ensure result reliability.

Results: Lifestyle modifications have been recognized as a key strategy in primary and secondary CAD prevention. The adoption of a healthy diet rich in fruits, vegetables, whole grains, and low in saturated fats, coupled with regular physical activity, has been linked to a significant reduction in CAD risk. Additionally, stress management and smoking cessation play a crucial role in preventing the disease. In the realm of behavioral therapy, interventions targeting risk behavior modification, such as adherence to prescribed medications, have shown benefits in reducing adverse cardiovascular events. Health education and promotion of positive behavioral changes are essential components of this approach. Pharmacological interventions also play a significant role in CAD prevention and treatment. Drug therapy includes the use of statins, antiplatelets, and beta-blockers, which have demonstrated efficacy in reducing cardiovascular event risk in CAD patients. Minimally invasive intervention techniques have revolutionized the field of CAD treatment. Percutaneous angioplasty with stent placement has been widely adopted as an alternative to coronary artery bypass surgery in select cases. This non-invasive approach enables restoration of blood flow in obstructed coronary arteries, relieving angina and improving cardiac function. Moreover, advanced techniques such as bioabsorbable balloon angioplasty and the use of drug-eluting stents have shown promising results in terms of reducing restenosis and enhancing long-term clinical outcomes.

Conclusion: The non-invasive approach in CAD prevention and treatment is continuously evolving, providing a range of effective and safe therapeutic options. The integration of evidence-based, individualized non-invasive strategies is crucial for enhancing clinical outcomes, reducing morbidity and mortality associated with CAD, and improving patients' quality of life.



• FT 48

The FRAGILE Clinical Trial: The Impact of the Coronary Artery Bypass Graft on Frailty

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Introduction: The exponential increase in the elderly population has been observed worldwide, and it implies a higher incidence of coronary artery disease (CAD), and consequently the need for coronary artery bypass graft (CABG) surgery. The growing number of elderlies is also related to frailty, a syndrome that affects at least 10% of the elderly population and is an exceedingly effective parameter for correlating with the aging-related effects. Although the impact of frailty on mortality and morbidity are well established, there are no studies regarding the outcomes of CABG and its techniques in frail patients.

Objective: To evaluate the impact of CABG surgery on patient frailty and to compare differences in the frailty index after a 6-month follow-up between the off-pump and non-pump groups.

Methods: This study was a subanalysis of the FRAGILE trial, a Brazilian multicenter, randomized, controlled clinical trial that analyzed 169 patients aged 60 years or older who underwent coronary artery bypass graft (CABG) surgery with (on-pump) and without (off-pump) cardiopulmonary bypass. Using the Fried's Frailty Criteria, we classified the patients into frail, pre-frail, and non-frail, and also evaluated the five parameters of these criteria. Patients were divided into two groups: the off-pump CABG group (n=87) and the on-pump CABG group (n=82), and compared unintentional weight loss, self-reported fatigue, physical activity level, grip strength, and gait speed before and after surgery, and between groups. The study was approved by the local Ethics Committee and all patients signed the informed consent.

Results: We observed an improvement in the frailty status of patients who underwent CABG. Overall, over than 50% of frail patients became pre-frail after CABG, and only 3% of the total patients were classified as frail after six months of surgery. No patient was classified as non-frail preoperatively in both group because it was one of the exclusion criteria. There is no difference between the off-pump and on-pump groups. A positive impact was shown regarding the frailty criteria in all tests when comparing pre- and post-surgical measurements. The total time of physical activity and the grip strength exhibited substantial improvement in the post-surgical group, the gait speed and unintentional weight loss were lower after the 6-month follow-up, and patients reported less fatigue by comparing the before-surgery measurements.

Conclusion: CABG positively impacts patients' frailty after six months of surgery. Both on-pump and off-pump techniques showed similar results when comparing frailty features before and after CABG surgery.



• FT 49

Total Arterial Revascularization in Combined Aortic Valve Surgery

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Introduction: Coronary artery disease is prevalent in patients with severe aortic disease, affecting approximately one third of patients undergoing aortic valve replacement surgery, increasing its risk and complexity. Although total arterial revascularization has been shown to be beneficial in terms of survival and the need for new revascularization over time in patients undergoing pure coronary surgery, there is no evidence of the impact or risk of surgery combined with aortic valve procedures. It seems that the concept of total arterial revascularization, applied to pure coronary surgery, is not applied when revascularizing a patient with aortic valve disease in combined surgery.

Objective: To demonstrate that total arterial revascularization for single or multivessel disease is safe in patients undergoing combined aortic valve surgery and coronary revascularization, and to develop a standardized surgical technique to be able to perform total arterial revascularization with acceptable cardiopulmonary bypass times and low complication rates.

Methods: A retrospective observational study analyzing our database of patients who underwent combined aortic valve surgery and myocardial revascularization from January 2012 to December 2022. The inclusion criteria were aortic valve surgery, either replacement or repair, associated with coronary revascularization exclusively with arterial conduits. Patients in whom saphenous vein conduits were used and those with concomitant mitral valve surgery were excluded.

Results: In the period from 2012 to 2022, 139 patients underwent aortic valve surgery and myocardial revascularization. Total arterial revascularization occurred in 82 patients (61.6%), and included saphenous vein grafts in 51 patients (38.4%), who were excluded from the analysis. Of the total number of patients with arterial revascularization, 41 patients (50%) had a single bypass with the *in situ* left internal thoracic artery to the anterior descending artery, and 3 (2.2%) patients had a single bypass to the right coronary artery with the *in situ* right internal thoracic artery. A second arterial conduit was required in 38 patients (28.5%) with multivessel disease. The left radial artery was chosen as the second conduit in 18 patients (13.5%), and the right internal thoracic artery in 20 patients (15%). The configuration of the arterial conduits was Tector's T technique in 34 patients (89.4%), and in 4 patients both *in situ* internal thoracic arteries were used (10.6%). The overall 30-day mortality of the total arterial revascularized patients was 3 patients (3.6%). Among these, 2 patients in the branch of a single bypass to the anterior descending artery with the internal thoracic artery, both emergency surgeries, died from left ventricular failure in the postoperative period. The remaining death, in the left mammary and radial artery group, died of pneumonia in the context of a complicated postoperative period. There were no deaths in the double internal thoracic artery group.

Conclusion: Total arterial revascularization is safe in terms of 30-day mortality in patients with aortic valve disease undergoing combined surgery. Tector's T configuration for arterial revascularization in multivessel disease is a safe alternative that could simplify the operative technique, allowing total revascularization with arterial conduits with acceptable cardiopulmonary bypass times.



• FT 50

Trends in the Use of Multiple Arterial Grafts in Coronary Artery Bypass Grafting at a Referral Center in Latin America

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Introduction: The use of multiple arterial grafts (MAG) in coronary artery bypass grafting (CABG) is underused, even in recognized institutions.

Objective: The aim of this study was to assess trends in the use of MAG at a referral center in Latin America.

Methods: A trend analysis was performed on our institutional database to assess the use of MAG in patients undergoing isolated CABG during 3 periods: 2016-2017, 2018-2019, and 2021-2022. Patients undergoing emergency surgery, reoperations and surgeries performed in 2020 were excluded due to the outbreak of the Covid-19 pandemic in Brazil. Definitions of variables and outcomes followed version 2.81 of the STS Adult Cardiac Surgery Database. All analyzes were performed using the statistical package of the R software.

Results: A total of 750, 993 and 840 patients were operated on in the 1st, 2nd and 3rd study periods, respectively ($P=0.657$). The prevalence of MAG was 9.73%, 15.34%, and 46.9% in the 1st, 2nd and 3rd periods, respectively ($P<0.001$). Evaluating the type of arterial graft, the use of two internal thoracic arteries was 7.33%, 8.58%, and 11.43% in the 1st, 2nd and 3rd periods, respectively ($P<0.001$), and use of radial artery graft was 3.07%, 7.29%, and 38.57%, respectively, ($P<0.001$). On the other hand, total arterial CABG went from 0.67% to 0.91% and 3.1%, respectively ($P<0.001$). Likewise, there was no difference in relation to the occurrence of deep surgical wound infection, which was 7.6%, 7.25 and 5.36% in the 1st, 2nd and 3rd periods, respectively ($P=0.137$).

Conclusion: Following the evidence, the use of MAG in isolated CABG increased significantly in a referral center in Latin America. The most significant increase occurred with the use of radial artery grafts.



• FT 51

Bilateral Internal Mammary Artery Utilization in Coronary Artery Bypass Grafting

Mikhail Fomenko, Yuri Schneider, Victor Tsoi, Alexander Pavlov, Pavel Shilenko

Introduction: Coronary artery bypass grafting (CABG) is the primary surgical choice to treat patients with coronary artery disease. The gold standard in CABG is the use of the left internal mammary artery for revascularizing the left anterior descending artery. Most retrospective articles have indicated that the use of bilateral internal mammary artery (BIMA) showed better long-term survival when compared to a single internal mammary artery. Despite these results, the adoption of BIMA in CABG is not common in the treatment of coronary artery diseases.

Objective: This study aims to evaluate the effectiveness and safety of employing BIMA grafts in CABG.

Methods: Recruitment of patients in the study was conducted retrospectively by continuous observation. The primary endpoint was mortality, while secondary endpoints were myocardial infarction, stroke, and stenting of coronary artery. Between October 2012 and April 2023, 5,589 patients were examined and underwent CABG at our center. CABG with BIMA was performed in 3,007 (53.8%) cases. The mean age of the patients was 67.9 ± 14.2 years (range: 48 to 85 years). Male patients constituted the majority, accounting for 60.3% of the study population.

Results: Hospital mortality in the study group was 0.6% (18 patients). Operations was performed off-pump in 35.1% of cases, while 64.9% were on-pump. The main procedure-related complications were postoperative bleeding (56 patients, 1.9%), wound infection (35 patients, 1.2%), and stroke (5 patients, 0.2%). The mean time in the intensive care unit was 1.6 ± 0.5 days, and the mean time of hospitalization was 10.4 ± 2.2 days. The mean follow-up period for the study group was 65.9 months. Survival estimates using the Kaplan-Meier method showed a survival rate of 98.3% at 36 months, and 92.7% at 60 months for the study group.

Conclusion: Application of BIMA grafts in CABG has demonstrated both safety and effectiveness. These findings are reflected in the good mid-term results observed in the surgical treatment of coronary artery disease.



• FT 52

Analysis of the Number of Percutaneous Transluminal Angioplasty Procedures in a High-Complexity Service in the Municipality of Cascavel, Paraná

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Objective: The objective of this study was to analyze the number of angioplasties performed at Hospital São Lucas in Cascavel, Paraná, during the period from June 2020 to July 2021. The research used medical records and aimed to contribute to the knowledge of the patients' epidemiological profile and provide relevant information for health promotion planning.

Methods: The study employed a descriptive cross-sectional observational design with a quantitative approach. Medical records of patients who underwent percutaneous transluminal angioplasty during this period were analyzed, considering variables such as age, gender, medical history, and types of stents used. Patients over 40 years of age with risk factors who underwent percutaneous transluminal angioplasty were included in the study. Data collection was done through the Hospital Medical Archiving System, and approximately 100 medical records were analyzed. Since the study analyzed electronic medical records of around 100 hospital patients, without direct contact with the participants, it was conducted without the need for informed consent forms (ICFs). The waiver for ICFs was requested and approved by the ethics committee on 07/06/2022, under protocol: 58383322.5.0000.5219.

Results: The results showed that the majority of patients were male (71%), with an increase in the average age compared to previous years. The use of stents was lower in 2020 compared to 2021. There were a total of five deaths during the period, mainly due to cardiac arrest. Systemic arterial hypertension was the main comorbidity among patients, often associated with diabetes mellitus. The anterior descending artery was the most affected (57%), and acute ST-segment elevation myocardial infarction was the most common reason for angioplasty (37%). Despite the pandemic context, the number of angioplasty procedures increased, suggesting that the Cascavel population actively sought cardiac care. There was a significant increase in the number of angioplasties performed, with an average patient age of 64 to 66 years.

Conclusion: This study provided information about the profile of patients undergoing angioplasty at Hospital São Lucas. These results can assist in health planning strategies and the improvement of cardiac care provided by the hospital.



• FT 53

Catheter Ablation Using Pulmonary Vein Isolation with *versus* without Posterior Wall Isolation in Patients with Persistent Atrial Fibrillation: An Updated Meta-Analysis

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Objective: In this updated meta-analysis, we aimed to compare pulmonary vein isolation (PVI) alone *versus* PVI plus left atrial posterior wall isolation (PWI) in patients with persistent atrial fibrillation (AF).

Methods: PubMed, Embase, and Cochrane databases were searched for randomized controlled trials comparing PVI alone *versus* PVI + PWI in patients with persistent AF. The endpoints evaluated were: (1) recurrence of AF; (2) composite recurrence of atrial arrhythmias (AF, atrial tachycardia, or atrial flutter); (3) major complications; (4) mean procedure time. A systematic review was performed following the PRISMA 2020 flow diagram. Quality assessment was performed with the Revised Cochrane risk-of-bias tool for randomized trials.

Results: Our analysis encompassed eight studies involving a total of 1,119 patients, among which 561 underwent catheter ablation with PVI + PWI. During the intermediate follow-up (mean 12 to 24 months), the recurrence of AF was reduced in patients treated with adjunctive PWI (RR 0.66, 95% CI 0.44-0.98), but recurrence of composite of atrial arrhythmia was not different between groups (RR 0.83, 95% CI 0.65-1.06). Major complications (RR 0.81, 95% CI 0.42-1.58) were similar between groups, although the mean procedure time was shorter with PVI alone (mean difference -23.37 min, 95% CI -30.23, -16.50).

Conclusion: In patients with persistent AF, adjunctive catheter ablation with PWI reduced the incidence of AF recurrence rates, but did not improve the composite outcome of atrial arrhythmia. The procedure time was longer with PVI + PWI but this extension did not compromise overall safety with major complications associated with the procedure. Larger studies are needed to confirm these findings.



• FT 54

Comparative Study of Transcatheter *versus* Surgical Treatment of Tricuspid Regurgitation in Brazil

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Introduction: Patients with severe tricuspid regurgitation (TR) and previous cardiac surgery are considered at high operative risk or inoperable, thus, the implementation of less invasive therapies are of great interest and new options of transcatheter treatment were synthesized. Although these devices are still being studied and improved, there are quite a few transcatheter devices for the tricuspid valve are already available. These encompass coaptation devices, annuloplasty devices, complete valve replacement devices, and heterotopic replacement (caval) devices. The transcatheter procedure and surgical treatment can be performed in cases of primary or secondary etiology of TR.

Objective: In this study, our objective is to compare mortality results and costs between transcatheter and surgical treatment of TR.

Methods: Descriptive and transversal study of data from the Department of Informatics of the Brazilian Unified Health System (DATASUS), according to the Brazilian Ministry of Health - Hospital Information System (SIH/SUS) from January 2012 to April 2023. The analyzed topics were: type of procedure, number of hospitalizations, total cost, average cost of hospitalization, average length of hospital stay, deaths and mortality rate.

Results: In a total of 391 hospitalizations for TR treatment, the procedure with the biggest number of patients was surgical correction in adults, representing 53.2% (208 hospitalizations); the average cost of hospitalization for this procedure was R\$ 16,846.42; the mortality rate was 7.69% (30 deaths). The second most common procedure was valvuloplasty/replacement in patients with Ebstein anomaly, representing 20.71% (81 hospitalizations); the average cost of hospitalization is R\$ 27,270.50; the mortality rate was 11.11% (9 deaths). Pediatric TR treatment represented 16.62% (65 hospitalizations); the average cost of hospitalization was R\$ 25,410.74; the mortality rate was 6.15% (4 deaths). The procedure with the lowest number of hospitalizations was percutaneous treatment, representing 9.4% of the total (37 hospitalizations); the average cost of hospitalization as R\$ 5,504.59; the mortality rate was 2.70% (1 death). Comparing the average length of hospital stay, all surgical treatments (adults, Ebstein, and pediatric) resulted in 13 days whilst the percutaneous treatment resulted in 12 days.

Conclusion: We can conclude that the largest number of patients underwent isolated surgical treatment of the tricuspid valve (90.6% surgical, 9.4% transcatheter). Among surgical corrections, cases of Ebstein's disease exhibited the highest mortality, followed by correction in adults and children. The percutaneous procedure had a lower mortality. Although there is a difference of 1 day in average length of hospital stay, there is a great difference between the costs of surgical and transcatheter treatments, which is three times cheaper compared to adult surgical treatment, and five times more inexpensive compared to the cost of Ebstein's and pediatric interventions. With these data, we can conclude that in Brazil, despite the small number of patients that underwent percutaneous TR treatment, mortality and costs are lower in comparison to surgical treatment.



• **FT 55**

Endovascular Management of Spontaneous Infrarenal Abdominal Aortic Dissection: A Case Report

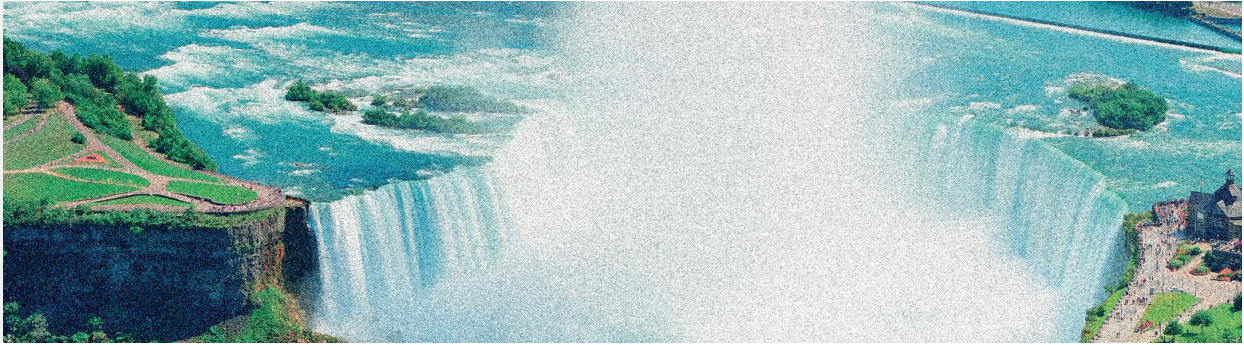
Daniel Robert Alexander, Bruno Mamede Lins Brasiliense, Frederico Carlos Cordeiro de Mendonça, Alvaro Daniel Ortuño Justiniano, Diego Maia Martins, Igor Gomes Cristo, Jeffer Moraes, Jairo Pinheiro Junior, Jorge Henrique Yoscimoto Koroishi, Stevan Krieger Martins

Objective: To describe a case of a patient with spontaneous dissection of the infrarenal abdominal aorta.

Case Report: A 54-year-old male patient of Latin ethnicity, with hypertension, non-insulin dependent diabetes, nodular thyroid disease and dyslipidemia, was admitted to the hospital after a routine abdominal ultrasound examination. The ultrasound detected the presence of a dissection flap located in the abdominal aorta. The patient was asymptomatic and, following physical examination, had only a decrease in peripheral pulses in the right lower limb. Further confirmation of the abdominal aortic dissection and subacute intramural hematoma was obtained through an angiotomography analysis. The dissection was located 3.4 cm below the emergence of the left renal artery, extending to the proximal portion of the left internal and external iliac arteries. Flow was observed in both lumens, extending to the common iliac arteries, ending in the proximal portion of the right external iliac artery and the proximal portion of the left internal and external iliac arteries. The false lumen in the right common iliac artery was occluded; however, a penetrating ulcerated plaque was noticed in its most distal portion. Aneurysms or enlargements were not observed. While investigating his medical history prior to hospitalization, he mentioned one isolated case of severe low back pain for four days, that initiated two weeks before hospital admission. The patient also mentioned a family history of aortic disease, which affected his father, but the true etiological diagnosis is unknown. Echocardiography analysis revealed normal diameter and flow throughout the thoracic aorta, myocardium with normal thickness and mass, preserved biventricular systolic function, with left ventricular ejection fraction of 73% and pericardium without signs of effusion. Despite elevated inflammatory evidence on routine laboratory and after excluding other diagnostic hypothesis (non-syndromic patient, syphilis, aortitis, or autoimmune diseases), the patient was deemed eligible for surgical management.

Results: Usual monitoring was performed and, soon after, the femoral arteries were dissected and exposed bilaterally. Systemic heparinization was achieved with 100 mg of unfractionated heparin. A bifurcated endoprosthesis was implanted, with its proximal extremity situated 2 cm below the left renal artery, extending to the bifurcation of the iliac arteries. To cover the whole extension of the dissection, three other endoprosthesis were also implanted: one in the left common femoral artery, one in the right common iliac artery and another in the left external iliac artery. At the end of the procedure, the patient was conducted to the intensive care unit (ICU). As an immediate complication, obstruction of the right internal iliac artery was observed on radioscopy, with no clinical implications noted. After one day of recovery in the ICU, the patient was taken to the general ward. The patient was discharged from the hospital on the 5th postoperative day, with no further intercurrents observed.

Conclusion: Spontaneous infrarenal abdominal aortic dissection is a rare entity in current practice, with an estimated incidence of 0.4-2% of all aortic dissections. Aortic rupture, lower limb ischemia, or chronic abdominal pain are complications that should be identified and, when possible, corrected. Endovascular therapy can be an appropriate treatment for the management of abdominal aorta conditions, including spontaneous infrarenal abdominal aortic dissection.



• FT 56 Fully Endoscopic Mitral Valve Surgery in Obese Patients

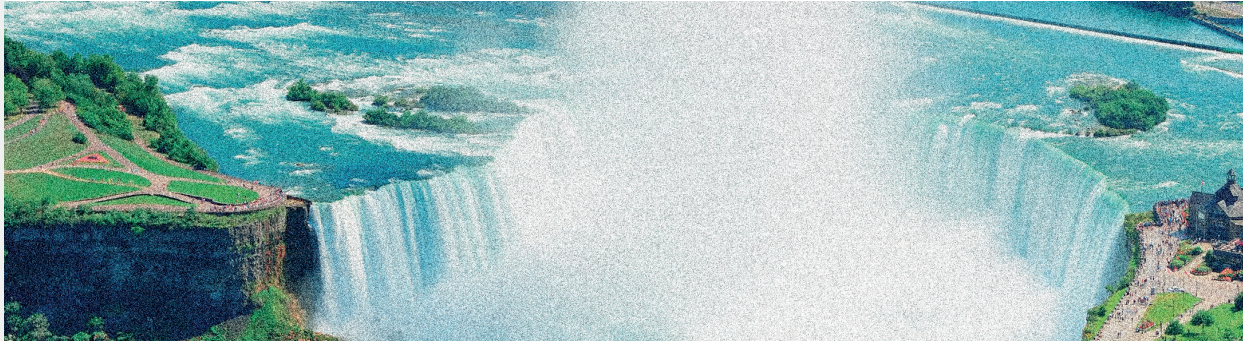
Oliver D. Bhadra, Jonas Pausch, Hermann Reichenspurner, Lenard Conradi

Objectives: Obesity may challenge surgeons performing fully endoscopic mitral valve surgery (EMS) and affect clinical outcomes. Therefore, the aim of this study is to evaluate the outcome of pre-obese and obese patients undergoing EMS at our center.

Methods: From 2015 to 2021, 605 patients underwent EMS, including cases with concomitant atrial ablation and/or left atrial appendage closure. Patients were stratified by normal weight (group 1, BMI 20-25; n=312); pre-obese (group 2, BMI 25-30; n=226) and obese (group 3, BMI >30; n=67). Group 1 was considered control group in a comparative analysis.

Results: Severe mitral regurgitation (MR) was the main indication in the overall cohort (97.8%). Mitral valve repair and replacement were performed in 92.7% and 7.3%, respectively. There were no differences in the rate of concomitant atrial ablation between groups (group 1 vs. 2: 18.9 vs. 20.6%, $P=0.64$; group 1 vs. 3: 18.9 vs. 16%, $P=0.36$). Cardiopulmonary bypass time (CPBT) and cross-clamp time (CCT) were significantly lower in group 1 compared to groups 2 and 3 (CPBT: 162.8 ± 45.1 vs. 183.2 ± 60.9 min, $P \leq 0.001$; 162.8 ± 45.1 vs. 178.9 ± 50.9 , $P=0.01$) (CCT 97.6 ± 34.6 vs. 109.1 ± 39.2 min, $P < 0.001$; 97.6 ± 34.6 vs. 107.4 ± 36.8 min, $P=0.04$). Intensive care unit (ICU) length of stay was also significantly longer in groups 2 and 3 (2.1 ± 1.7 vs. 2.8 ± 4.0 days, $P=0.005$; 2.1 ± 1.7 vs. 3.2 ± 4.9 days, $P=0.001$). The overall rate of wound healing disorders was very low, accounting for only 0.8%, with no significant difference between groups. There were no recorded instances of stroke within the overall cohort. The re-thoracotomy rate in group 1 showed no significant difference compared to groups 2 and 3 (5.9 vs. 7.1%, $P=0.68$; 5.9 vs. 7.5%, $P=0.58$). Mortality rates were low in all groups and showed no significant difference (0 vs. 0.9%, $P=0.65$; 0 vs. 1.5%, $P=0.17$).

Conclusion: EMS can be safely performed in pre-obese and obese patients, with similarly favourable clinical and hemodynamic results. Despite prolonged cardiopulmonary bypass and aortic cross-clamp times, as well as longer stays in the ICU, the results remain consistent across both patient groups.



• FT 57

Improved Transfemoral Access by Shockwave Lithoplasty for a Transcatheter Aortic Valve Implantation: A Case Report

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Objective: We describe a case of complex access for transcatheter implantation of the EVOLUT R[®] aortic valve in which it was necessary to use the Shockwave[®] device to prepare the vascular beds for the passage of the transcatheter aortic valve implantation (TAVI) delivery system. This intravascular lithotripsy device, validated by the DISRUPT PAD III study, enabled us to maintain the femoral artery as the first choice in a case where access would not be possible due to intense calcification.

Methods: In a review of the literature in databases such as PubMed and SciELO, similar cases were found with successful results. This was the first case performed at the Hospital Beneficência Portuguesa de São Paulo, Unidade Paulista. Currently, and according to a report by Shockwave Medical, Brazil is close to completing 30 cases of the use of this technique associated with TAVI.

Case Report: A 68-year-old male patient exhibited significant aortic stenosis along with symptoms of heart failure New York Heart Association (NYHA) functional class III and 14 hospitalizations in the last year due to decompensation of the condition. In discussion with the heart team and the patient, the option for transcatheter treatment was defined due to multiple comorbidities and high surgical risk. The transthoracic echocardiogram showed an aortic valve area of 0.8 cm², a maximum systolic gradient of 33 mmHg, and an ejection fraction of 59%. Aortic angiotomography showed severe calcification of the iliac and femoral arteries, with minimum diameters of the right femoral of 4.9 mm and 4.4 mm on the left. Alternative accesses were evaluated, but the subclavian and carotid arteries had reduced diameters and stenotic areas. With the patient under sedation and local anesthesia, puncture of the left femoral artery was performed with the aid of vascular ultrasound and the contralateral iliac artery was catheterized with a hydrophilic guide, replaced by a V18 guide. An attempt was made to progress the Shockwave[®] sheath without success due to intense calcification and small vessel caliber. Due to an intensely calcified right femoral artery without visualization of the puncture site through ultrasound, a decision was made for dissection of the artery and puncture in a site free of calcifications, progressing the sheath and performing successful angioplasty with pulses of intravascular lithotripsy in the right common iliac, right external iliac and right common femoral arteries. A 29 mm EVOLUT R[®] prosthesis was successfully implanted following the usual technique. A control arteriography of the iliac and femoral arteries showed patency and no bleeding. Postoperative echocardiogram with satisfactory results demonstrated a maximum systolic gradient of 4 mmHg and a mean gradient of 2 mmHg. The patient was discharged showing improvement in functional class and adequate perfusion of lower limbs.

Conclusion: TAVI is a technique that initially came to allow the treatment of cases of aortic stenosis that were previously deemed untreatable. Aiming to maintain the femoral access as the first choice, the association of the intravascular lithotripsy device proved to be very useful, allowing the performance of TAVIs such as the one described in this case.



• FT 58

Late Outcomes and Quality of Life Following Percutaneous Myocardial Revascularization in Patients Aged 40 Years Old

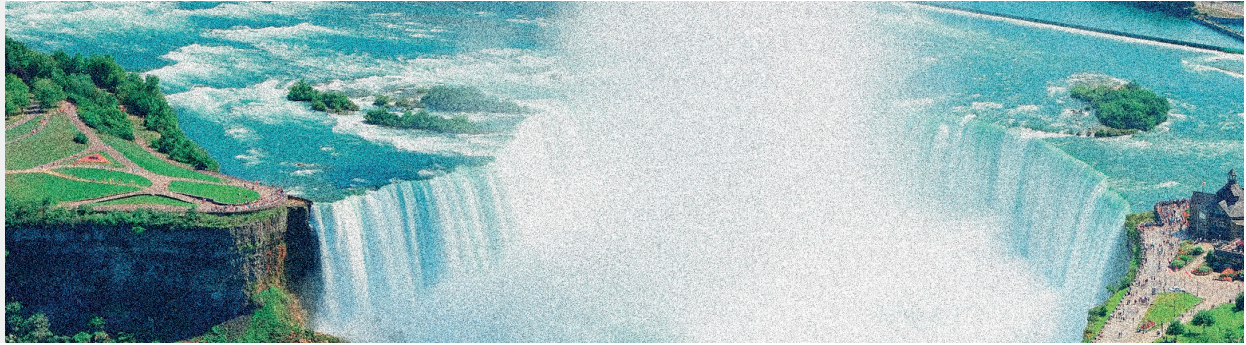
Fuad Abdullayev, Larisa Shikhiyeva, Nijat Babayev, Imadaddin Bagirov, Akram Mirzai

Objective: To analyze late outcomes and quality of life in patients who underwent percutaneous coronary intervention (PCI) in the age range of 35-40 years, according to age limit (35 vs. 36-40 years), as well as comparing outcomes between acute coronary syndrome (ACS) and stable angina (SA) groups.

Methods: A total of 208 consecutive patients with coronary artery disease (CAD) aged 24-40 years (36.9 ± 3), were enrolled in this study. Among them, 157 (75.5%) were aged 36-40 years, 51 (24.5%) were aged 35 years (32.5 ± 2.5). Out of the enrolled patients, 98 (47.1%) were admitted with ACS, and 110 (52.9%) with SA. The comparison between the ACS and SA groups showed that early myocardial infarction (MI) occurred in 23.5% and 36.4% of the patients, respectively. Among the patients, 197 (94.7%) underwent myocardial revascularization, of which 151 (76.6%) were aged 36-40 years, and 46 (23.4%) were aged 24-35 years. PCI was performed in 165 (79.3%) patients, 84 (50.9%) with ACS and 81 (49.1%) with SA. In addition, 32 (15.4%) patients underwent coronary artery bypass grafting (CABG), resulting in a PCI:CABG ratio of 5.2:1. Eleven (5.3%) patients refrained from revascularization, with 8 of them aged 36-40 years, and 3 were 35 years old. Among 151 patients aged 36-40 years, 129 (85.4%) underwent PCI, with 213 stents implanted (mean 1.6). A total of 22 patients (14.6%) in this subgroup underwent CABG. The PCI:CABG ratio in the group of patients aged 36-40 years was 5.8:1. Among the 46 patients aged 24-35 years, 36 (78.3%) underwent PCI, with 53 stents implanted (mean 1.5), while 10 (21.7%) underwent CABG, with a PCI:CABG ratio of 3.6:1. Out of the 266 stents used, 258 (97%) were drug-eluting stents (DES), and 8 (3%) were bare metal stents. Late outcomes of PCI and quality of life were studied in 126 patients (76.4%) during a monitoring period ranging from 10-107 months (62.5 ± 2.6).

Results: All PCI interventions were performed without any complications, resulting in a 0% hospital and 30-day mortality rate. The survival rate of patients on 9 years was 99.2%, with a long-term mortality of 0.8%; the event-free survival rates at 1, 2 and 3 years of follow-up were 90.5%, 84.1% and 81.7%, respectively, and at 5-9 years was 79.4%. An active lifestyle was verified in 74.6% of patients, while a sedentary lifestyle was observed in 25.4%. A significant number of patients (86.5%) returned to work. Transient sexual disorders were found in 28.6% of patients. Among the patients, 83.3% and 27.8% adhered to drug therapy and dietary regimen. Furthermore, 34.1% of patients continued smoking and 23.8%, consuming energy drinks. Overweight and obesity were observed in 23.8% and 19% of patients, respectively. Recurrent myocardial infarction (MI)/angina were verified in 23% of patients, and 20.6% underwent second-time PCI. Among the patients, 23% got depressed due to recurrent MI/angina, while 18.3% of patients felt down due to the quarantine measures during the Covid-19 pandemic. In addition, 6.3% suffered from panic attacks, due to the fear of recurrent angina.

Conclusion: Predictors for recurrent PCI and unstable late outcomes include: 1) ACS; 2) Age 35; 3) Acute and early MI, left ventricular ejection fraction 35-40%, diabetes mellitus (DM); 4) Stent diameter <28 mm; 5) Smoking and use of energy drinks. The most prominent predictor was the aggressive nature of atherosclerosis and DM in individuals aged 40 years old, causing stent dysfunction and lesion in native or "protected" coronary vessels, despite of stent patency.



• **FT 59**

Left Common Iliac Vein Angioplasty with Stent Placement for Treating May–Thurner Syndrome: A Case Report

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Introduction: May-Thurner syndrome results from the compression of the left common iliac vein anteriorly through the right common iliac artery and posteriorly by the vertebral body of the 5th lumbar vertebra. May and Thurner, in 1956, observed the decrease of the vascular lumen of this vein by the proliferation of its intima due to the pulsation of this artery located over the vein. In addition, Cockett and Thomas later observed a sequence of patients with deep vein thrombosis due to this syndrome. Advanced endovascular techniques proposed that the gold standard treatment is stenting, with access through the femoral vein.

Objective: This research aims to conduct a bibliographic review of this syndrome, expounding a case report of a patient affected by this disorder. Moreover, we aim to emphasize the possibility of venous compression in patients with pain and edema in the left lower limb, the presence of varicose veins, or venous thrombosis in this limb. Furthermore, our goal is to alert and include the investigation of stenosis in these patients.

Methods: Data collection was performed through the analysis of the medical record and angiography images retrieved from the Hemodynamic Service of São Lucas Hospital (HSL) in Cascavel-Paraná, Brazil, pertaining to a specific patient. This information was then correlated with literature found in databases such as PubMed and the book “Endovascular Surgery - 4th edition”.

Case Report: We present a case of a 44-year-old female patient on continuous treatment with levothyroxine sodium and acetylsalicylic acid and a history of thrombosis in the left lower limb in 2011. She presented pain and edema in the same lower limb, and an eco-Doppler revealed a systolic peak velocity coefficient at the intersection between artery and iliac vein greater than the standard threshold of 2.5, which may indicate stenosis in the left common iliac vein. Therefore, an arterial and venous angiotomography of the abdominal aorta and pelvis was performed, demonstrating the extrinsic compression of this vein by the artery, which led to the diagnosis of May-Thurner syndrome, but without any evidence of intraluminal venous thrombosis. The patient was submitted to surgical intervention by the Hemodynamics Service of HSL, on 07/17/2021. General anesthesia and a puncture of the left femoral vein were performed, followed by the passage of hydrophilic wire, the placement of a vertebral catheter, and subsequently, the insertion of the stent and post-dilatation with the balloon. Control angiography showed residual stenosis in the external iliac vein, with the need for implantation of a second supplementary venous stent, also with post-balloon dilation. A post-procedure angiography was realized, and all the endovascular material was removed by radioscopy.

Conclusion: This research concludes that May-Thurner syndrome is a reality that mainly affects women and that the proper treatment can prevent extensive problems such as deaths by stroke and provide relief of discomfort in the left lower limb. The strategy of angioplasty of the left common iliac vein with the implantation of a self-expanding stent, followed by a post-dilatation balloon, has a high success rate for treatment. The long-term results were positive and the patient was able to return to her daily activities without significant complications and with an improvement in quality of life through the complete reduction of symptoms.



• FT 60

Results and Feasibility of Occlusion Devices in the Endovascular Treatment of Structural Cardiovascular Diseases

Diego Maia Martins, Karlos Jenynsson Sousa Soares, Daniel Rodrigues Alves, Mauro Henrique Batista Camacho, Felipe Reale Cividanes, José Rogério da Silva, Daniel Robert Alexander, Igor Gomes Cristo, Enio Buffolo, José Honório de Almeida Palma da Fonseca

Objective: To evaluate the results and application of occlusion devices in structural cardiovascular diseases in different scenarios and settings.

Methods: From 2017 to 2022, 58 transcatheter insertion procedures of occlusion devices were performed, as follows: 7 cases of aortic endoprosthesis leakage, 3 cases of plug interposition for occlusion of paravalvular leaks, 14 cases of ventricular septal defect, 1 closure of patent ductus arteriosus, 18 cases of patent foramen ovale, 14 cases of atrial septal defect and 1 closure of aortic pseudoaneurysm. Delivery systems that varied in size were used according to the occlusion device specification. The most common access routes were the femoral arteries and veins, followed by the axillary, brachial and carotid arteries.

Results: The 30-day mortality was zero. There was one embolization, implanted for paravalvular aortic leak closure and captured with dedicated devices and catheters. Atrial and ventricular septal defects were the most common conditions, with favorable results, as several studies in the cardiovascular literature corroborate its use. Cases of endoleak in aortic prostheses were also corrected using plugs, with type 1 being the most common. Percutaneous closure of paravalvular leaks can be challenging; however, device success was obtained with adequate planning with transesophageal echocardiography and measurements through projections leading to correct implantation, noticing the absence of leakage or minimal residual flow. In a specific case, a thoracic aortic pseudoaneurysm leakage was corrected after the Bentall-De Bono operation, with satisfactory result. The intraoperative transesophageal echocardiography analysis was fundamental both in planning and placement of the occlusion device. No residual lesions were observed following device deployment.

Conclusion: The use of occlusion devices in transcatheter situations is highly valid and feasible, with the aim of safely resolve defects in both heart and aorta. The use of plugs should be encouraged, as it is less invasive and has doable reproducibility. Fostering development options for occlusion devices is fundamental, as promising in the endovascular treatment of structural diseases.



• FT 61 Structural Heart Diseases in Northern Brazil

Eduardo Menegat, Francisco Siosney Almeida Pinto, Valeria Santos de Jesus, Jose Renato Bravo Arero, Lucas Carvalho de Oliveira, Raiane Pereira, Arleto Zacarias Silva Junior

Objective: To report the evolution in the treatment of structural heart diseases in a center located in northern Brazil.

Methods: A descriptive, retrospective, observational study with patients treated at the Instituto Cardiovascular de Rondônia (Incardio).

Results: Between January 2019 and March 2023, a total of 72 patients underwent cardiac structural interventions, with ages ranging from 15 days to 90 years, of which 36% were women, and 41% were at high surgical risk (all undergoing transcatheter aortic valve implantation [TAVI]). The procedures were TAVI (28), endovascular aortic prostheses (15), transcatheter closure of atrial septal defect (20), perivalvular leak closure (4), transcatheter mitral valve-in-valve replacement (1), percutaneous occlusion of interventricular septal defects (1), percutaneous closure of patent ductus arteriosus (1), transcatheter mitro-aortic valve implantation (1), and pulmonary valvoplasty (1). The average length of hospital stay was three days, and the 30-day mortality was 7%. Among TAVI procedures, the need for permanent pacemaker implantation was 10,7%, and the prostheses used were Edwards (18), St. Jude (2) and Braile (8).

Conclusion: Like other centers, the use of less invasive means for the treatment of structural pathologies proved to be safe, effective, and reproducible in our center.



• FT 62

TAVR-in-TAVR to Treat a CoreValve Dysfunction with Shockwave Lithoplasty – Facilitated Transfemoral Access

Rodrigo Petersen Saadi, Ricardo Soccol, Ana Paula, Eduardo Keller Saadi

Objective: We present a case of a 91-year-old male patient who had previously undergone transcatheter aortic valve replacement (TAVR) with a CoreValve nine years ago. The patient presented with severe insufficiency of the valve and, due to the unsuitability of femoral access, an alternative approach was required. Herein, we describe the methods employed and the successful outcome achieved using shockwave therapy in the right iliac artery, followed by implantation of an S3 valve inside the existing CoreValve.

Methods: The patient, with a history of CoreValve implantation, was found to have severe valve insufficiency. Due to the absence of feasible femoral access, an alternative strategy was devised. The chosen approach involved shockwave therapy in the right iliac artery to facilitate access, due to severe calcification and tortuosity. A pigtail catheter was used to cross the previous valve, and a Lunderquist wire was positioned in the left ventricle. Subsequently, the S3 valve was implanted in node 5 of the Evolut Valve, with rapid pacing through the Lunderquist.

Results: The procedure was successfully completed without any complications. There were no blockages, electrocardiogram changes, or leakage observed during or after the S3 valve implantation. The patient remained hemodynamically stable throughout the procedure. Following the intervention, the patient was discharged just two days later.

Conclusion: In this case report, we describe a successful alternative approach for managing severe insufficiency in a 91-year-old patient with a previous CoreValve implantation and poor femoral access. By employing shockwave therapy in the right iliac artery and implanting an S3 valve within the existing CoreValve, we achieved an excellent result without any complications. This case highlights the potential effectiveness and feasibility of this approach in patients with limited access options and valve dysfunction. Further research and experience are warranted to confirm the generalizability of these findings and optimize patient selection and procedural techniques.



• FT 63

Utilization of a Vena Cava Filter in a Reference Hospital in São Paulo

Daniel Toimasi Keppen Sequeira de Almeida, Artur Dantas Freire, Rui Manuel de Souza Sequeira Antunes de Almeida, Filipe Tomasi Keppen Almeida, Angelo Keppen, Marcelo Calil

Introduction: Venous thromboembolism (VTE), which presents as deep vein thrombosis or pulmonary embolism (PE), is a condition that affects approximately 5% of the general population, being a severe and potentially fatal disease. The standard treatment for VTE involves full anticoagulation, using parenteral unfractionated heparin or low molecular weight heparin, followed by vitamin K antagonists or direct oral anticoagulants. In cases of contraindication for anticoagulant therapy, an inferior vena cava filter may be considered for patients with VTE or PE.

Objective: The objective of this study is to carry out an analysis of the epidemiological profile of patients and their indications, from April 2011 to March 2021, at Hospital Santa Marcelina, on vena cava filter implantation, as well as the rate of removal of this device.

Methods: We performed an observational, cross-sectional, and retrospective study with a qualitative methodological approach. The research was conducted at a quaternary hospital located in the east zone of São Paulo after approval by the Ethics and Research Committee. Inclusion criteria in the research encompassed patients who underwent inferior vena cava filter implantation procedure from April 2011 to March 2021 at the institution. Exclusion criteria involved patients who were not submitted to this procedure and those who underwent it in another period than described. The researched variables were sex, age, associated chronic diseases, and symptomatology.

Results: During the evaluated period, 118 inferior vena cava filters (IVCFs) were implanted; however, data from one patient were excluded due to non-consent. Hence, data from 117 patients who underwent the procedure and agreed to participate in the research were used. Most patients undergoing the procedure were female (68.4%), with a mean age of 57 years (ranging from 17 to 90). Of the total number of patients undergoing the procedure, 96.61% had some event of deep venous thrombosis (DVT), and 11.01% had pulmonary thromboembolism (PTE), of which 15% had massive PTE. Neoplastic diseases were present in 57.3% of the cases, showing an intimate relationship with VTE events. Optease was the most prevalent among the implanted devices, accounting for 67.79%. During the analyzed period, no IVCFs were removed, and no complications related to the procedure were observed.

Conclusion: The IVCF device can be used to prevent pulmonary thromboembolism. However, it should not be routinely performed, immediately at the risk of developing PTE, only when there is strong evidence for its use. Device implantation is safe, with no complications related to the vena cava filter. However, its removal was below expectations, either due to inadequate follow-up of the patient (from other institutions) or because the assistant team did not request the removal of the device after the procedure. In addition, it was possible to observe a strong association between patients with DVT and neoplastic conditions.



• FT 64

Totally Percutaneous Transaxillary Transcatheter Aortic Valve Implantation (TAVI) with Local Anesthesia: A Case Report

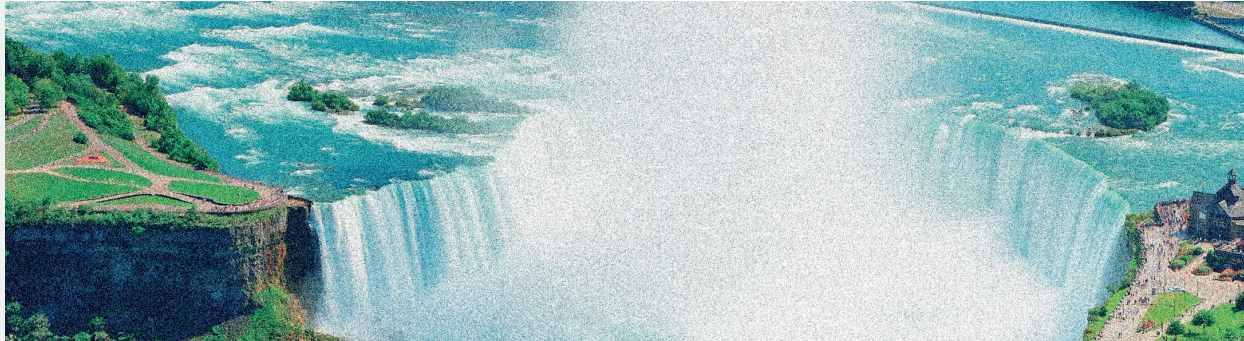
Rodrigo Petersen Saadi, Clara Krummenauer Maraschin, Ana Paula Tagliari, Eduardo Keller Saadi

Objective: We present a case report describing a successful totally percutaneous transcatheter aortic valve implantation (TAVI) procedure performed through the axillary artery under local anesthesia. The patient was a 78-year-old male with symptomatic severe aortic stenosis, who was deemed unfit for surgical repair due to comorbidities including severe emphysematous chronic obstructive pulmonary disease, and had no suitable femoral access. The procedure was performed using a 29 mm Navitor valve (Abbott Vascular).

Methods: A 78-year-old male with symptomatic severe aortic stenosis and severe emphysematous COPD, thus unfit to general anesthesia, was scheduled for elective TAVI. Computed tomography angiography (CTA) was performed to assess the annulus size, confirming compatibility with a 29 mm Navitor valve. Femoral access was not feasible due to severe stenosis and calcification, leading to the decision for a totally percutaneous transaxillary approach. The procedure was performed in a catheterization laboratory with the patient under local anesthesia and sedation. The left axillary artery was punctured echo-guided, and two Perclose ProGlide devices (Abbott Vascular) were precharged. After predilation with a 20 mm balloon, the 29 mm Navitor valve was implanted 3 mm below the annulus ring. Post-dilation was unnecessary as the valve had a good seal. The patient had a pre-existing left bundle branch block, seen on the electrocardiogram, which did not change during or after procedure. The axillary access was properly closed, and no covered stent was necessary.

Results: Following the TAVI procedure, the patient was admitted to the cardiac intensive care unit due to hypotension, which was successfully managed with low-dose noradrenaline. He remained hemodynamically stable, with no procedure-related complications. The patient was discharged on the first postoperative day with a recommendation for outpatient cardiac care.

Conclusion: The utilization of TAVI with the axillary artery as the entry site with local anesthesia and sedation is infrequently reported. In this case report, we demonstrated the safety and feasibility of a totally percutaneous transaxillary approach in a patient with severe aortic stenosis and contraindications for general anesthesia. The successful implantation of the 29 mm Navitor valve without post-dilation and the absence of complications highlight the potential of this approach in selected cases. Further research and broader clinical experience are needed to validate these findings and expand the understanding of optimal patient selection and procedural techniques for transaxillary TAVI.



• FT 65

Transient Paraplegia in a Patient with Descending Thoracic Aortic Ulcer Treated with Stent Graft: A Case Report

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Introduction: Descending thoracic aortic ulcer is a rare condition characterized by an erosion of the aortic wall, which can lead to serious complications such as intramural hematoma formation, aortic dissection, and even rupture. Conventional treatment of this condition usually involves open surgery with replacement or repair of the affected aorta. However, with the advancement of endovascular medicine, the use of aortic stents has proven to be a less invasive alternative with good results.

Case Report: A 65-year-old female patient with a history of systemic arterial hypertension and cigarette smoking was admitted to our service complaining of severe chest pain of sudden onset. Chest angiotomography revealed the presence of a penetrating ulcer in the descending thoracic aorta, associated with a small adjacent intramural hematoma. The patient underwent placement of a thoracic aortic stent graft (GORE® TAG® No. 26). The procedure was successfully performed, resulting in immediate relief from chest pain. Approximately 24 hours after the intervention, the patient developed sudden paraplegia, accompanied by bilateral sensory deficit in the lower limbs. A magnetic resonance imaging scan of the spine was conducted, revealing extensive spinal cord edema, especially in the thoracic region. After discussion, it was decided to perform a therapeutic cerebrospinal fluid (CSF) puncture to reduce the spinal cord edema and improve neurological symptoms. The CSF analysis revealed increased pressure and a mild lymphocytic pleocytosis. Soon after the procedure, the patient showed a gradual improvement of neurological symptoms, with complete recovery of muscle strength in the lower limbs in about 48 hours. Paraplegia is a severe and rare complication following thoracic aortic stent graft implantation. Although its exact incidence varies in the medical literature, estimates range from about 2% to 5% of cases. Several mechanisms have been proposed to explain this complication, classified into ischemic and nonischemic factors.

Conclusion: Paraplegia is a rare but serious complication that can occur after thoracic aortic stent graft implantation. Although its exact incidence is variable, it is essential to recognize the risk factors and underlying mechanisms to appropriately prevent and treat this complication.



• FT 66

Acute Thrombosis of Bioprosthetic Mitral Valve Following the Use of Ventricular Assist Device: A Case Report

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Objective: To describe a safe and effective therapeutic option for managing acute mitral bioprosthesis thrombosis following the use of a ventricular assist device.

Methods: We report the case of a patient who underwent mitral valve replacement with a biological prosthesis who required postoperative left ventricular circulatory support and developed bioprosthetic valve thrombosis.

Case Report: A 41-year-old female patient diagnosed with rheumatic fever in adolescence underwent mitral commissurotomy at the age of 23. Over the past year, she began to experience increasing fatigue and dyspnea. Transthoracic echocardiogram (TTE) evidenced double mitral valve lesion with a predominance of stenosis, being referred for surgery. A PERIMOUNT Magna Ease bovine pericardial prosthesis no 29 was implanted, along with exclusion of the left atrial appendage. Cardiopulmonary bypass (CPB) time was 75 minutes and aortic cross-clamp time was 56 minutes. An intraoperative transesophageal echocardiogram (TEE) showed no abnormalities. However, on the first postoperative day, the patient had life-threatening ventricular arrhythmia, with hemodynamic instability. Usual measures (volume expansion, inotropes) had little effect. A TTE showed evidence of diffuse left ventricular hypocontractility with an estimated left ventricular ejection fraction of 40%, with septal hypokinesia. A left ventricular assist device (CentriMag, Abbott) was indicated in the first postoperative day, and CPB was established for 45 minutes to install a venous cannula in the left atrium and an arterial cannula in the ascending aorta, interposed with a 10 mm Dacron tube. Daily laboratory tests showed transient liver dysfunction, international normalized ratio (INR) >2 and thrombocytopenia, leading to the decision to remain without anticoagulation. After the 7th day of ventricular assist device support, the removal of the device was indicated based on clinical and echocardiographic evolution. During the weaning from CPB, TEE showed a preserved biventricular function, however, a thrombus was observed on the ventricular side of the mitral prosthesis, with a mean gradient of 22 mmHg. Given the context of clinical improvement, hemodynamic stability, and renal dysfunction, anticoagulation with unfractionated heparin in a continuous infusion was instituted. After 12 days, the vitamin K antagonist oral anticoagulant, Marevan 5 mg, was introduced. During the first week after starting anticoagulation, TTE was performed every 48 hours, with evidence of reduction of gradients in the mitral bioprosthesis. Thus, therapy was maintained.

Results: After 6 months of follow-up, the patient remains clinically stable, maintaining her usual daily activities. TTE showed a well-positioned mitral bioprosthesis, with preserved opening and minimal central insufficiency, a mean diastolic gradient of 5 mmHg and preserved biventricular systolic function.

Conclusion: Acute thrombosis of a mitral bioprosthesis, whether during or following the use of a ventricular assist device, is a rare complication. However, when detected early and properly treated, results are favorable to the patient. The option of anticoagulation in hemodynamically stable patients proved to be a safe and effective therapeutic option.



• FT 67

Did the Etiological Profile of Heart Transplants at a Brazilian Public University Hospital Change Due to the COVID-19 Pandemic?

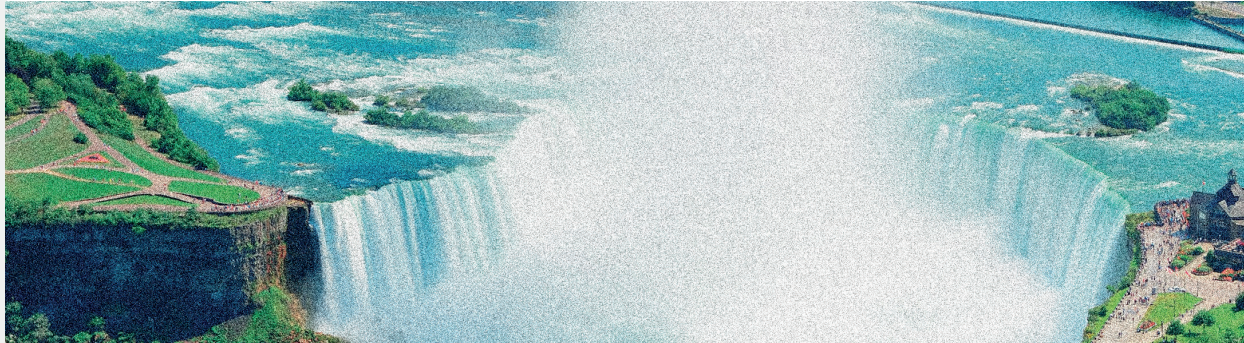
Moisés Barbosa de Andrade, Gabriela Zamunaro Lopes Rui, Bianca Ituassu Mapa Nonato Vicente Gallo, Davson José Bergamaschi Souza Costa, José Henrique de Oliveira e Oliveira, Gabriel Rodrigues Bittencourt, Ricardo Lage Guerra Lott Pires, Cláudio Léo Gelape, Renato Bráulio, Maria do Carmo Pereira Nunes

Objective: The purpose of this study is to determine whether the etiological profile of patients who underwent heart transplant at a public university hospital in Brazil, between 2017 and 2022, suffered any change due to the COVID-19 pandemic.

Methods: This is a cross-sectional study that analyzed the institution's cardiovascular surgery database, which included clinical information collected from medical records of the patients who underwent heart transplantation (HTx) between 2017 and 2022. We created a research protocol to collect relevant clinical data from the patients. All patients that received a HTx within the hospital and that had their clinical data collected were included into the database. A total of 117 patients were included and further divided into group 1, representing the pre-pandemic years of 2017, 2018, and 2019, and group 2, representing the pandemic years of 2020, 2021, and 2022. The pre-pandemic group accounted for 67 patients, while the pandemic group accounted for 50 patients. We looked into their clinical records to determine their etiological factors for HTx. The main cardiac disease etiologies were: idiopathic cardiomyopathy (ICM), Chagas cardiomyopathy (CC), ischemic heart disease (IHD), valvular heart disease (VHD), and other causes of cardiac disease (OCs). Other causes included: congenital heart disease, myocarditis, amyloidosis, retransplantation, hypertrophic cardiomyopathy, restrictive cardiomyopathy, familial neuromuscular cardiomyopathy, and postpartum cardiomyopathy.

Results: After analyzing the data, we were able to observe that the general configuration of etiologies at our institution remained unaltered. In both groups, CC prevailed as the main indication of HTx, with 40.3% in group 1 and 64% in group 2. ICM consistently ranked second in both periods, with 26.86% and 14%, respectively. IHD varied within the groups, being the third most common cause in group 1, with 17.91%, and fourth in group 2, with 10%. OCs also varied during both periods, coming in fourth in group 1, with 10.45%, and third in group 2, with 12%. VHD came in last in both groups, with 4.48% and 0%, respectively. We further analyzed the percentage changes in each etiology. CC suffered a 23.7% increase, while OCs perceived a slight 1.55% increase. Meanwhile, IHD decreased 7.91%, ICM decreased 12.86%, and VHD decreased 4.48%. It is also important to emphasize that during the first year of the pandemic, the total number of HTx decreased, but the number of HTx performance in an emergency setting increased.

Conclusion: Our results show that the etiological distribution of diseases leading to HTx were similar to the etiologies reported in the literature. The pandemic of COVID-19 did not seem to exert a significant influence in the etiological profile of our service, since the general trend of etiologies kept the same. The main etiology in our institution during the studied period was CC. These results call our attention to the ongoing importance of Chagas cardiomyopathy within our regional context. We further acknowledge that the number of patients in this study is low and thus may not fully reflect the nation's epidemiology. However, it serves our purpose of analyzing the impact of the COVID-19 pandemic in our institution.



• FT 68

Outcomes of Patients Undergoing Heart Transplantation in Brazil (2012–2022): Epidemiological Evaluation and Possible Correlations with the COVID–19 Pandemic

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Objective: The aim of this study was to evaluate the mortality rate and complications after heart transplant from 2012 to 2022 and the possible influence of the coronavirus pandemic on these results.

Methods: A retrospective cross-sectional cohort study was carried out using information from the Brazilian Unified Health System's Hospital Information System (SIH/SUS), contained in the database of the Informatics Department of the Unified Health System (DATASUS). Data was collected regarding the total number of treatments of complications after heart transplant, as well as the total number of deaths and mortality rate resulting from those complications, between 2012 and 2022, in the years before the pandemic (2012-2019) and during the COVID-19 pandemic (2020-2022). After collecting the information, an analysis of the correlation between the variables was carried out using Pearson's correlation coefficient, whose significance was verified using Student's t-test. Such analysis took place through the PSPP free software system. The established significance level was 5%.

Results: From 2012 to 2022, there were a total of 3,811 treatments for complications from heart transplant, and 138 deaths after those procedures. The average mortality rate was 3.62% (138/3,811). During this period, there was a trend towards an increase of the number of hospitalizations per year ($r = 0.934$; $P < 0.001$) and deaths per year ($r = 0.785$; $P = 0.004$), but a downward trend regarding the yearly mortality rate ($r = -0.739$; $P = 0.009$). By comparing the periods 2012-2019 and 2020-2022, amounting to 2,312 and 1,499 procedures respectively, we found that the average mortality rate was 3.94% (91/2,312) and 3.14% (47/1,499), respectively.

Conclusion: During the pandemic period, there was a decrease of the mortality rate when compared to the 2012-2019 interval. This reduction could be related to the underreporting of complications of heart transplant patients, once most non-COVID-19 related diseases were neglected during this time. In the course of an infectious pandemic, it would be expected an increase of hospital infections in immunocompromised patients and, as a result, a rise in the mortality rate, which, however, was not observed in the data from the Department of Informatics of the Brazilian Unified Health System (DATASUS). This scenario is most likely linked to the implementation of recently published guidelines that are being disclosed in the area, and it highlights the need for constant updates in postoperative care and techniques. In addition to these circumstances, the reevaluation of patient medical reports is extremely important to improve notification protocols and to allow better epidemiological surveillance for transplanted patients in the Brazilian Unified Health System. Finally, more research is needed to clarify the correlations between the COVID-19 pandemic and the outcomes of transplanted patients.



• FT 69

Research and Development of Ventricular Assist Devices from a Single Center in Latin America

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Objectives: Ventricular assist devices have been widely accepted as an alternative treatment for advanced heart failure, while heart transplantation is a limited procedure because of the shortage of donors. In face of a scarce availability of these devices, many centers around the world have developed their own technologies. The Institute Dante Pazzanese of Cardiology holds a dedicated engineering center for mechanical circulatory support, being responsible for creating several prototypes and notable devices, like the first Brazilian artificial heart. The objectives of this study were to provide both a historical overview and a detailed characterization of each original device developed by the center.

Methods: We describe historical and technical features of the main ventricular assist devices developed at the Institute Dante Pazzanese of Cardiology through a focused review on the institute's scientific and technical production on ventricular assist devices or blood pumps, from 1990 to 2022, indexed in the electronic databases Latin American and Caribbean Health Sciences Literature (LILACS), PubMed, and the Scientific Electronic Library Online (SciELO).

Results: The following devices were selected from the review: (1) The Spiral Pump is a disposable centrifugal pump with an internal conically shaped rotor, a spiral impeller, which carries threads on its surface. The device was designed for cardiopulmonary bypass in 1992, passed through consecutive design modifications and preclinical tests until approval for clinical application in 2007. (2) The Auxiliary Total Artificial Heart is an electromechanical pulsatile blood pump with left and right chambers, originally designed in 1995 to work as a heterotopic artificial heart. Preclinical studies evaluated hydrodynamic performance in mock circulatory loops and *in vivo* implants were performed in calves from 1999 to 2009. In 2012, it became the first nationally conceived artificial heart approved for clinical trials in Brazil. (3) The Implantable Centrifugal Blood Pump was conceived in 2006 for long-term circulatory assistance with a unique impeller design concept producing a mixed flow. Preclinical studies included hydrodynamic and hemolysis tests, analysis in a hybrid cardiovascular simulator and anatomical positioning in calves. (4) The Apico-Aortic Blood Pump consists of a miniaturized centrifugal pump originally conceived in 2012 for bridge to transplantation strategy. Preclinical studies included hydrodynamic and hemolysis tests, analysis in a hybrid cardiovascular simulator and anatomical positioning in pigs. (5) The Temporary Circulatory Support Device is a new centrifugal blood pump for temporary ventricular assistance developed with the purpose of bridge to decision or bridge to recovery strategies. Originally conceived in 2013, preclinical studies on the device consisted only of hydrodynamic and hemolysis tests.

Conclusion: From the academic point of view, Brazil count on a few groups with a considerable output in ventricular assist device research and development. Notable devices produced at Institute Dante Pazzanese of Cardiology, from a total artificial heart to varied and innovative centrifugal pumps, have demonstrated excellent results for future clinical applications. More financial and institutional support are needed for the continuation of these promising research projects.



• FT 70

Survival of Patients with Hypertrophic Cardiomyopathy Carrying Implantable Cardioverter-Defibrillator

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Objective: To analyze the prognosis of patients with hypertrophic cardiomyopathy (HCM) who have undergone implantable cardioverter-defibrillator (ICD) placement.

Methods: This is an integrative literature review using the PubMed database for the period between 2018 and 2023. The search focused on English-language articles using the descriptors "Implantable Cardioverter Defibrillator", "Cardiomyopathy, Hypertrophic", and "Prognosis", with the Boolean operator "AND". Based on the specified criteria, 5 articles were selected out of the 35 found.

Results: HCM, the most common genetic cardiovascular disease, is characterized by cardiac dysfunction resulting from hypertrophy, fibrosis, and muscular disarray, which generate an arrhythmogenic substrate. For a long time, it was characterized by having an ineffective treatment with a disastrous clinical course. Currently, due to therapeutic advancements, it has become a manageable condition. One of the treatment options is the ICD, which has significantly altered the prognosis of sudden death (SD) in HCM by reducing mortality by a factor of 10, from 6% in the pre-ICD era to 0.5% per year. By preventing potentially lethal ventricular tachyarrhythmias, ICDs facilitate primary prevention and the development of a clinical risk stratification algorithm capable of recommending its implantation when one or more risk markers associated with SD, such as fibrosis and apical left ventricular aneurysm, are present. However, this algorithm has low sensitivity for SD prevention when analyzed in healthy patients with a heterogeneous hereditary disease like HCM. Possible deleterious effects related to the use of ICD are infrequent; when reported, consist of inappropriate shock discharges due to atrial fibrillation, recurrent ventricular tachyarrhythmias, and device-related infections.

Conclusion: The cornerstone of current HCM management is the ICD, which is a long-term therapeutic arsenal with greater long-term efficiency. Prophylactically, its use in patients with HCM is of utmost necessity, aiming to reduce SD, especially in patients with ventricular arrhythmias. Primary prevention therapy with ICDs is considered a life-saving measure, offering greater survival compared to other acquired heart diseases. In terms of life expectancy and quality of life, implants are considered cost-effective when compared to saved lives and provided benefits. Considering the importance of the ICDs, when compared to studies over the years, there is little information available on the prognosis of patients under treatment, which indicates a lack of research on this method of primary prevention for HCM.



• FT 71

Use of Extracorporeal Membrane Oxygenator in Post-Cardiotomy Patients: Results at an Adult Cardiac Surgery Center

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Introduction: Post-cardiotomy cardiogenic shock is an infrequent but severe complication after cardiac surgery. Extracorporeal membrane oxygenator (ECMO) is an option for these critically ill patients when conventional treatments failed, especially in countries with no other assist devices.

Objective: The aim of this study was to analyze the results of patients who underwent cardiac surgery and required mechanical circulatory support with ECMO and compared them with another group of patients assisted for other indications.

Methods: This is a retrospective review of 88 consecutive ECMO runs between 2014 and 2023 at an adult cardiac center. Preoperative data, indications and postoperative results were analyzed.

Results: Two patients assisted with veno-venous ECMO were excluded from the analysis. The study focused on 86 veno-arterial ECMO (VA ECMO) cases. Among these, 49 runs (56.9%) were implemented in the immediate postoperative course for post-cardiotomy cardiogenic shock (31 [36%] post-cardiotomy patients and 18 [21.4%] post-transplant primary graft failures – Group 1) and the other 37 (43%) for other cardiogenic shock causes (myocardial infarction, 6 [7%]; acute decompensated chronic heart failure, 23 [27%], electrical storm, 2 [2.38%], and cardiac arrest, 6 [6.9%] – Group 2). There were 13 (15%) CPR ECMO, 92% of them in Group 2 ($P<0.001$). Mean age was 53.4 ± 13.1 years, 57.2 ± 11.7 in Group 1 and 48.5 ± 13.3 in Group 2, $P=0.001$. ECMO strategy was bridge to transplant in 22 patients (25.58%) (4 [8.1%] in Group 1 and 18 [48.6%] in Group 2); bridge to recovery in 57 patients (66.2%) (43 [87.7%] in Group 1 and 14 [37.8%] in Group 2) and bridge to decision in 7 (8.14%) (2 [4%] in Group 1 and 5 [13.5%] in Group 2 [$P<0.001$]). Peripheral cannulation was implemented in 73 runs (84.8%), (38 [77.5%] in Group 1 and 35 [94.5%] in Group 2, $P=0.03$). Sixty-five ECMOs (83.3%) were implemented in INTERMACS 1, with no differences between groups. Ninety percent of patients had an intra-aortic balloon pump on ECMO as decompression strategy ($P=NS$ between groups). In 17 patients (20%), we used a vent for severe left ventricular distension treatment (12,2% in Group 1 and 29,7% in Group 2, $P=0,04$). Median time on ECMO was 7.7 ± 5.9 days (6.7 ± 4.6 days Group 1 vs. 9.1 ± 7.0 days in Group 2, $P=NS$). Most common complications were: surgical cannulation bleeding in 30 patients (37.9%) (20 [43.4%] vs. 10 [30.3%], $P=NS$); thromboembolic complications in 38 patients (46.9%) (21 [44.6%] vs. 17 [50%], $P=NS$); distal leg ischemia in 18 (21,9%) (10 [21.2%] vs. 8 [22.8%], $P=NS$) and infections in 42 (51,8%) (23 [50%] vs. 19 [54.2%], $P=NS$) for Groups 1 and 2, respectively, with no differences between them. Forty-eight patients (58.5%) could be explanted and survived ECMO assistance (27 patients [58.7%] in Group 1 and 21 patients [58.3%] in Group 2, $P=NS$). In-hospital survival was achieved in 39 patients (45.3%) (23 patients [46.9%] in Group 1 and 16 [43.2%] in Group 2, $P=NS$).

Conclusion: ECMO assistance is an effective treatment for patients with cardiogenic shock, both in the post-cardiotomy setting or for other indications. In-hospital mortality was similar to that reported by ELSO, and in post-cardiotomy group, described in the literature as patients with poorer outcomes, in-hospital survival was as good as non-post-cardiotomy patients. In these severe ill patients with a very poor prognostic without assistance, case selection by an ECMO Team is needed for better results.



• FT 72

Building a Low-Cost Simulator for Coronary Anastomosis Training

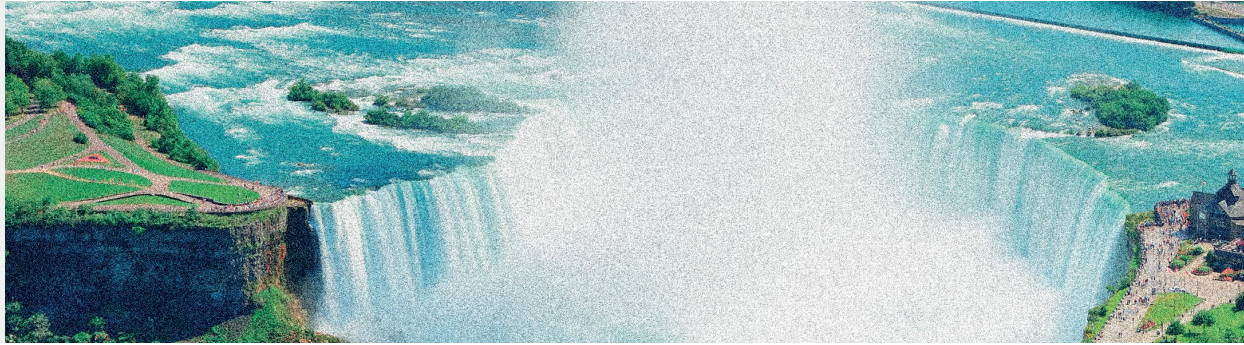
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Objective: The recent change in the Brazilian cardiovascular surgery residency program with direct access, without a general surgery formation, brought new challenges to the training surgeons. This new format created the need to teach basic concepts of handling clamps and performing surgical anastomosis. So, a new dichotomy was created, as trainees must develop never done surgical abilities while executing an already delicate procedure. The option to create surgical skills during surgery, especially coronary anastomosis, even though proven effective, exposes the patient to a longer surgical time with suboptimal results. Therefore, alternative paths must be created to ensure a safe learning space. While using animal parts is another option, the need for constant preservation of these specimens, combined with the modern tendency to avoid animal-related training, poses challenges. Understanding that coronary anastomosis is a core ability that every surgeon must develop, we aim to create a low-cost and low-fidelity simulator that can be built with widely available materials, so a residence program can provide simulated procedures to enhance the training of its residents.

Methods: Utilizing only materials available at Brazilian Amazon.com, we used a transparent shoe box to simulate the thoracic surgical field. An ellipsis-shaped incision measuring 10x5 inches was made in the box lid as a thoracotomy incision. We added a wooden board inside the box to create a stable field to fix two third-hand alligator clips on opposing sides and set them with double-sided adhesive tape. To simulate the coronary vessel and the bypass graft, we used a deflated 160Q-modeling balloon with an 8-French suction catheter inside to keep the structural rigidity. One or two sides of one of the balloon can be attached to the alligator clips, and the coronary anastomosis is then performed with a 7-0 polypropylene suture, following the routine of the surgical service. The simulator allows the resident to perform different techniques, such as end-to-side, side-to-side, and end-to-end anastomosis, according to the needs of the trainee.

Results: We built the simulator with no effort, and the total cost was 28.76 USD. The main expenses were \$9.12 for the plastic transparent shoe box, \$8.22 for each third-hand with alligator clips, \$3.00 for the adhesive tape, and \$0.20 for the suction catheter. The material cost to allow a single simulation is 5.69 USD, since the material cost is \$0.09 per balloon and \$5.60 per polypropylene suture line. The cost of the surgical material was not included due to its availability in the hospital. The finalized simulator proved a reliable structure with good stability, quick setup and easy portability. Even aimed to be a low-fidelity simulator, due to the lack of cardiac structures, the modeling balloons proved to replicate the coronary and graft textures, reproducing the natural feeling of the suture.

Conclusion: A fully functional coronary anastomosis low-cost simulator can be developed with readily available online materials. Even with low fidelity of a natural surgical field, the model successfully provided a training space where residents could develop essential surgical skills, with a very accessible price, excellent mobility, and zero patient risk. Training in a controlled area could improve the resident's confidence in performing such techniques in real patients, decreasing the length of the anastomosis, and enhancing future surgical outcomes.



• FT 73

Construction and Surgical Training in Coronary Anastomosis on a Low-Cost, Portable Simulator: Experience in a Peruvian Multicenter Study

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Objective: Several factors have led to the operating room no longer being the ideal place for early surgical training of cardiothoracic surgery residents in Latin America, forcing the search for simulation-based learning options. The aim of our study was the construction and surgical training in coronary anastomosis in a portable, low-cost, homemade simulator.

Methods: An observational, analytical, and multicenter study. The simulator was constructed with common materials (\$9.75) and was evaluated with the modified Objective Structured Assessment of Technical Skills (OSATS). All junior (1st, 2nd, and 3rd year) and senior (4th and 5th year) residents from 9 national cardiothoracic surgery centers were considered over a 90-day period in 2022. Operative skill acquisition and time taken for creating side-to-side (STS), end-to-side (ETS), and end-to-end (ETE) coronary anastomosis were evaluated. All sessions were recorded and subsequently evaluated by a single senior cardiothoracic surgeon during two time periods: first period (FP, 45 days) and second period (SP, 45 days).

Results: A total of 140 residents, with a mean age of 29.16 years, were assessed in 270 sessions (4,904 minutes). Among junior residents (55.71%), a significant improvement in final scores was identified in STS (involving the use of Castroviejo needle holder, needle angles, and needle transfer), ETS (involving graft orientation, appropriate spacing, use of Castroviejo needle holder, and needle angles), and ETE (involving the use of Castroviejo needle holder and needle transfer) anastomoses ($P<0.05$). Among senior residents (44.29%), similar improvements were observed for STS (involving graft orientation, appropriate spacing, use of forceps, angles, and needle transfer), ETS (involving graft orientation, appropriate suture bite, appropriate spacing, needle angles and needle transfer, suture handling, and tension) and ETE (involving graft orientation, appropriate spacing, use of Castroviejo needle holder, use of forceps, angles, and needle transfer) anastomoses ($P<0.05$). A significant improvement in the final anastomosis time of senior over junior residents was identified in STS (8.11 vs. 11.22 minutes), ETS (7.93 vs. 10.10 minutes), and ETE (6.56 vs. 9.68 minutes) ($P=0.039$).

Conclusion: Our portable and low-cost coronary anastomosis simulator has been shown to be effective in improving operative skills among Peruvian cardiothoracic surgery residents after 270 sessions (90 days). Current evidence suggests that skills acquired through simulation-based training transfer have a positive impact on the surgical environment.



• FT 74

Direct Access to Cardiovascular Surgery Residency Program: Analysis of the Psychic Morbidity Profile of Medical Students as a Predisposing Factor for Mental Disorders During Residency

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Introduction: In 2018, the Brazilian cardiovascular surgery residency program changed its access requirements, eliminating the need for a general surgery specialty as a prerequisite. This change altered the profile of residents entering the cardiovascular surgery program, as they can now start directly from the university environment, bringing different needs and specificities from those who have already completed another residency program.

Objective: The present study aims to analyze the psychological profile of medical students, assessing their susceptibility to develop shared mental disorders and mental distress. These elements predispose factors to develop prevalent mental disorders such as generalized anxiety disorder and major depressive episodes, which can contribute to consolidating the “individual” pillar of the classic triad seen in burnout syndrome, a highly prevalent psychological pathology within medical residency programs. The implications of Burnout syndrome are notably adverse, leading to negative impacts on both productivity and the learning experience during specialization.

Methods: This quantitative and cross-sectional study involved medical students enrolled in a private university center in the western region of Paraná state, Brazil, with approximately 1,300 students. The Self-Reporting Questionnaire (SRQ-20) was applied to this population. This tool is composed of 20 questions with “Yes” or “No” answers, aimed at screening for common or minor mental disorders (CMD/MMD). The test analyzes the following significant areas: depressive-anxious mood, somatic symptoms, decreased vital energy, and depressive thoughts. The result is an individual score ranging from 0 to 20, with seven or more positive responses classifying the individual as an inclined subject to mental disorder. All data collected was submitted to the Research Ethics Committee.

Results: A total of 847 medical students responded to the questionnaires. Non-respondents included students absent on the day of application or those who declined to participate. The distribution of respondents was as follows: 38.72% (328) from the 1st to the 2nd year (Basic period), 40.37% (342) from the 3rd to the 4th year (Clinical period), and 20.89% (177) from the 5th to the 6th year (Internship period). After analyzing the overall scores, it was found that 53.60% (454) of the students had a score ≥ 7 , indicating mental distress and a higher probability of mental disorders.

Conclusion: Based on research findings, over 50% of medical students are currently experiencing mental distress, with a high percentage still observed in students in the last two years of their course. This data is relevant for those entering cardiovascular surgery residency, as these two years is a transitional period before specialized medical service. Understanding this profile is crucial, as it can negatively impact the quality of life and lead to conditions like burnout syndrome, which primarily affects doctors during residency. Identifying and treating mental distress is essential for improving individual quality of life, preventing further suffering, and enhancing performance during medical specialization.



• FT 75

Medical Education in Brazilian Medical Schools: Different Methodologies for Enhancing Learning of Cardiovascular System Physiology and Anatomy

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Objective: The aim of this study was to showcase the various methodologies that higher education professors have adopted to make the content on cardiovascular system physiology and anatomy more didactic and comprehensible for medical students. The tested hypothesis addresses that the applied methodologies are fostering greater interest and learning among the students.

Methods: For this study, an exploratory research of qualitative nature was conducted, utilizing bibliographic research. Studies investigating teaching techniques related to these two fundamental areas of medicine were included.

Results: Cardiovascular physiology and anatomy taught in various health courses are still perceived as complex and challenging for a significant portion of students. However, there is an evident shift in the pedagogical approaches employed by professionals in this field. Methodologies related to functional and anatomical learning are gaining more prominence among various medical institutions in Brazil. The adoption of more active methods that effectively represent the systems and their components in the human body, such as the circulatory system, through robotic education with techniques employing pumps to simulate the heart, lights to represent blood vessels, using distinct colors for veins and arteries, promotes interactive and dynamic learning, providing a comprehensive understanding of the human circulation process. The use of dissected specimens is also crucial, as it allows for hands-on manipulation of the structures that constitute the cardiovascular system, generating greater interest and curiosity due to their closer resemblance to real characteristics, something limited in textbooks and traditional methods relying solely on colored images. Additionally, virtual technological models can be employed to enhance teaching, such as the use of 3D images that provide clearer and more objective visualization of bodily structures, rendering them more accessible to diverse audiences and facilitating better understanding, given that virtual simulations closely resemble reality. Another examined method was the use of instructional sequences, involving a systematic and organized approach to content, incorporating practical and playful activities, including games, animations, and interactive tasks that foster students' knowledge construction. Likewise, the construction and use of didactic models promote experiential and objective learning, integrating reflective and action-oriented aspects in knowledge creation and production.

Conclusion: This research indicates that employing diverse methodologies stimulates students' learning capacity more effectively, rendering the study of the cardiovascular system more efficient. These activities allow for a more proactive engagement, proving to be more motivating and satisfactory, consequently facilitating greater comprehension and assimilation of the covered content. Consequently, the utilization of robotic education, dissected specimens, virtual technologies, instructional sequences, and didactic models collectively contribute to an innovative education, adequately preparing students for clinical practice.



• FT 76

Evolution of the São Paulo Registry of Cardiac Surgery (REPLICCAR) to the Cardux Database: A Prototype for Value Generation in LATAM

Bianca Maria Maglia Orlandi, Gabrielle Barbosa Borgomoni, Camila Perez de Souza Arthur, Omar Asdrúbal Vilca Mejia

Introduction: The virtuous cycle of quality in cardiac surgery initiates implementing a comprehensive database. This foundation serves as a platform for the creation of strategies that direct the continuous improvement of results, even for increasingly severely ill patients. Although we have good results in the Latin American context, these findings are isolated and need to bring representative information that characterizes the region. It is challenging to propose cost-effective quality initiatives in this scenario.

Objective: This study aimed to implement Cardux, an accessible, easy, intelligent, and secure database based on the REPLICCAR experience.

Methods: From 2013 to 2019, over 12,000 patients from 12 centers were systematically enrolled in a structured, prospective and sequential approach in the São Paulo Registry of Cardiac Surgery (REPLICCAR). The REPLICCAR platform adapted the same variables and definitions as the STS Adult Cardiac Surgery Database. However, the extensive data collection forms made the task quite complex, with a high chance of errors. With the support of Harvard University, we carried out direct and indirect quality audits on the participating institutions to assess the original records due to the observational nature of data collection. The variables with the best performance served as the basis for constructing the Cardux Database (BD Cardux) starting in 2020. From November 2022 to January 2023, we performed the first tests of the prototype. Three researchers from two different institutions participated in the validation test. We evaluated factors related to completion time, user experience (tediousness/practicality), and overall usability.

Results: The platform resulted in approximately 150 perioperative variables distributed across ten screens with the primary forms. These variables not only demonstrated to be easy and have good adherence but also were considered sufficient for representing the results of coronary artery bypass grafting and valve surgery in our setting. The data reconciliation algorithms to ensure the quality and consistency of the included records are an excellent differential for Cardux, which will be able to implement the data culture gradually but safely for its users.

Conclusion: The first tests of the platform were carried out with the inclusion of 10 patients and demonstrated agility and practicality for use, excellent performance, speed, and comfort for navigation through the screens. Furthermore, the database maintains an administrative area for limited user control and secure information storage.



• FT 77

Heart Failure: An Overview of the Number of Hospitalization and Mortality Rates in Paraná Compared to Brazil in the Period from 2018 to 2022

Gabriela Carolina Baggio, Eduarda Elsenbach Scherer, Maria Eduarda de Quadros Batistello, Dânia de Camargo Lealdini Mantovani, Giulia Pietreski Padilha, Carolinne Cristina Capelli, Rui Manuel de Sousa Sequeira Antunes Almeida

Objective: The purpose of this study is to assess and compare the number of hospitalizations and the mortality rates due to heart failure (HF) in Brazil and the state of Paraná, by highlighting what is essential and analyzing the differences between this state and the rest of the country in the period from 2018 to 2022.

Methods: This ecological study exposes the mortality rate and number of hospitalizations related to HF in both Brazil and the state of Paraná. During the study, six tables taken from the Department of Informatics of the Brazilian Unified Health System (DATASUS) were analyzed, focusing on yearly data in the period from 2018 to 2022, and finally, the five years together. Data regarding hospitalizations and mortality rates were taken from the Hospital Information System of the Brazilian Unified Health System (SIH-SUS) and the Mortality Information System of the Brazilian Ministry of Health (SIM-MS). Both information systems are available at DATASUS.

Results: In the period from 2018 to 2022, there were 96,647 hospitalizations for HF in Paraná, which is equivalent to about 10.89% of the total, which was 887,019 hospitalizations for this disease throughout Brazil. The mortality rate in Paraná for the same period was 9.04%, while the corresponding rate in Brazil was 12.29%. During 2018 and 2019, Paraná had the second-lowest mortality rate, only after the state of Piauí, a state whose population is, on average, 3.5 times smaller. However, in the years 2020, 2021, and 2022, its placement fell, ranking third, ninth, and sixth, respectively, with rates of 8.46%, 11.85%, and finally 10.24%, after states like Piauí, Federal District, Espírito Santo, Tocantins, Amapá, Pará, Pernambuco, and Minas Gerais. Regarding the number of hospitalizations, Paraná has always been in third place over these five years regarding the absolute number of hospitalizations due to HF, behind the states of São Paulo and Minas Gerais, which have four and two times the population of Paraná, respectively. In this bias, Paraná had an increase in this absolute number of hospitalizations in the first two years, with 22,079 hospitalizations due to HF by the end of 2019. On the other hand, there was a decrease in the two following years, which reached 15,316 by the end of 2021. Concerning 2022, this number rose by around 20.39% from one year to the next, with 18,440 hospitalizations. In whole numbers, Brazil followed a line of decrease from 2018 to 2021, reaching 154,789 hospitalizations by the end of 2021; on the other hand, in 2022, there was an increase of 23.71%, which is equivalent to 191,491 hospitalizations.

Conclusion: HF represents the final pathway of many diseases affecting the heart. In this light, the onset or worsening of the HF symptoms usually leads the patient to hospitalizations and readmissions, both in the ward and the ICU. HF stands as one of the leading causes of admissions in patients over 65 years, with a high mortality rate. Thus, this syndrome is a public health problem not only in Brazil but globally, being responsible for generating high expenses and costs for public and private healthcare systems. Therefore, Paraná, with this data analysis, has a significantly good panorama considering its population size and overall health indicators.



• FT 78

The Impact of COVID-19 on Cardiovascular Surgeries in the State of Paraná

Laura Fermiano Bastos, Rui Manuel de Sousa Sequeira Antunes de Almeida

Introduction: In March 2020, the Secretary of State for Paraná issued a determination, based on Resolution SESA (State Department of Health) No. 338/2020, Article 27, which stated that “Regarding the performance of elective surgeries, the temporary suspension and subsequent rescheduling of all elective surgical procedures for all hospital services in the State of Paraná are recommended from 23/03/2020”. This suspension persisted for two years due to the COVID-19 pandemic. From 2022 onwards, there was a gradual return to performing elective procedures. The Brazilian Unified Health System (SUS) had to readjust itself with the aim of preserving intensive care unit (ICU) beds for the care of COVID-19 patients.

Objective: The objective of this study is to evaluate the total number of cardiovascular surgeries performed in each city under study during the pre-pandemic and pandemic years, to determine if there were any changes in the number of cardiovascular procedures. The study will analyze in which cities there was a greater and lesser reduction in the number of cardiac surgeries.

Methods: To conduct this study, the absolute numbers of cardiac surgeries recorded in the Department of Informatics of the Brazilian Unified Health System (DATASUS) were analyzed between June 2017 and June 2021 in the following cities in the state of Paraná: Arapongas, Campina Grande do Sul, Campo Largo, Campo Mourão, Cascavel, Curitiba, Foz do Iguaçu, Guarapuava, Londrina, Maringá, Pato Branco, Ponta Grossa, and Umuarama. The number of elective cardiovascular surgeries in the state of Paraná was counted for each city included in the study, on a monthly basis, within a three-year period (2019-2021). It is worth noting that all utilized data do not contain patient identification and solely pertain to elective cardiac surgeries performed by SUS during this period.

Results: Analyzing the total number of cardiovascular surgeries performed in the hub cities during the months from June 2017 to May 2021, a decrease of 0.5% is observed when compared to the pre-pandemic years (2017-2018 and 2018-2019), and an increase of 2.48% between the years 2018-2019 and 2019-2020. In response to the primary objective of the study regarding the variation in the total number of elective cardiac surgeries performed in the state of Paraná, the results revealed an overall negative variation of 30.7% in the flow of cardiac surgeries. This downward trend was particularly pronounced in Campina Grande do Sul with a decline of 71.3% followed by Campo Largo, with 37.1%, and Curitiba, with 26.2%, all within the year 2020-2021 comparison.

Conclusion: The results demonstrated that the pandemic was responsible for a negative variation in the majority of cities in the state of Paraná concerning the number of surgical procedures performed. The decrease can be explained by the fact that elective surgeries were postponed due to prioritizing COVID-19-infected patients and utilizing ICU beds for their care. This reduction may be correlated with an increase in urgent and emergency care, as clinical decompensation in cardiac patients has been the reason they seek medical attention in exceptional situations.



• FT 79

Profile of Cardiovascular Diseases in a Cardiology Ambulatory Care in Western Paraná

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Introduction: Circulatory system diseases have the highest morbidity and mortality rates in Brazil and globally. The Brazilian Society of Cardiology (SBC) pointed out that about 400,000 Brazilians die each year due to heart disease, corresponding to 30% of all deaths in the country.

Objective: The main objective of this study was to find out the incidence of heart diseases treated at an ambulatory care service in Cascavel during the year 2021, aiming to know the most prevalent diseases in the population. The secondary objective was to know the epidemiological profile of the patients and the forms of treatment most used by them.

Methods: This study is a descriptive research, with a documentary quantitative approach, with data collected in manual medical records and contained in the Tasy operating system, from January 2021 to December 2021, from a cardiology ambulatory care service located in Cascavel, Paraná. A total of 1,002 medical records were analyzed, and 290 were included in the research. Inclusion criteria consisted of patients over 18 years old of both sexes. Exclusion criteria consisted of patients under 18 years old, those with medical records filled out incorrectly, or individuals undergoing angioplasty or surgery. The research took place at the ambulatory care of Hospital São Lucas, located in the city of Cascavel, in the western region of Paraná. The ambulatory care service is destined for highly complex cardiac under the Brazilian Unified Health System (SUS).

Results: The 290 medical records of patients considered eligible for inclusion in the research were analyzed. The average age of this population was 62.13 years, 56% female and 44% male. The frequency of appointments was determined; most patients had only one throughout 2021. The most common comorbidities among these patients were analyzed, with dyslipidemia being the most prevalent, with 34.48%. Concerning the diseases for which patients are monitored at this service, systemic arterial hypertension is the most frequent; 87.93% of the patients in the survey were hypertensive to some degree. Among the drugs used by the patients, the most prevalent were statins (57.93%), angiotensin II receptor blockers (46.90%), and acetylsalicylic acid (AAS) (35.17%).

Conclusion: Systemic arterial hypertension was the most treated disease, presented by 87.93% of the patients, and dyslipidemia was the most frequent comorbidity, with a prevalence of 34.48%. These data are in line with what was previously observed in similar studies. Regarding the epidemiological profile of the population and the most used forms of therapy, 56% of the patients were women, a pattern repeated in the current literature. As for therapeutic interventions, statins and angiotensin receptor blockers are the primary medications used by the study patients.



• FT 80

A Machine Learning Model for Cardiovascular Surgery Prediction in Colombia: Are we there yet?

Javier Maldonado, Susana Chavez Leyton, Luis Felipe Giraldo, Silvia Alejandra Prada Lievano, Kevin Maldonado-Cañon

Introduction: Cardiovascular disease is one of the leading causes of mortality worldwide, responsible for 80% of deaths in low-income countries. Surgical treatment plays a crucial role in saving lives and preventing disabilities, making it increasingly significant in the field of public health. In Colombia, the European System for Cardiac Operative Risk Evaluation (EuroSCORE) is the most used tool to predict mortality. This score was developed based on a European database of patients who underwent cardiovascular surgery in 1995. Although this model has gained global recognition and adoption, it does not represent the Latin American population. There is an urgent need for validated scoring systems and prediction models specific to the Latin American population since most of them arose from other regions.

Objective: We aim to assess the performance of a machine learning-based classification model applied to a real-world dataset of patients undergoing cardiovascular surgery in Colombia.

Methods: We used a comprehensive dataset comprising patient records from 2008-2022, sourced from a prominent cardiovascular surgery center in Colombia. The dataset was preprocessed to handle missing values, normalize features, and address class imbalance. Variables included preoperative, operative, and postoperative care features as well as 30-day mortality. An optimized gradient boosting algorithm (XGBoost) was implemented. Evaluation metrics such as accuracy, precision, recall, and F1 score were calculated to measure the model's performance. A cross-validation Monte Carlo technique was used to validate the results and assess model generalizability. Additionally, feature selection techniques were applied to identify the most relevant predictors.

Results: A total of 27 variables were included based on the statistical (X2 test) and clinical significance. From 4,337 medical records and an overall 30-day mortality of 6%, we worked with 50 different random sets, with training set splits varying from 74% to 52%. A trade-off between precision and recall was made by adjusting the threshold for classification decisions based on the predicted probabilities from the model, resulting in a threshold of 46%. This means that any predictions with a probability above 46% would be classified as positive, while those below the threshold would be classified as negative. After the Monte Carlo validation, we found an imbalance in our database defined by an F1 score of 19%.

Conclusion: A score of 19% suggests that the model's predictions are not performing well. It could indicate a significant imbalance between precision and recall, with either a high number of false positives or false negatives. Further analysis is required to identify the specific areas for improvement and evaluate other performance metrics to gain a comprehensive understanding of the model's performance. Additionally, our results support the need for raising awareness within the medical community regarding the importance of database quality and efficient and standardized protocols for data collection in clinical records. We encourage regional collaborative efforts to implement a robust cardiovascular surgery information system in Latin America. By leveraging technology to streamline data collection, storage, and analysis, we can enhance patient care, improve healthcare decision-making, and promote efficient resource allocation. We believe it would hold immense potential to revolutionize healthcare within our discipline.



• FT 81

A New Technique for Interventricular Septal Defect Following Acute Myocardial Infarction Repair

Carlos Ramirez Palma, Juan Guillermo Sanz Cucullu, Hernaldo Veloz Salinas

Introduction: Despite advancements in classical surgical techniques and early interventions, the mortality associated with interventricular septal defect (IVSD) as a complication of acute myocardial infarction is still high.

Objective: To introduce a novel, simplified, and reproducible technique developed by a seasoned cardiac surgeon, which demonstrates promising results for all cardiac surgeons.

Methods: The technique we present here has been applied in four cases at our Hospital Regional de Talca in Chile. It contemplated bicaval cannulation, right ventriculotomy, and two pericardial patches the healthy tissue around IVSD using polypropylene sutures (one patch in the left ventricular chamber and the other in the right ventricular chamber).

Results: After a few cases resolved by the senior cardiac surgeon in his career, we have 4 patients resolved t our hospital (HRT). Clinical data and relevant photographs are available for these cases. Among the four patients, three have successfully survived the procedure, while one succumbed during surgery due to a free wall rupture.

Conclusion: In the context of this complex situation, this technique offers a simply, easily reproducible approach, with acceptable results.



• FT 82

Anomalous Left Coronary Artery with Intramural Segment: A Case Report of an Incidental Finding in Correction of Ascending Aortic Aneurysm and Aortic Valve Replacement

Vinicius Dinelli Guimarães, Raquel Reis Soares, Matheus Ferber Drumond, Guilherme Guimarães Medrado de Castro, João Victor Tavares Mendonça Garreto, Arthur Soares Lima, Chun Wei Chang, Elisa Soares Ferber, Leonardo Ferber Drumond

Objective: This report aims to discuss the approach and management of a complex incidental finding in a patient submitted to surgical correction of ascending aortic aneurysm (AAA) and aortic valve regurgitation. Intramural coronary artery (ICA) is a congenital anatomic variant of the main coronary arterial course. We present a case of ICA as an incidental finding during the aforementioned surgery.

Case Report: A 49-year-old patient was referred to the hospital with sudden dyspnea on exertion. The patient's medical history included hearing loss, and no other known comorbidities. A transthoracic echocardiogram showed severe aortic regurgitation and ascending aortic aneurysm measuring 67 mm. Upon undergoing open-heart surgery, an anomalous left artery coronary with intramural segment was found. Biological Bentall-De Bono procedure was performed to treat AAA and aortic valve replacement associated to the Cabrol technique to treat patient's coronary anomaly. The patient made a remarkable recovery and was discharged on the 10th postoperative day.

Conclusion: Ascending aortic aneurysm represents 60% of thoracic aortic aneurysms (TAA). It is a silent disease with well-defined etiology, complications, and treatment indications. Coronary artery anomalies (CAAs) represent a rare congenital condition, with no accurately known prevalence, but some studies show it ranges 1% of the general population. Usually, CAA is a benign and an incidental finding, characterized by anomalies of origin, course, and termination on any of the three main epicardial coronary arteries. In most patients with myocardial bridging, is not associated with adverse clinical sequelae, however, some patients may present symptoms even leading to sudden cardiac death. Medical therapy with beta-blockers and calcium-channel blockers are the first-line therapy. In some cases, coronary artery bypass grafting (CABG) or surgical myotomy can be considered, depending on lesion anatomy and surgical team's expertise. This case of ascending aortic aneurysm and proximal myocardial bridging took the team by surprise and the planning to perform the Bentall procedure with aortic valve replacement had to be associated with Cabrol technique for the reimplantation of the coronary ostium. Being knowledgeable about repair techniques for TAA and remaining vigilant for anatomical abnormalities allowed for swift decision-making, backed by readily available materials. This approach helped to solve the problem and reduce the cardiopulmonary bypass (CPB) time in this long procedure, reducing mortality and directly affecting patient prognosis.



• FT 83

Association Between Excessive Hemodilution During Cardiopulmonary Bypass and the Occurrence of Vasoplegia

Gabriela Zamunaro Lopes Ruiz, Bárbara Carolina Silva Almeida, Gabriela Vieira Marques da Costa Leão, Djenane Figueiredo de Rezende, Robson de Souza Almeida Junior, Davson José Bergamaschi Souza Costa, Bianca Ituassu Mapa Nonato Vicente Gallo, Ana Cristina Carioca, Claudio Leo Gelape, Gabriel Assis Lopes Do Carmo

Objective: To evaluate the occurrence of vasoplegia in patients who had a hematocrit drop below 24% during cardiopulmonary bypass, when compared to the population with hematocrit >24%.

Methods: A prospective cohort study of patients undergoing cardiac surgery at a teaching federal hospital in Brazil.

Results: A total of 847 patients operated between December 2016 and December 2022 were analyzed, with a median age of 59 years (49; 68) and 423 (49.9%) were female. The populations were different in terms of female sex (33.3% vs. 66%, $P<0.001$), age (57 [47;66] vs. 61 [51; 69], $P<0.001$), weight (74 [64; 84] vs. 66 [57; 74], $P<0.001$), body surface area (77.37 [66.92; 87.81] vs. 69.01 [59.61; 77.37], $P<0.001$), non-insulin dependent diabetes mellitus (48 [11.5%] vs. 72 [16.7], $P=0.03$), insulin-dependent diabetes mellitus (19 [4.6%] vs. 35 [8.1%], $P=0.034$), previous hematocrit (41.45 [38.1; 44.73] vs. 35.7 [32.05; 39.5], $P<0.001$), and EuroSCORE 2 (1.51 [0.89; 2.77] vs. 2.61 [1.37; 5.38], $P<0.001$), for groups without and with hemodilution, respectively. Vasoplegia occurred in 54 (12.9%) of patients with hemodilution compared to 121 (28.1%) in the group without hemodilution ($P<0.001$). Multivariate analysis showed that age (OR=1.033, 95% CI=1.016-1.050), hemodilution (OR=2.158, 95% CI=1.375-3.384), and EuroSCORE II (OR=1.073, 95% CI=1.037-1.111) were associated with the occurrence of vasoplegia. The adequacy of the logistic regression model was evaluated using the Hosmer-Lemeshow test and showed $P=0.411$. The area under the hemodilution ROC curve was 0.663 (95% CI=0.619-0.707) for the occurrence of vasoplegia.

Conclusion: The presence of hemodilution with a hematocrit below 24% during cardiopulmonary bypass was the most associated variable with the occurrence of vasoplegia in this cohort, surpassing even the EuroSCORE II. This data is added to others, such as the use of angiotensin-converting enzyme inhibitors, as a possible risk factor. Therefore, hematocrit monitoring should be systematic during the procedure, aimed at maintaining levels above 24%, according to the present study. In addition, measures must be taken to avoid significant intraoperative hematocrit drops, ranging from strategies to increase its value before the procedure to the use of packed red blood cells during cardiopulmonary bypass priming or off-pump procedures and the use of hemoconcentrators.



• FT 84

Bleeding Risk Stratification in Coronary Artery Surgery: The Should-Not-Bleed Score

Mirna Petricevic, Mate Petricevic

Introduction: An estimated 20% of allogeneic blood transfusions in the United States are associated with cardiac surgery. It is estimated that 11% of red cell resources were used for transfusion support of patients undergoing coronary artery bypass grafting (CABG) with a documented wide variability in transfusion rate (7.8 to 92.8%).

Objective: To address the issue of unnecessary transfusions within the CABG population, we developed a model to predict which patients are at low risk of bleeding, for whom transfusion treatment might be considered unnecessary. Herein we present the "SHOULD-NOT-BLEED-SCORE" application developed for the Windows® software platform, based on our previous research.

Methods: This study aimed to develop a user-friendly application that stratifies patients with respect to bleeding risk. The statistical model we used in our previous research was focused on detection of patients undergoing CABG at low risk of bleeding. The rationale behind such an approach was to identify a CABG patient subgroup at low risk of bleeding. By identifying patients at low risk of bleeding, we can define a subgroup of patients for whom transfusion treatment might be considered unnecessary. We developed an application for the Windows platform, based on risk modelling we have previously established using data from 1,426 patients undergoing elective CABG from January 2010 to January 2018.

Results: The SHOULD-NOT-BLEED-SCORE risk score is developed for the Windows software platform. A mathematical model based on multivariate analysis was used for app development. The variables that entered the scoring system were: Age, Body Mass Index, Chronic Renal Failure, Preoperative Clopidogrel Exposure, Preoperative Red Blood Cells Count, Preoperative Fibrinogen Level, and Preoperative Multiplate ASPI test area under the curve (AUC) units. The SHOULD-NOT-BLEED-SCORE identifies/predicts patients without a risk for excessive bleeding with strong discriminatory performance (receiver operating characteristic [ROC] curve analysis AUC 72.3%, $P < 0.001$).

Conclusion: The SHOULD-NOT-BLEED risk scoring application may be useful in the preoperative risk screening process. The clinical and economic burden associated with unnecessary transfusions may be adequately addressed by a preoperative scoring system detecting patients at low risk of bleeding.



• FT 85

Building and Application of Artificial Intelligence to Identify Patients at Increased Risk of Extended Hospitalization after Cardiac Surgery

Alvaro Machado Rosler, Marcela da Cunha Sales, Gustavo Simões Ferreira, Vinicius Willy Prediger, Jonathan Fraportto do Nascimento, Fernando Antônio Lucchese

Introduction: Prediction models in the cardiovascular area are common, constituting part of the daily routine of healthcare professionals. However, the use of techniques that involve machine learning (ML) and artificial intelligence (AI) are still uncommon.

Objective: Our purpose was to take advantage of the potential that these techniques have to offer and create a prediction model to identify patients at high risk for extended hospital stay after cardiac surgery.

Methods: We analyzed 37 baseline characteristics of 4,489 patients who underwent cardiac surgery between 2010 and 2022 and who were discharged from the hospital after the procedure. The outcome of interest was the postoperative hospitalization exceeding 10 days. Only patients undergoing coronary artery bypass graft surgery (CABG), aortic valve replacement (AVR), mitral valve replacement (MVR), AVR plus CABG, and MVR plus CABG were included. First, we applied the ExtraTree Classifier algorithm to identify variables most strongly associated with extended hospital stay, so it was possible to reduce the number of interest variables for the machine learning model from 37 to 6. Next, the dataset was randomly divided into two: training dataset (70% of the sample) and test dataset (30%). With the training dataset, a ML model based in the XGBoost algorithm was designed. The predictions made through the model were evaluated in the testing dataset, which contained data from patients that were highlighted only for this purpose.

Results: We identified 407 (9.1%) patients with more than 10 days of post-procedure hospitalization. Since then, 278 have been allocated in the training dataset and the remaining 129 in the test dataset. The first algorithm allowed the selection of six main factors: age, creatinine clearance, ejection fraction, hemoglobin, body mass index, and type of surgery. The resulting model had a success rate of 90.6%. After a validation process, the accuracy was set at 90.9% with a standard deviation of 0.002%.

Conclusion: The predictive model created through ML and AI showed high rates of success and accuracy and can be extremely useful as an alert system to identify patients at risk of extended hospital stays, thus enabling possible adjustments in the management of their hospital care.



• **FT 86**

Cardiac Surgery in Patients Older than 75 Years: Surgical Results and Short-Term Follow-Up in a Specialized Institute

Sandra Centurión, Alfredo Torres, Blas González, Jorge Delgado, Pablo Rodríguez, Marcos Melgarejo, Hugo Recalde, Víctor Rodas, Fabiola Godoy, Edison Martínez

Objective: To evaluate the results of cardiac surgery in patients older than 75 years operated from 2021 to December 2022.

Methods: Twenty-three patients, with an average age of 78.43 ± 3.5 , were operated on in the period 2021-2022. Surgical complications and 30-day surgical mortality were evaluated, as well as survival after one year of follow-up.

Results: The most frequently performed surgery was myocardial revascularization (47.8%, 11) followed by aortic valve replacement surgery (26.08%, 6); combined surgeries included aortic valve replacement and revascularization (3), mitral valve replacement and revascularization (1), mitral-aortic valve replacement (1), and mitral valve replacement (2). The mean hospital stay was 7.34 days in the intensive care unit and 10.2 days in the hospital ward. There were 2 reopenings due to bleeding, one case of tracheitis with prolonged intubation, one mild pneumothorax, 3 cases of pneumonia (one case associated with a ventilator, one case of central venous catheter infection, and one superficial left radial artery harvest site infection), 3 acute renal failure without need for dialysis, and 4 cases of postoperative atrial fibrillation. Two patients required permanent pacemaker implantation. The 30-day mortality rate was 13% (3 deaths). At one year of follow-up, survival rate was 95%.

Conclusion: The results of surgery in patients older than 75 years have demonstrated favorable results, although the study period is still short and complications could be reduced in the short term.



• FT 87

Clinical Characteristics Associated with the Occurrence of Pathological Hemodilution during Cardiopulmonary Bypass

Gabriela Zamunaro Lopes Ruiz, Bárbara Carolina Silva Almeida, Thiago Eustaquio Silva Asevedo, Thales Henrique Figueiredo Menezes, Robson de Souza Almeida Junior, Davson José Bergamaschi Souza Costa, Bianca Ituassu Mapa Nonato, Vicente Gallo, Ana Cristina Carioca, Renato Bráulio, Gabriel Assis Lopes Do Carmo

Objective: To evaluate the clinical characteristics of patients undergoing cardiac surgery that are associated with the occurrence of hemodilution during cardiopulmonary bypass (CPB).

Methods: A prospective cohort of patients undergoing cardiac surgery at a teaching federal hospital in Brazil.

Results: The analysis included a total of 847 patients operated between December 2016 and December 2022, with a median age of 59 (49;68) years and 423 (49.9%) were female. In the univariate analysis, female gender (OR 3.890, 95% CI 2.925-5.174, $P<0.001$), advanced age (OR 1.017, 95% CI 1.007-1.028, $P<0.001$), increased body surface area (OR 0.961, 95% CI 0.951-0.971, $P<0.001$), diabetes mellitus (OR 1.700, 95% CI 1.211-2.388, $P=0.002$), hemodialysis (OR 4.292, 95% CI 1.214-15.172, $P=0.02$), high preoperative hematocrit (OR 0.809, 95% CI 0.781-0.838, $P<0.001$), increased EuroSCORE II (OR 1.051, 95% CI 1.005-1.100, $P=0.028$), and urgent or emergency surgeries ($P<0.001$) were associated with the occurrence of excessive hemodilution during CPB. Multivariate analysis showed that female gender (OR 3.419, 95% CI 2.328-5.021, $P<0.001$), advanced age (OR 1.016, 95% CI 1.002-1.031, $P=0.03$), increased body surface area (OR 0.962, 95% CI 0.950-0.975, $P<0.001$), diabetes mellitus (OR 1.649, 95% CI 1.026-2.648, $P=0.039$), high preoperative hematocrit (OR 0.825, 95% CI 0.793-0.859, $P<0.001$), age (OR 1.033, 95% CI 1.016-1.050) and EuroSCORE II (OR 1.051, 95% CI 1.005-1.100, $P=0.028$), were associated with hemodilution. The adequacy of the logistic regression model was evaluated using the Hosmer-Lemeshow test and showed a P -value of 0.816.

Conclusion: Female sex, advanced age, diabetes mellitus and increased EuroSCORE II were positively associated with the occurrence of hemodilution, while increased body surface area and high preoperative hematocrit showed a negative association. The most strongly associated factor was female gender, with an OR of 3.419. Such factors must be considered in the surgical planning, with the objective of establishing measures to avoid a significant decrease in intraoperative hematocrit, ranging from strategies to increase its value before the procedure to the use of red blood cell concentrates in CPB priming.



• FT 88

Comparative Analysis of Demographic Profile and Treatment of Lung Cancer in Public and Private Healthcare Sectors: Data from the Brazilian Lung Cancer Registry

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Objective: To evaluate the influence of social health determinants on the demographic profile, diagnosis, and surgical treatment of patients with lung cancer included in the Brazilian Lung Cancer Registry (BLCR).

Methods: A retrospective analysis of a national multicentric prospective database of patients submitted to surgical treatment for lung cancer from 2019 to 2023.

Results: There were 1,486 patients included, from which 887 (59.7%) were from public healthcare sector and 599 (40.3%) from private healthcare sector. Both groups had a female predominance: 491 (55.4%) among public group and 334 (55.8%) among private group ($P=0.878$). The public group had a higher proportion of black and brown-skinned patients: 55 (6.2%) and 125 (14.1%), respectively. The private group had a greater number of non-smokers 199 (35.6%), *versus* 225 (25.7%) ($P<0.001$). There was no statistically significant difference regarding body mass index, diabetes, cardiovascular disease, stroke, renal disease, and the Charlson comorbidity index. However, the public group had a higher prevalence of chronic obstructive pulmonary disease patients (289, 32.6%, $P=0.003$). Patients of public group were more symptomatic at diagnosis (37.3%) and a larger proportion had a history of previous cancers detected during follow-up (23.1%). As for the private group patients, they were more often incidentally diagnosed (48.1%) and through screening (19.1%), with smaller tumor sizes (2.5 ± 2.4 cm). Most public group patients had biopsy before treatment (94.3%, 823), compared to 74.4% (358) of private group patients ($P<0.001$). Minimally invasive surgical approaches were more prevalent in the private group, with 24.9% (149) thoracotomies, 38.8% (232) video-assisted thoracic surgeries (VATS), and 36.6% (217) robotic assisted thoracic surgeries (RATS), in comparison with 50.4% (445) thoracotomies, 43.3% (382) VATS, and 6.3% (56) RATS in the public group. Nonetheless, hospital stays were similar in both groups, with a median of 6.7 ± 6.3 days, and there were no differences in postoperative complications such as empyema, pneumothorax, air leak >5 days, heart attack, or arrhythmia. Even so, the public group had more deaths in the first 30 days after surgery (8, 1%, $P=0.0334$) and worse overall survival (67.8% vs. 85%; $P=0.001$).

Conclusion: The demographic profile and comorbidities were similar for patients from the public and private health sectors. However, patients in the private sector were more frequently diagnosed through screening and had earlier detection, while public sector patients were more diagnosed with symptoms and during a follow-up for previous cancers, which suggests better health care access on the private sector. Also, minimally invasive surgery is more prevalent in the private sector, probably related to the lack of structural and technological resources in the public sector.



• FT 89

Construction and Application of Artificial Intelligence as a Precision Tool for Predicting the Mortality Risk after Cardiac Surgery

Alvaro Machado Rosler, Marcela da Cunha Sales, Jonathan Fraportti do Nascimento, Gustavo Simões Ferreira, Vinicius Willy Prediger, Fernando Antônio Lucchese

Introduction: The risk prediction of 30-day mortality after cardiac surgery still has important gaps. In this scenario, computational tools and advanced nonlinear math modeling, such as artificial neural networks, can represent a safe and effective solution to this problem. Thus, our purpose was to develop a pilot trial to build a risk prediction model for 30-day mortality after cardiac surgery based in a deep learning process and compare with EuroSCORE II (ESII) and the Society of Thoracic Surgeons STS score (STS).

Methods: For this pilot trial, we analyzed 56 baseline variables of 5,011 consecutive patients of southern Brazilian submitted to cardiac surgery between 2010 and 2022 in the coordinator centre of the project. First, we applied the Extremely Randomized Trees Classifier algorithm to identify the variables with highest association with 30-day mortality, and so it was possible to reduce the number of interest variables for the model from 56 to 15. Subsequently, the dataset was randomly divided into two distinct datasets: training (70% of the sample) and test (30%). With the training dataset, an artificial neural network (ANN) model was designed with 1,000 cycles of learning. The performance of ANN model, ESII and STS were evaluated and compared in the testing dataset. The predictive accuracies of both the ANN model and the risk scores were obtained for comparison through the areas under receiving operating characteristic curves (AUC) and DeLong Tests.

Results: For aortic replacement, aortic replacement plus coronary artery bypass graft surgery (CABG) and mitral replacement plus CABG, the predictive accuracies of ANN exceeded 80%, while the risk scores showed significantly lower values ($P < 0.05$). For CABG and mitral replacement, the ANN model was better, but with less difference in comparison with the risk scores ($P < 0.05$). For the five cardiac surgeries considered, the ANN model prediction was significantly better, and the same pattern of predictive accuracies was also observed when analyzing the general group (ESII AUC: 0.733, STS AUC: 0.690, ANN AUC: 0.808; $P < 0.05$).

Conclusion: The ANN model presented better results than traditional risk scores in all scenarios evaluated in this study, even with a relative low number of patients for an artificial intelligence study. Analyzing and comparing the predictive accuracies in the testing dataset, we can conclude that math modeling based on deep learning techniques has great potential and it is viable to develop useful and solid Brazilian risk prediction model.



● FT 90 Cost Analysis of Transfusion Therapy in Coronary Artery Surgery

Mirna Petricevic, Mate Petricevic

Introduction: In patients undergoing coronary artery bypass grafting (CABG), wide variability in transfusion rate (7.8% to 92.8%) raises the question of the amount of unnecessary transfusions.

Objective: The aim of the study was (1) to identify CABG patients at low risk of bleeding to whom transfusion treatment should be avoided and (2) to calculate the amount of possible cost savings that would be achieved by avoiding transfusion in low bleeding risk patients.

Methods: This retrospective observational study enrolled patients undergoing isolated elective CABG from January 2010 to January 2018. Patients were divided with respect to the presence of excessive bleeding and transfusion costs were compared between the two groups. Predictors for postoperative excessive bleeding were defined and multivariable logistic regression analysis and risk modeling were performed. The use of a model to predict patients at low risk of bleeding allowed for the estimation of transfusion cost savings assuming the patients who were found to be at low risk of bleeding should not be transfused.

Results: A total of 1,426 patients were enrolled in the analysis. Of those, 28.3% had excessive postoperative bleeding. The multivariate logistic regression analysis model was developed to identify/predict patients without excessive bleeding (receiver operating characteristic curve analysis, area under the curve 72.3%, $P < 0.001$). When applied to the existing database, the use of the developed model identifying patients at low risk of bleeding may result in a 39.1% reduction of transfusions. Specifically, cost savings would be 48.2% for packed red blood cells, 38.9% for fresh frozen plasma, 10.9% for platelets concentrate, and 17.9% for fibrinogen concentrate.

Conclusion: The clinical and economic burdens associated with unnecessary transfusions are significant. Avoiding transfusion in CABG patients found to be at low risk of bleeding may result in significant reduction of transfusion rate and transfusion-associated costs.



• FT 91

Effusive Constrictive Pericarditis Treatment: A Challenging Surgical Procedure

Sofia Rodriguez Lesa, Maximiliano Rodríguez, Juan Montero, Daniel Brusich, Pablo Straneo

Introduction: Effusive constrictive pericarditis, a rare disease, combines elements of pericardial constriction and pericardial effusion. Clinical presentation may be as a cardiac tamponade. However, usually there is a long latency since the primary event. Etiologies range from infectious origins (tuberculosis, viral) to post-radiotherapy effects, and, in some cases, remain idiopathic. Tuberculous pericarditis is more frequent in underdeveloped countries. Pericardial fibrosis and calcification determine venous congestion (systemic and pulmonary) and affects cardiac cavity filling during diastole, resulting in a lower ejection volume. Surgical treatment is the standard of care. However, perioperative mortality is high, reaching around 20%.

Objective: To present a clinical case of an effusive constrictive pericarditis.

Case Report: A 30-year-old male with a medical history for bacterial meningitis at the age of 2, two ventriculoperitoneal shunt procedures, and cerebral palsy. His father had a history of tuberculosis during the patient's childhood. Two weeks prior to consultation, the patient began with progressive abdominal distention and Class I-II dyspnea, which progressed to Class IV. Cardiovascular exam showed regular rhythm of 110 bpm, without murmurs or lower limb edema. Respiratory frequency was 15 bpm, with a SatO₂ of 97%. Bilaterally muffled sounds were detected in the inferior third of the chest. Electrocardiogram showed sinus tachycardia (110 bpm), diffuse repolarization alterations, and micro-voltages in limb leads. Chest-abdomen-pelvis computed tomography indicated abdominal fluid and bilateral pleural effusion. A pericardial effusion of 27 mm, with thickening of both pericardial layers, was also identified. Transthoracic echocardiography revealed exaggerated septal rebound with respiration, a left ventricular ejection fraction of 50%, respiratory variation of transmitral flow of 45%, right ventricle of normal dimensions and normal systolic function, without systolic or diastolic collapse, inferior vena cava measuring 24 mm without inspiratory collapse >50%. In addition, there was a severe pericardial effusion of 20 mm, with inhomogeneous echoes inside and predominantly on the right ventricular wall.

Results: Effusive constrictive pericarditis was diagnosed. Surgical approach was total sternotomy, without the use of cardiopulmonary bypass. Phrenic-to-phrenic parietal pericardium resection, and visceral pericardium resection were performed. This resection targeted the venae cavae, right atrium, outflow tract, and anterior face of both ventricles, effectively releasing the constrictive effects. Pericardial fluid was drained. Once the structures were released, hemodynamic improvement was immediate. GeneXpert test of pericardial samples was positive, confirming tuberculosis etiology. The patient started antituberculosis treatment, remained without cardiovascular symptoms and was discharged 6 days after the procedure.

Conclusion: Effusive constrictive pericarditis is a rare disease which may cause a high morbidity burden. Achieving an accurate diagnosis is key to treat these patients. Although surgical treatment is the standard of care, it requires great expertise and may be challenging.



• FT 92

Esophageal Cancer: Neural Networks, Complex System Analysis, Statistics, and Simulation Modeling for Best Management

Kshivets Oleg

Objective: To assess 5-year survival (5YS) and life span after radical surgery for esophageal cancer patients (ECP) (T1-4N0-2M0). The importance must be stressed of using complex system analysis, artificial intelligence (neural network computing), simulation modeling, and statistical methods in combination, because the different approaches yield complementary pieces of prognostic information.

Methods: We analyzed data of 557 consecutive ECP (mean age of 56.6 ± 8.9 years; tumor size of 6 ± 3.5 cm) radically operated (R0) and monitored from 1975 to 2023. The cohort consisted of 415 males, 142 females, who underwent various surgical procedures, including esophagogastrectomies (EG) Garlock (288) or Lewis (269), as well as combined EG with resection of organs such as pancreas, liver, diaphragm, aorta, VCS, colon transversum, lung, trachea, pericardium, spleen (168). Tumor types included adenocarcinoma (319), squamous (228), and mixed (10), with varying tumor stages (T1=130, T2=115, T3=184, T4=128), nodal involvement (N0=282, N1=70, N2=205), and grades (G1=157, G2=142, G3=258). The cohort encompassed early-stage EC (111) and invasive cases (446). Treatment modalities included surgery alone (425), adjuvant chemoimmunoradiotherapy (AT, 132), with 5-FU+thymalin/taktivin+radiotherapy 45-50 Gy). Multivariate Cox modeling, clustering, structural equation modeling and path analysis, Monte Carlo simulations, bootstrap method, and neural networks computing were used to determine any significant dependence.

Results: Overall life span (LS) was $1,876.9 \pm 2,219.8$ days, with a cumulative 5YS reaching 52%. The 10-year survival was 45.5%, 20-year survival was 33.4%, and the 30-year survival was 26.9%. A total of 187 ECP lived for more than 5 years (LS= $4,271 \pm 2,411.9$ days), and 99 ECP lived for more than 10 years (LS= $5,883 \pm 2,296.6$ days). Among ECPs, 228 died because of esophageal cancer (LS= 629.8 ± 324.1 days). AT significantly improved 5YS (67.8% vs. 48.7%) ($P=0.00084$ by log-rank test). Cox modeling displayed that 5YS of ECP significantly depended on: phase transition (PT) N0-N12 in terms of synergetics, cell ratio factors (ratio between cancer cells [CC] and blood cells subpopulations), T, G, histology, age, AT, localization, prothrombin index, hemorrhage time, residual nitrogen, and protein ($P=0.000-0.019$). Neural networks, genetic algorithm selection, and bootstrap simulation revealed relationships between 5YS and healthy cells/CC (rank=1), phase transition (PT) early-invasive EC (2), PT N0-N12 (3), erythrocytes/CC (4), thrombocytes/CC (5), stick neutrophils/CC (6), lymphocytes/CC (7), segmented neutrophils/CC (8), eosinophils/CC (9), leucocytes/CC (10), and monocytes/CC (11). Correct prediction of 5YS was 100% using neural networks computing (area under ROC curve=1.0; error=0.0).

Conclusion: The 5-year survival of ECP after radical procedures significantly depended on: 1) PT early-invasive cancer; 2) PT N0-N12; 3) cell ratio factors; 4) blood cell circuit; 5) biochemical factors; 6) hemostasis system; 7) AT; 8) EC characteristics; 9) EC cell dynamics; 10) tumor localization; 11) anthropometric data; 12) surgery type. Optimal diagnosis and treatment strategies for EC are: 1) screening and early detection; 2) availability of experienced thoracoabdominal surgeons because of the complexity of radical procedures; 3) aggressive *en bloc* surgery and adequate lymph node dissection for completeness; 4) precise prediction; 5) adjuvant chemoimmunoradiotherapy for ECP with unfavorable prognosis.



• FT 93

Fluid Therapy in Cardiac Surgery: The Specialist's Approach in Uruguay

Pablo Straneo, Joaquin Abelleira, Jonathan Brenes, Pablo Brum, Valentina Cabrera, Valentin Camacho, Leticia Turconi

Introduction: Despite being an essential part of the medical management of cardiac surgery patients, there is no current consensus over fluid therapy in this scenario. Evidence is scarce internationally and in Latin America. Some authors have compared it with general surgery's fluid therapy. However, results are inconclusive. Therefore, cardiac surgery fluid therapy protocols are an unmet need. We aimed to assess specialist's attitude towards fluid therapy in cardiac surgery.

Methods: We carried out an observational cross-sectional study in Montevideo, Uruguay. A virtual survey was distributed among different specialists involved in cardiac surgery patients' care (cardiac surgeons, intensive care doctors, cardiologists, anesthesiologists). The survey assessed blood volume goals, preferences for specific types of fluids, response assessment, and the primary sources of consulted bibliography to guide decisions. Clinical approaches in specific clinical situations, such as positive and negative balance, were also evaluated. This protocol was approved by our institution's Ethics Committee.

Results: The survey had 53 answers, 41.5% (n=22) from anesthesiologists, 22.6% (n=12) from intensive care doctors, 18.9% (n=10) from cardiologists, and 17% (n=9) from cardiac surgeons. Regarding blood volume, none of the responders reported a goal in preoperative setting. During surgery, 74.2% of the specialists did not set a goal volume, 12.9% reported a goal under 3 liters, 9.7% under 2 liters, and 3.2% under 1 liter. In the intensive care unit (ICU), 46.2% did not report a goal volume, 23.1% aimed to a blood volume under 1 liter, 23.1% under 3 liters, and 7.7% under 5 liters. During surgery, 83.8% of the specialists choose crystalloids as their first option, followed by 54.8% opting for blood derivatives as second choice. Furthermore, 38.7% preferred a combination of colloids and crystalloids as third fluid of choice, and 54.8% stated that colloids were their fourth choice. During ICU stay, crystalloids were the first choice for 84.6% of the specialists, blood derivatives the second choice for 84.6%, and combination and colloids were the third and fourth choices for 61.5% and 76.9%, respectively. Diuresis and lactate were the more used parameters to assess response during surgery, with 87% and 84% of the specialists reporting it and, in the ICU stay, 85% and 85%, respectively. In patients with negative balance during surgery, 67.7% of specialists adjusted fluids dose and 16.1% switched to blood derivatives. During ICU stay, 46.2% adjusted doses, 23.1% switched to blood derivatives, 23.1% transitioned to a crystalloid and colloid combination, and 7.7% shifted to crystalloids. In patients with positive balance during surgery, 87.1% of specialists adjust doses and 12.8% stopped fluids. In terms of decision-making, 71.1% of the specialists answered they guide their decisions on clinical guidelines.

Conclusion: We engaged different specialists to elucidate their position towards fluid therapy in cardiac surgery patients. Crystalloids are the most used fluids. We highlight the lack of a blood volume goal in each stage. Most specialists consider diuresis as the main response indicator. Although most of the specialists reported adherence to clinical guidelines, there are no current specific guidelines for fluid therapy in cardiac surgery patients. We strongly believe that fluid therapy protocols and clear goals would positively impact the outcomes of cardiac surgery patients.



• FT 94

Meta-analysis of Postoperative Pain of Full Sternotomy *versus* Mini-Incisions in Cardiac Surgery

Antonio de Jesus Chaves Junior, Paula Stelitano Avelino, Gilmar Santos Oliveira Junior, João Pedro Morais Alves Gomes, Jackson Brandão Lopes

Introduction: It is not yet clear whether minimally invasive cardiac surgery (MICS) is overall less painful than the conventional approach by full sternotomy (FS). A meta-analysis is necessary to investigate pooled results on this topic.

Objective: The objective of this work was to compare the intensity of postoperative pain, measured at least one point in the first seven days of conventional cardiac surgery performed via full sternotomy (FS) *versus* minimally invasive cardiac surgery using mini-incision (MI).

Methods: PubMed/MEDLINE, Cochrane Central, LILACS, and SciELO were searched for all clinical trials, reported until 2022, comparing FS with MICS in coronary bypass graft surgery (CABG), mitral valve surgery (MVS) and aortic valve replacement (AVR) and analyzed postoperative pain outcome. The main summary measures were the standardized mean differences (SMD) with a 95% confidence interval (CI) and P-values considered statistically significant when <0.05 .

Results: In AVR, the general estimate of postoperative pain effect favored MICS (SMD 0.87 [95% CI 0.04-1.71], $P=0.04$). However, in the sensitivity analysis, there was no difference between the groups (SMD 0.70 [95% CI -0.69-2.09], $P=0.32$). For MVS, it was not possible to perform a meta-analysis with the included studies, because they had different methodologies. In CABG, the general estimate of the effect of postoperative pain did not favor any of the approaches (SMD -0.40 [95% CI -1.07-0.26], $P=0.23$), confirmed by sensitivity analysis (SMD -0.02 [95% CI -0.71-0.67], $P=0.95$).

Conclusion: Cardiac surgery by MICS was not globally less painful than the FS approach. It seems that postoperative pain is more related to the degree of tissue retraction than to the size of the incision.



• FT 95 Heart Atrial Thrombi: A Diagnostic Challenge

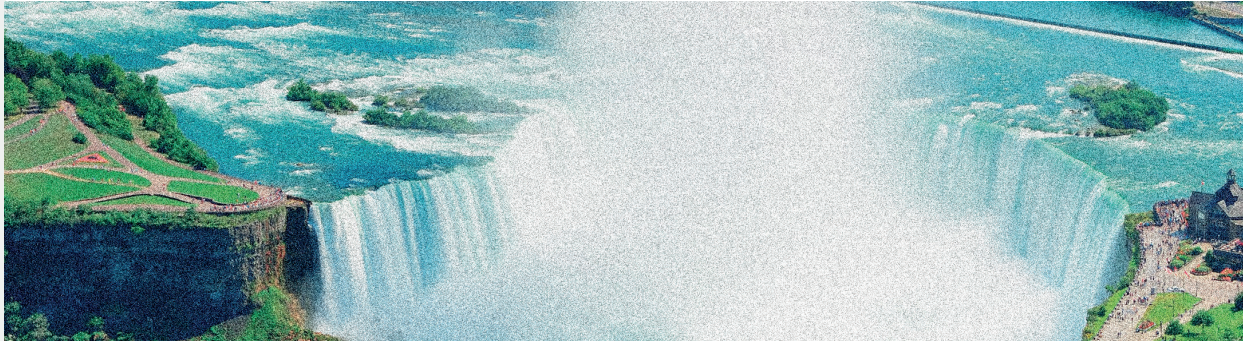
Ramón Adolfo Arévalo Abascal, Carlos Amorós Rivera, Nuria Arce Ramos, Yolanda Carrascal Hinojal, Bárbara Segura Méndez, Eduardo Velasco García, Ignacio Vázquez Alarcón de la Lastra, David Daniel Félix Pérez, Rocío Bernal Esteban, Juan Bustamante Munguiras

Objective: An atrial thrombus could be confused with an atrial myxoma, and if these tumors are multiple and accompanied by other signs, they could be confused with a Carney complex. We present a case report of a patient diagnosed with a left atrial tumor suspecting of an atrial myxoma. This tumor was surgically removed and during the procedure another tumor was found in the right atrium. Due to these findings, a Carney complex was suspected but it was finally ruled out after receiving the pathology report.

Case Report: We present the case of a 69-year-old woman with a personal history of hypercholesterolemia, hypertension, severe diabetes, morbid obesity, carotid atheromatosis, and amputation of the right index finger due to melanoma. In 2017, she presented a vertebrobasilar stroke with residual ataxic gait. Paroxysmal atrial fibrillation was diagnosed, and anticoagulation treatment was started. She suffered from five more strokes, the last one in July 2022, and was diagnosed with a tumor in the left atrium. A transesophageal echocardiogram was performed and showed a heterogeneous tumor measuring 40×38 mm, with sessile implantation on the left atrial roof, suspecting a left atrial myxoma. A cardiac CT scan was performed to better characterise the tumor and prepare for the surgery. The CT scan revealed a left atrial mass anchored in the right atrial roof next to the right superior pulmonary vein, suggestive of atrial myxoma.

Results: Based to the mentioned findings, surgery was performed through the right atrium with opening of the interatrial septum. Another tumor, measuring 3 centimeters, with a broad implantation base, was accidentally found in the right atrium and resected. Both tumors were sent to pathological examination. Patient's history (skin tumor lesion) and intraoperative findings (suspicion of multiple cardiac atrial myxomas) led us to suspect a Carney complex. However, it was necessary to wait for the results of the pathological examination to reach a definitive diagnosis with multiple atrial thrombi.

Conclusion: Therefore, appearances are deceptive sometimes, and we want to reflect on the problem of differentiating atrial thrombi from myxomas. The presence of multiple cardiac tumors and the patient history of skin tumors led us to suspect a Carney complex as the first diagnostic possibility. We would also like to emphasize the difficulty of distinguishing a thrombus and an atrial myxoma and to highlight the importance of performing a preoperative magnetic resonance imaging as the best radiological imaging test to difference them.



• FT 96

How Can I Act after an Iatrogenic Gerbode Defect?

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Objective: The Gerbode defect is defined as an abnormal shunt between the left ventricle and the right atrium, which may be congenital or acquired. The acquired defects can be iatrogenic or non-iatrogenic. We present a case of a 32-year-old patient diagnosed with aneurysm of the ascending aorta and subaortic membrane who, after undergoing cardiac surgery, presented a Gerbode defect in the immediate postoperative period that required further intervention for repair.

Methods: We present the case of a 32-year-old patient with various cardiovascular risk factors (dyslipidemia, hypertension, former smoker) and a family history of sudden death due to possible aortic pathology. He was referred by his primary care physician due to the casual finding of a systolic murmur in the aortic area in the context of fever. An echocardiogram was performed, revealing an enlarged ascending aorta (54 mm) and the presence of a subaortic membrane that caused flow acceleration of the left ventricular outflow tract. Subsequently, a chest CT scan was performed and the diameters of the ascending aorta (57x56 mm) were confirmed. Due to these findings, surgery was performed to replace the ascending aorta with a supracoronary tube graft and to resect the subaortic membrane.

Results: During resection of the subaortic membrane, the membranous interventricular septum was accidentally opened, and it was repaired with three U-shaped stitches reinforced with Teflon pledgets. During the immediate postoperative period, the patient presented signs and symptoms of right heart failure, with edema, jugular engorgement and liver failure with high bilirubin and liver enzymes. An echocardiogram was performed showing a communication between the left ventricle and the right atrium, with severe tricuspid regurgitation. These findings were confirmed with a CT scan and nuclear magnetic resonance. Given the poor clinical evolution of the patient, we decided to intervene surgically 15 days after his first procedure. During the intervention, an intermediate type Gerbode defect was appreciated, with both components: a supralvalvular or direct defect and an infravalvular or indirect defect. We proceeded to its direct closure through right atriotomy with 3 U-shaped stitches reinforced in Teflon with detachment of the antero-septal leaflets of the tricuspid valve and subsequent leaflets reposition. The patient had a satisfactory evolution, with improvement in his right heart and liver failure. Finally, he was discharged one week after the second surgery. Gerbode defect has been considered a congenital heart disease. However, in recent years several acquired Gerbode cases have been reported due to improved diagnostic capabilities and a greater number of invasive cardiac procedures such as surgery, ablation or infectious endocarditis.

Conclusion: With this case report, we would like to highlight the importance of an early diagnosis of iatrogenic Gerbode defects after a surgical procedure and its subsequent surgical repair, through a right atriotomy approach with detachment of the tricuspid valve for better visualization, resulting in a satisfactory clinical evolution for the patient.



• FT 97

Improvement of Frailty Screening Tool Scores after Cardiac Surgery

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Objective: To measure and compare frailty scale scores before and after major cardiac surgery and evaluate how the results evolve after cardiac intervention.

Methods: In the past, our group published the results of a prospective 232-patient cohort study that underwent cardiac surgery and compared the outcomes of frail patients *versus* non-frail patients using the Fried frailty phenotype (FFP) and the FRAIL questionnaire (FRAIL). We showed that frail patients had more complications and presented higher risk of suffering a prolonged postoperative stay. We also showed that NYHA class, female sex, and pulmonary hypertension (PHT) act as confounding factors for frailty and poor outcomes after cardiac surgery. Now we have repeated the frailty screening tests on all survivors 6 weeks after discharge and have compared the results using a Wilcoxon signed-rank test. Logistic regressions were used to identify independent risk factors for frailty six weeks after surgery.

Results: Of the patients that survived surgery, six weeks after discharge, 30,1% (63) were considered frail by FRAIL, while only 26,5% (54) were so by the FFP. Overall, mean FRAIL was reduced after surgery from 2.38 to 1.85 points ($P=0.001$) while the FFP scores showed no difference. However, when looking only at the preoperatively frail patients, the FFP showed even more significant reduction, from 3.45 down to 2.5 points ($P=0.001$). Age was identified as an independent risk factor for postoperative frailty (RR 1.6 [95% CI: 1.04-2.3], $P=0.032$).

Conclusion: We have showed that while high frailty scores worsen the results after cardiac surgery, given the higher risk of complications and prolonged postoperative stay, these results improve after surgery. Frailty is a fluid state that can be improved with interventions like cardiac surgery and that frailty scales are influenced by reversible factors, like NYHA class and PHT. Age was the only independent risk factor found for remaining frail after surgery.



• FT 98

Inferior Vena Cava Torsion in Late Postoperative Right Pneumectomy

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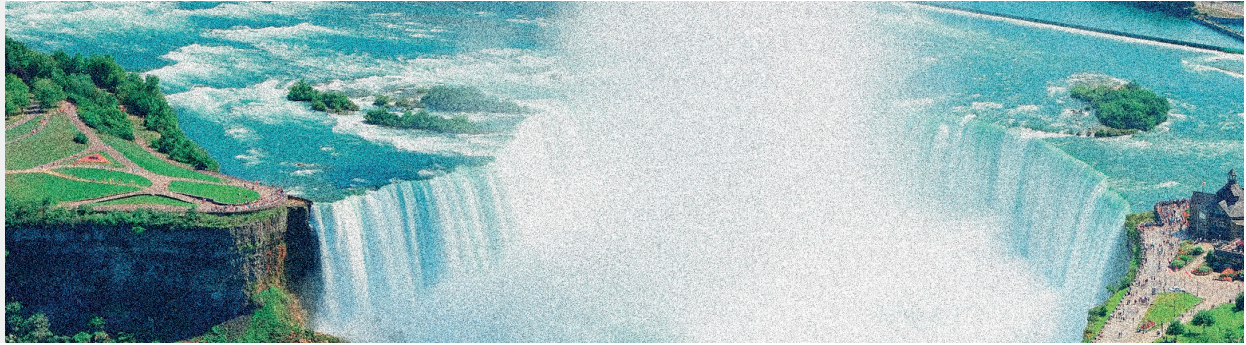
Introduction: Pneumectomy is the surgical removal of one of the lungs, especially indicated due to the presence of voluminous tumors in the organ or other lesions that present complexity for a resection by lobectomy. Although technically simple, pneumonectomy often has a high incidence of complications, some of which potentially serious.

Objective: We aim to report a case of a rare late complication of the right pneumectomy.

Methods: A comprehensive review of the patient's medical records was performed to collect information about the case.

Case Report: A 32-year-old female patient underwent a right pneumonectomy in January 2019 with resection of the superior vena cava and reconstruction with a Dacron prosthesis due to an inflammatory myofibroelastical tumor. In the same year, she presented with a massive right pleural effusion with the need for two relief thoracenteses. In 2020, the patient developed acute pericarditis, which was initially treated with colchicine and ibuprofen, becoming recurrent, requiring the continued use of systemic corticosteroids (prednisone) and, subsequently, immunosuppressants (cyclophosphamide). The patient also had stenosis of the Dacron prosthesis and superior vena cava syndrome, and underwent balloon angioplasty in 2021, without stent placement, with an improvement in dyspnea for only a few weeks. Imaging tests (CT scan and MRI) performed in 2022 revealed extreme displacement of the heart towards the apex of the right hemithorax, objective signs of low preload in the right chambers, possible stretching/torsion of the inferior vena cava, and thrombosis of the prosthesis placed in the superior vena cava. Faced with limiting symptoms of dyspnea at rest and chest pain on minimal exertion, a surgical approach was then proposed to return the heart to its anatomical position and fill the right thoracic cavity with tissue expanders, a procedure successfully performed in 2023. The adhesions formed were removed, and the heart was repositioned, using the expanders as a shield. Transoperative echocardiogram confirmed the correct positioning of the inferior vena cava, as well as the return to its usual described caliber.

Conclusion: This case report shows late torsion of the inferior vena cava after right pneumonectomy. The proposed treatment, with the use of tissue expanders to fill the space of the right thoracic cavity and thus form a shield to the heart, can be a surgical technique to be considered for this type of complication.



• FT 99

Minimally Invasive Approach Via Percutaneous Femoral Cannulation for the Resection of Intracardiac Masses: A Single-Center Experience in the Middle East

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Introduction: Intracardiac masses are rare and challenging lesions with an overall incidence ranging from 0.02% to 0.2%. Minimally invasive approaches have been recently introduced for surgical resection of these lesions. Herein we evaluated our early experience using minimally invasive techniques in addressing intra cardiac lesions.

Methods: This is a retrospective descriptive study conducted between April 2018 to December 2020. All patients were diagnosed with cardiac tumors and treated via right minithoracotomy with cardiopulmonary bypass through femoral cannulation at King Faisal Specialist Hospital and Research Centre, Jeddah.

Results: Myxoma was the most common pathology, representing 46% of cases, followed by thrombus (27%), leiomyoma (9%), lipoma (9%), and angiosarcoma (9%). All tumors were resected with negative margins. One patient underwent conversion to open sternotomy. Tumor locations were right atrium, left atrium, and left ventricle, in 5, 3, and 3 patients, respectively. The median ICU stay was 1.33 days. The median length of hospital stay was 5.7 days. There were no instances of hospital mortality within the 30-day period among the individuals in this cohort.

Conclusion: Our early experience shows that minimally invasive resection can be performed safely and effectively for intracardiac masses. The minimally invasive approach using a minithoracotomy with percutaneous femoral cannulation can be an effective option to resect intracardiac masses, achieving clear margin resection, quick postoperative recovery, and low rates of recurrence for benign lesions.



• FT 100

Mitral Valve Intervention Associated with Septal Myectomy in Hypertrophic Obstructive Cardiomyopathy Patients

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Introduction: Although the role of septal myectomy in patients with hypertrophic obstructive cardiomyopathy (HOCM) is clearly established, and it is widely recognized that mitral valve leaflets play a important role in the pathophysiological process of left ventricular outflow tract obstruction, the role of mitral valve interventions in combination with myectomy remains controversial.

Objective: The aim of this study is to compare results of patients operated on for HOCM, with or without mitral intervention.

Methods: This is a retrospective review of 94 consecutive operations for left ventricular outflow tract obstruction in HOCM patients from 2011 to 2022. Demographic profiles, echocardiogram and hemodynamics data, operative data, in-hospital and clinical and echocardiogram follow-up outcomes were analyzed.

Results: Of the 94 operations, 51 (54%) were isolated septal myectomies (IM Group) and 43 were myectomies with mitral valve or subvalvular apparatus intervention (M-MV Group). Mitral valve interventions were mitral repair (9, 9,5%) or replacement (3, 3,5%) for intrinsic mitral valve pathology; anterior leaflet shortening (25, 26,6%), chordae tendineae resection (14, 14,8%) and anomalous papillary muscle resection (8, 8,5%). Patients in M-MV Group had thinner septum (20.2±3.9 mm vs. 22.2±3,7 mm, $P<0.001$); greater anterior mitral leaflet length (31.5±3.2 vs. 29.5±3.2 mm, $P=0.003$), and greater preoperative mean echocardiographic mitral regurgitation (2.1±1.2 vs. 1.7±1.04, $P=0.005$) than patients without mitral intervention. Prevalence of in-hospital permanent pacemaker insertion for complete heart block was 7.4%, and 5.3% for isolated septal myectomy with normal preoperative conduction, with no differences between groups. There were three postoperative ventricular septal defects (3.19%) (2 of them in M-MV group, $P=NS$) and 30-day mortality was 1.06% (1 patient). Postoperative basal gradients for the entire population were significantly lower than preoperative ones (6.4±9.3 vs. 49.2±31.4 mmHg, $P<0.001$) and they remained equally low at follow-up (4.6±9.4 mmHg, $P<0.001$ vs. preoperative; $P=NS$ vs. postoperative gradients). The same occurred for Valsalva gradients. When considering gradients in each group separately, a significantly reduction was also observed ($P<0.01$ vs. basal in IM and M-MV groups). Mean follow-up was 3.3 years (IQR 1.1-5 years) for the entire group. During this time, 84 patients (90,3%) remained asymptomatic, with no significant difference between the IM and M-MV groups (90.3% vs. 90.2%, respectively, $P=NS$). Symptom-free survival was 98.8±1.2% at 1 year and 89.8±4.1% at 5 years. One patient (2.3%) in M-MV group was reoperated two years after the primary intervention for severe mitral regurgitation and class III NYHA dyspnea ($P=NS$ between groups). Reintervention-free survival was 98.4±1.6% at 5 years. Global mortality at follow-up was 9.5% (9 patients). Six patients died in IM group (11.5%) and 3 in M-MV group (7.3%), $P=NS$. Global survival was 96.6±1.9% at one year and 79.5±4.2% at 5 years.

Conclusion: Septal myectomy with mitral valve intervention, in patients with moderate hypertrophy and large anterior mitral valves, can be performed safely, with excellent outcomes.



• FT 101

Mobile Intrapericardial Bullet: A Case Report

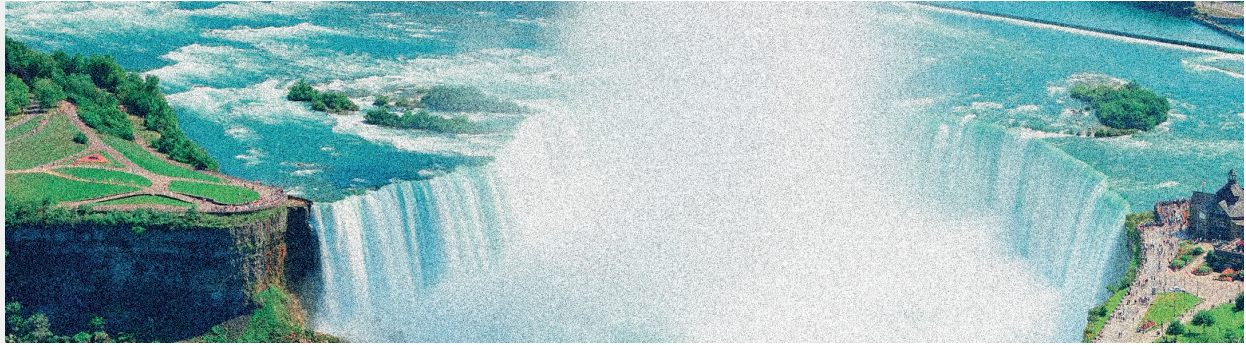
Camila Cury Caruso, Mario Augusto Cray da Costa, Luana Martins de Oliveira, Aurélio Vicente Stangue de Lara, Lucas Vinicius Mamadi Machado, Vitória Rossetim Celinski

Objective: This article aims to report a rare case of a mobile intrapericardial bullet, associated with no pulmonary or cardiologic lesions.

Methods: We present a case of a 22-year-old female patient who was admitted to the hospital due to a gunshot wound in the precordial region.

Results: Upon arrival the patient was stable, with vital signs showing oxygen saturation of 99% in ambient air, blood pressure of 193x16 mmHg and heart rate of 77 bpm. There was just an entry wound in the precordial region and no exit wound was found. The patient was admitted and hospitalized for further investigation. Imaging studies, including tomography and radiography, revealed a bullet lodged below the left branch of the pulmonary artery and below the left bronchus. Routine X-rays demonstrate the mobility of the projectile in the pericardial sac, with no signs of contrast extravasation, pneumomediastinum, pneumopericardium, or hemopericardium. The patient was submitted to a ministernotomy, pericardiotomy and removal of the foreign body, without evidence of cardiac or major vessel injury. The surgery was performed successfully without complications, and the patient was discharged three days later.

Conclusion: Literature shows that both conservative and non-conservative approaches, such as the one chosen for this specific case, are possible in this situation. However, how these are infrequent cases, there is a lack of information to guide a recommended conduct.



• FT 102

Patient Profile and Determinants of Mortality in Elective Cardiovascular Surgeries – Insights from the Preliminary Sample of the Cardioplegia Trial

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Objective: Knowing the patient profile is important for the characterization and evaluation of risk factors, as they are determinants of postoperative outcomes and can contribute to better results. In this context, this study aimed to describe the baseline demographic and preoperative characteristics of patients undergoing elective cardiovascular surgery. The study also seek to identify independent mortality predictors in this population, focusing on identifying risk factors, using preliminary data from the Cardioplegia Trial (registration number RBR-7g5s66), an important clinical trial which compares the efficacy of three long-acting cardioplegic solutions for myocardial protection.

Methods: This observational study included adult patients undergoing elective coronary artery bypass grafting (CABG) or valve replacement surgery at Hospital Nossa Senhora da Conceição between July 2020 and December 2022, randomized to the trial. Demographic data, clinical variables and mortality-related information were collected. Fisher's exact test was used for the comparison of categorical variables, while Student's t-test or Mann-Whitney test was used for continuous variables. The independent association of predictors of mortality was assessed using Poisson regression with robust variance, and the estimated effect measure was the relative risk with a 95% confidence interval. A significance level of 5% was adopted.

Results: Out of the 99 patients in the sample, 62 underwent CABG and 37 underwent valve replacement surgery, resulting in an 8,1% mortality rate (n=8). Age, diabetes mellitus (DM), atrial fibrillation (AF), serum troponin levels, as well as the EuroSCORE, were baseline characteristics related to mortality ($P<0.05$). Furthermore, serum levels of creatinine, urea, and glycated hemoglobin demonstrated a tendency towards statistical significance in their association with mortality. When analyzed based on the type of surgery, patients undergoing CABG had higher levels of glycated hemoglobin (HbA1c), leading to a higher incidence of DM. Meanwhile, patients undergoing valve replacement surgery had more cases of AF compared to CABG. In the multivariate analysis, only DM (RR=17.17; $P=0.004$) and serum creatinine (RR=2.91; $P=0.05$) were independent predictors of mortality.

Conclusion: This study's findings highlight the importance of identifying and managing preoperative risk factors, particularly DM and renal function, in patients undergoing elective cardiovascular surgery to improve outcomes and reduce mortality. The results also suggest that glycemic control may be particularly important in patients undergoing CABG, while AF may be more prevalent in those undergoing valve replacement. Further studies with larger sample sizes are needed to confirm these associations and explore potential interventions to improve outcomes in these high-risk patients.



• FT 103

Pericardiectomy for Recurrent Pericardial Effusion and Chylothorax in a Patient with Hodgkin's Lymphoma

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Objective: To present a case of a patient with Hodgkin's lymphoma with recurrent pericardial effusion requiring pericardiectomy.

Methods: A 24-year-old male patient, diagnosed with stage 4 classical Hodgkin's lymphoma, presented progressive dyspnea after the last chemotherapy cycle in February 2023, treated with bleomycin, etoposide, adriamycin, cyclophosphamide, vincristine, procarbazine, and prednisone (BEACOPP), and evidence of bilateral pleural and moderate pericardial effusion. Serial echocardiography revealed increased pericardial effusion, with signs of diastolic restriction. The patient underwent subxiphoid pericardial window and was discharged from hospital, but returned the subsequent month with recurrence of pericardial effusion, this time with cardiac tamponade.

Results: Considering the patient's history and the recurrence presented, pericardiectomy and bilateral pleural drainage were indicated. Usual monitoring was established, and a sternotomy was performed, revealing a mediastinal mass located close to the innominate vein, evaluated as unresectable, as a probable tumor infiltration by contiguity. A chylous aspect of the mediastinal and pleural fluid was observed, confirmed as chylothorax. Bilateral chest tube placement (thoracostomy) was performed, also functioning as a mediastinal drainage. Sternorrhaphy and layered suture concluded the surgery, and the patient was transferred to the intensive care unit. Deficiency in lymph/chyle drainage in the thoracic duct was diagnosed after performing lymphography. The patient had left internal jugular vein thrombosis, treated with anticoagulation. The patient stayed few days in intensive management, being taken to the ward. Proposed treatment with a fat-free diet and specific parenteral nutrition indicated a reduction in the volume of drain output. Left pleural drain was removed, keeping the right one. There was no need for thoracic duct dilation or pleurodesis. Chemotherapy management was resumed days later. Treatment with specific antimicrobials was maintained and guided according to the results of cultures. Control echocardiography and serial chest X-rays showed no alterations. After removing the right pleural drain, the patient was discharged from the hospital a month after the surgical procedure of pericardiectomy.

Conclusion: Recurrent pericardial effusion is relatively common in patients with oncologic disease. The management in these cases should be discussed by a team of hematologist, oncologist and surgeon, aiming at preventing the return of the voluminous pericardial fluid.



• FT 104

Precision Robotic Sublobar Resections: Advanced Surgical Planning Protocol with Three-Dimensional Models

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Objective: To describe a surgical planning protocol for robotic anatomical sublobar resections using three-dimensional (3D) analysis of computed tomography (CT) scan images and report the anatomical findings with their impact on surgery.

Methods: A preoperative planning protocol was created using CT scan analysis software (Synapse Vincent, Fujifilm). The CT scan anatomic structure segmentation was performed by biomedical team. The segmentation was then assessed by radiologists and thoracic surgeons. Thus, the conventional tomographic images obtained in DICOM format were transformed into 3D models and accompanied by a detailed descriptive report. The 3D models were used intraoperatively for surgical navigation. For the analysis of results, data referring to arterial, venous and bronchial anatomical dispositions were added, as well as information regarding the lesion position within the lung parenchyma, distance from the intersegmental plane and volume of the segments.

Results: In a period of four months, 20 preoperative plans for anatomical sublobar resection were carried out at the same hospital. Most of the lesions were located in the lower lobes (14). After planning, 16 single segmental resections and 4 combined procedures were proposed, 3 bisegmentectomies and one basilectomy. In 5 cases, there was divergence between the planned and the executed procedure. The reasons for changing the procedure were: two benign lesions identified during intraoperative frozen section, one anesthetic complication requiring a shortened surgical time, and two cases encountering technical difficulties in controlling the hilar structures. Changes due to technical difficulties involved a segmentectomy of segment 10 (posterior of the lower lobe) on the right side and an isolated segmentectomy of S1 on the left. Bronchial anatomical variations were present in 75% of the cases (15), with 4 patients (20%) showing the presence of an S6 segment. Arterial distribution showed some anomaly in 80% of the cases, 37% of which were due to early branch origin. There was a case of three separate arteries for S6 associated with the mediastinal lingular artery and individual branches for left S1 and left S2. Two cases had cross drainage between lobes with lingular veins draining into the inferior pulmonary vein. There was complete correspondence between the bronchovascular anatomy reported in the planning and that found intraoperatively in 19 of the 20 cases. In one of the cases, an artery for the left S1 segment that was present in the 3D model was not identified intraoperatively. All lesions had a free surgical margin with a distance equivalent to or greater than the tumor diameter. Postoperatively, the median hospital stay was 3 days with 2 days of chest drainage. One patient had prolonged air leak and two had pneumothorax after chest tube removal, not requiring a new drainage.

Conclusion: There is a high frequency of anatomical variations in segmental bronchovascular anatomy. With the increasing performance of these procedures, surgical planning protocols, such as the one described, help in the identification of anatomical variations, allowing a safe performance of complex cases.



• FT 105

Profile Analysis of Individuals Hospitalized for Heart Failure in Hospitals in Paraná

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Objective: The objective of the study is to identify the profile of individuals hospitalized in the state of Paraná due to heart failure. The esteemed study also seeks to analyze data from five years to find characteristics that stand out in these hospitalizations.

Methods: This is a secondary descriptive epidemiological study, based on hospitalization data for decompensated heart failure in hospitals in Paraná, taken from Department of Informatics of the Brazilian Unified Health System (DATASUS) in the period from 2018 to 2022. The patient profile was analyzed, considering gender, race, and age group. In addition, the east, west, north and northwest macro-regions were also compared. In addition, the data were compared year by year and the most relevant were analyzed, so that the general analysis of the individual's profiles could be carried out.

Results: There were 99,257 admissions for heart failure in the state of Paraná, with a higher prevalence of males (49,637, 50.01%), and (70%) of the admissions (69,139) were for individuals identified as white. The age group with the highest number of hospitalizations was between 70-79 years old, totaling 28,651 (28.9%), but also with a significant increase in the 50-59 age group when compared to the 40-49 age group, totaling an increase of 8,908 (71%) cases, a fact that continues to grow until the age of 80, when the data drops again to 22,437 (22.6%). As for the macro-regions, the eastern region of Paraná stands out with 47,704 (48.06%) hospitalizations. It is noteworthy that 96,114 (96.9%) of the visits were urgent.

Conclusion: Heart failure is a complex clinical syndrome characterized by typical symptoms and/or signs that may be caused by structural or functional cardiac abnormalities, often related to uncontrolled arterial hypertension and diabetes. Therefore, the present study resulted in a more characteristic profile of individuals hospitalized for heart failure, highlighting a prevalence of males, individuals identified as white, aged between 70-79 years, and located in the eastern region of the state of Paraná. A fact that draws attention is a significant increase in the 50-59 age group was when compared to the 40-49 age group, alerting to preventive measures in these patients, thus aiming at reducing future hospitalizations when they reach the age range. Based on the result, it is possible to visualize a very characteristic profile for cardiovascular diseases with a focus on heart failure. In addition, early care in patients with these characteristics can reduce the number of hospitalizations and, consequently, emergency cases in Paraná's hospitals.



• FT 106

Rapid Growing Biphasic Pulmonary Blastoma: A Case Report

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Objective: To report a rare case of biphasic pulmonary blastoma (PB).

Methods: Retrospective observational study with analysis of medical records.

Case Report: A 39-year-old female patient, active smoker (16 pack years), with no other comorbidities, was referred to the thoracic surgery division of a public hospital in Brazil presenting with cough and nocturnal chills for three months, without weight loss or other associated symptoms. External chest computed tomography (CT) showed a mass on the right lower lobe of 9.9x3.0 cm, associated with a small pleural effusion, and a transbronchial biopsy revealed necrosis and cellular debris. We continued the investigation with a transthoracic biopsy, once again showing extensive necrotic tissue. Two months after the first appointment, the patient returned referring progressive dyspnea and hemoptysis. She was hospitalized and a new CT scan revealed the mass had grown to 18.0x13.0 cm, the ipsilateral pleural effusion persisted and the mass had an standardized uptake value of 16.6 on the positron emission CT. Because of mass compression, the patient went into respiratory failure and needed mechanical ventilatory support, followed by veno-venous extracorporeal membrane oxygenation (ECMO) support. A right pneumonectomy was performed using a clamshell approach, with right thoracic cavity packing due to coagulopathy. Three days later, the patient was reoperated for removal of the pads and hemostasis review, with no active bleeding. She went into multiple organ failure and died five days after the second surgery.

Conclusion: Pulmonary blastoma is an extremely rare and aggressive neoplasm, accounting for less than 1% of lung cancers in adults. The risk factors are not fully understood; however, there appears to be a correlation with smoking, as in this case. The most common subtype is the classic biphasic PB. As in our patient, this entity is characterized by the presence of immature epithelial and mesenchymal components resembling fetal lung tissue. Despite its embryologic origin, most cases are diagnosed around the fifth decade of life, often with minimal symptoms and incidental discovery of a large, unilateral, well-circumscribed mass on CT scan. Complete surgical resection is the only known curative therapy for pulmonary blastoma. When evaluating large thoracic masses, clinicians should consider PB as differential diagnosis.



• FT 107

Robotic-Assisted Resection of Intracardiac Tumors: The Brazilian Experience

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Introduction: Untreated benign intracardiac tumors can lead to several complications and the gold standard treatment is complete surgical resection of the mass.

Objective: To describe our experience in robotic resection of intracardiac tumors using the da Vinci Robotic System®.

Methods: In this observational retrospective study, we present a series of nine cases of robotic intracardiac tumor resection, performed between August 2010 and March 2023.

Results: Nine patients, eight female and one male, diagnosed with intracardiac masses, underwent robotic cardiac surgery. Mean weight was 73.1 ± 19.9 kg, mean age was 43.3 ± 20.4 years, and mean tumor size was $2.6 \pm 1.1 \times 2.3 \pm 0.9$ cm. Eight masses were in the left atrium (LA) and one in the right atrium (RA). None of the patients had any cardiac symptoms. The mean cardiopulmonary bypass and aortic cross-clamp times were 145 ± 35 and 94 ± 45 minutes, respectively. Intraoperative TEE confirmed complete mass excision in 100% of the cases, without interatrial shunt or valve dysfunction. All patients were extubated in the operating room. Intensive care unit discharge occurred after 1.5 ± 0.4 days, and total hospital length of stay ranged between 3 and 6 days. The mean follow-up time was of 35.2 ± 16.5 months and the postoperative echocardiogram showed no complications.

Conclusion: Robotic intracardiac tumor resection is a safe and feasible treatment, with excellent surgical results, allowing early return to social and professional activities.



• FT 108

Serum Lactate as a Biomarker of Morbidity and Mortality after Cardiovascular Surgery

Eduarda Elsenbach Scherer, Pablo Roberto Rei Rutkowski, Rui M S Almeida

Objective: The present study aims to analyze blood lactate as a biomarker of morbidity and mortality in patients who underwent cardiovascular surgery, being able to improve attention, care, and possible prevention of adverse events.

Methods: The retrospective, descriptive, bibliographical, and documentary study was carried out through the analysis of medical records of 194 individuals aged between 25 and 82 years who underwent cardiovascular surgery, attended by Hospital São Lucas in the city of Cascavel, Paraná, in the years of 2022 and 2023. We associated serum lactate levels with a total length of stay, intensive care unit (ICU) length of stay, and intra- or postoperative complications, thus analyzing the importance of lactate for the clinical outcome. Data was collected using the Hospital Medical File System (SAME), without requiring an Informed Consent Form (TCLE), as the study analyzed electronic medical records of about 200 hospital patients without direct contact with the participants. The ethics committee requested and approved the waiver of TCLEs under protocol: 68441023.5.0000.5219.

Results: The study carried out an analysis of 194 medical records to evaluate the complications that occurred in patients. Based on these complications, patients were divided into three groups: those who did not have any complications and were later discharged, those who had some complications and were also discharged later, and those who had complications that resulted in death. In the first group, comprising 92 patients without complications, representing 47.4% of the total, the mean length of stay was 10 days, with 3.9 days of stay in the ICU (86 patients). Mean preoperative lactate level was 1.4 (72 samples), increasing to 2.64 postoperatively (91 samples), representing an increase of 88%. The second postoperative sample collected averaged 2.57 (87 samples), showing a 3% decrease from the first sample, and this downward trend continued until patient discharge. In the second group, composed of 80 patients who had some complications, representing 41.2% of the total, the average hospital stay increased to 17 days, that is, 70% more than the group without complications, with an average of 7.2 days of hospitalization in the ICU. The mean preoperative lactate level was 1.72 (67 samples), increasing to 3.3 postoperatively (78 samples), representing an increase of 97%. As in the first group, a progressive decrease was observed in the subsequent samples until the patient's discharge. In the last group, which had complications resulting in death, 22 patients were included, representing 11.3% of the total. The hospital and ICU stays were shorter compared to the second group, with averages of 15 days and 10 days, respectively. The mean preoperative lactate level was 1.61 (21 samples). The postoperative lactate showed an average of 3.63 (22 samples), representing an increase of 125% from the preoperative period. In subsequent samples, there was an increase of 44%, with an average of 5.24 (19 samples), followed by an increase of 4%, with an average of 6.57 (17 samples).

Conclusion: The analysis of the morbidity and mortality of patients undergoing cardiovascular surgery revealed the influence of lactate as a clinical indicator since the results obtained from the analysis of the three groups of patients show significant differences in clinical outcomes and the trends observed concerning intercurrents.



● **FT 109**

Stabilization of Displaced Ribs and Chest Wall Using Titanium Plates without the Use of Screws

Theodoros Karaiskos, Olga Ananiadou, Eirini Asouhidou, Fotini Ampatzidou, Harisios Mavromanolis, Stylianos Poulos, Athanasia Vlahou

Introduction: The treatment of rib fractures as a result of traumatic injury to the chest or during thoracotomy is still conservative in many centers. However, the decision for non-surgical intervention in the acute post-traumatic period is very often associated with complications, due to its ineffective treatment. In addition, there are reports showing that patients who sustained rib fractures and were treated conservatively experienced a subsequent limitation in their daily activities due to persistent chronic pain or chest wall deformity that negatively affected their quality of life.

Methods: From December 2020 to December 2022, 30 patients underwent rib stabilization using Embrace™ titanium wrap plates (Waston Medical, Changzhou, China) without the use of screws.

Results: Out of the 30 patients, 23 suffered a single rib fracture as a result of the thoracotomy and the use of the rib expander, while the remaining 7 patients suffered multiple fractures as a result of injury due to car accident. All patients recovered successfully and were discharged, although the hospital stay of patients with multiple fractures was significantly longer.

Conclusion: Fixation of rib fractures using the specific titanium plates without the use of screws seems to be effective. The placement technique is remarkably simple, fast and reproducible. The stabilization of the fractures is reliable, while the pain and hospitalization time of the patients is significantly reduced as is the risk of infection.



• **FT 110**

Staring into the Abyss: The Need to Develop Innovative Strategies to Sustain Cardiac Care of the Indigent in Southern Africa

Wilhelm Lichtenberg, Timothy Pennel, Blanche Cupido, Nqobile Manzini, Andre Brooks

Cardiac disease is the greatest cause of mortality of non-communicable diseases worldwide. In South Africa, where 85% of 60.6 million population is indigent and wholly dependent on public healthcare, it is the third highest cause of death. In addition to a dire lack of facilities, capacity, knowledge, and expertise, the catastrophically disproportionate physician-to-patient ratio constitutes nothing short of an incipient humanitarian disaster.

Annually, around 13,000 indigent children are born with congenital heart disease (CHD) in South Africa, and roughly a third of these patients require surgery. Of the estimated 4,200 operations required, less than 800 are performed in public health facilities annually. Twenty-eight percent (17 million) of the population of South Africa are under the age of 14, of which 14.4 million are indigent.

There are 24 full-time paediatric cardiologists serving the public sector population, at a physician-to-patient ratio of 1:600,000. Furthermore, with only seven independent congenital cardiac surgeons in the South African public sector (1:2,000,000), it is estimated that it is being served at 6% of the World Health Organization recommendation of 400 operations per 1 million population. The situation in the rest of Sub-Saharan Africa is considerably worse.

Despite several international charities supporting paediatric heart disease worldwide, none of these are active in South Africa. The Young Hearts Africa Foundation (www.youngheartsafrica.org), a duly registered non-governmental organization, was founded in 2021 by a cardiac surgeon in Cape Town to raise funds for indigent children requiring corrective surgery for CHD, whilst at the same time creating additional capacity for teaching and training with a view to additional sustainable programs.

By employing the unique idea of utilizing music to tell stories and create public awareness, the founding surgeon has combined forces with local and international music stars in producing music of award-winning standard. The Red Cross War Memorial Children's Hospital in Cape Town is the only fully functional dedicated paediatric hospital in Africa and is the official paediatric teaching hospital at the University of Cape Town.

Since November 2022, sufficient funds have been secured to enable the hospital to perform one additional operation per week for at least a year, an increase in the hospital's cardiac surgery capacity of approximately 12%. In addition, funds have been procured to address the dire need for additional training to expand cardiology and cardiac surgery programs at this and, in time, other hospitals in South Africa.

Ambitious and innovative fundraising programs are underway to ensure the continuation and expansion of the current highly successful projects. Similar innovative approaches are desperately needed, and collaborative efforts involving societies, corporates and aid organizations worldwide are critical to prevent the tragic loss of young lives on epic proportions.



• FT 111 Sternal Closure Using the Claw Sternum Stabilization System

Theodoros Karaiskos, Antonios Baddour, Olga Ananiadou, Fotini Ampatzidou, Eirini Asouhidou, Stylianos Poulos

Introduction: Although the use of wires is still world-widely the most common method of sternal closure after a conventional heart operation, uncomplicated sternal healing cannot be fully guaranteed. Poor placement of wire sutures, insufficient tightening, tearing of the sternum or wire breakage resulting in sternal dehiscence and deep infection, which are life-threatening complications for the patient. The repair of these complications constitutes additional interventions of increased risk, which greatly affect mortality and hospitalization costs.

Methods: From December 2020 to December 2022, 364 patients underwent cardiac surgery through a midline sternotomy approach in our department. The sternal closure was performed using a system titanium sternum tightening plates, without the use of screws, called the Claw sternal closure system (Waston Medical, Changzhou, China).

Results: Sternum healing was successful in all patients. There was no bleeding, hematoma, or other injury caused by the sternal fixation system, and no device had to be removed because of pain or irritation. Five of the cases required urgent reopening to control intrapericardial bleeding and the plates were quickly removed, and after evacuation of the pericardium, successfully reinserted. No sternal dehiscence was observed in any of the above patient, but there were seven wound infections, all of them managed conservatively with a negative suction (VAC) system. Two of them were deep infections and the sternal plates had to be removed.

Conclusion: The Claw stabilization system reliably ensures stable closure of the sternum. It is easy to place, has a short learning curve and does not increase surgical time. In case of emergent reopening, it is removed very easily and quickly, while it can be repositioned after the end of the operation, without increasing the risk of infection.



• FT 112

Surgical Technique in Pulmonary Thromboendarterectomy with Intermittent Total Circulatory Arrest: A Hospital Experience

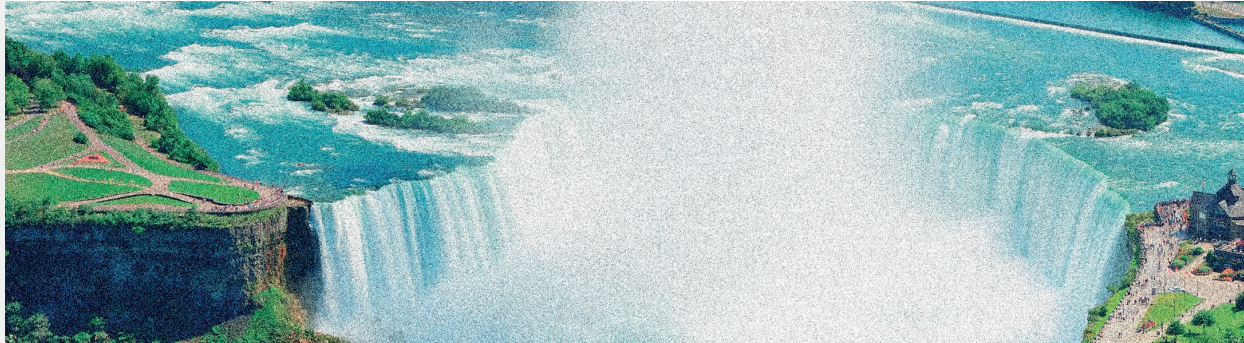
Leonardo Paiva Ohashi, Carlos Alberto Teles, Wallace de Souza Pimentel, Pedro Reges Pereira Meira, Jaquelina Sonoe Ota Orakaki, Luiz Augusto de Andrade Costa, Nelson Americo Hossne Junior, Márjory Medeiro Passos Teixeira, Marcos Cruz Amaral, Matheus Ritto

Objective: Pulmonary thromboendarterectomy is the surgical treatment of choice for cases of chronic pulmonary thromboembolism with hemodynamic compromise of the right ventricle. The surgical approach is complex and requires experienced centers. The aim of this surgery is to reduce pulmonary vascular resistance and to describe the surgical technique employed at a specialized center in São Paulo. Five cases were performed from July to December 2022.

Methods: Our technique consists of a median sternotomy through layers, including pericardial incision. Once the essential structures (aorta, main pulmonary artery, and superior vena cava) are visualized, dissection and separation of the structures are performed. Cannulation of the superior vena cava should occur to enable cannula traction, with movement of the right atrium and superior vena cava laterally, clearing the field of view when approaching the right branch of the pulmonary artery. After cannula placement and initiation of cardiopulmonary bypass (CBP), a right upper pulmonary vein access is positioned for emptying the left chambers. Then, gradual patient cooling begins, and the main trunk of the pulmonary artery is opened, followed by the placement of sutures to improve the field of view of the pulmonary artery and its branches. Dissection of the endothelium through the left pulmonary artery is initiated, with identification of a region described as “pearly white.” Once the plane is visualized, the surgeon switches positions with the assistant for the approach to the contralateral pulmonary artery. Dissection of the of the right pulmonary artery’s endothelium occurs up to the segmental branches, without initiating total circulatory arrest (TCA). However, when blood return through the collaterals and bronchial circulation hinders visualization, the aorta is clamped, and the myocardium is protected using Del Nido cardioplegic solution. Thus, TCA begins with the goal of reaching 18°C.

Results: The mean CBP time is estimated at 159.6 minutes (maximum: 197 minutes; minimum: 126 minutes). The mean cross-clamp time is 80.5 minutes (maximum: 90 minutes; minimum: 65 minutes). The mean TCA time is 43.6 minutes (maximum: 57 minutes; minimum: 32 minutes). There is an average reduction of 60.8% in pulmonary artery pressure in the postoperative period.

Conclusion: Chronic pulmonary thromboembolism is a severe disease that causes significant hemodynamic repercussions and significantly affects the patient’s quality of life. Our report demonstrates that the described surgical procedure is safe and effective, with a significant reduction in pulmonary pressures.



• FT 113

Technical Adaptation of First Rib Resection by VATS for the Thoracic Outlet Syndrome

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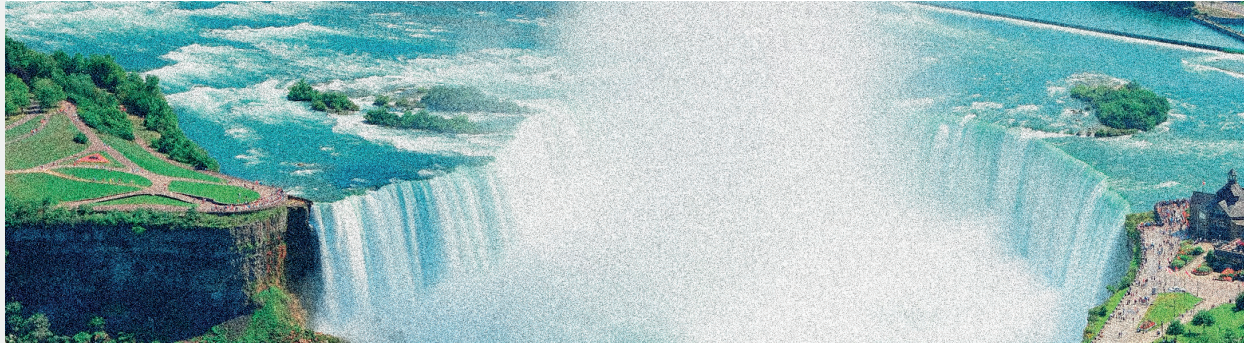
Introduction: Thoracic outlet syndrome (TOS) is the compression of subclavian vessels and brachial plexus at the upper thoracic inlet. Etiologies can be varied, like cervical ribs or transverse mega-apophysis. Surgical treatment is required for vascular TOS and worse symptoms in neurogenic TOS. Several techniques are used for complete first rib resection.

Objective: To present technical modifications to the approach introduced by Ghefter et al. regarding the work incision, hydrodissection, and the use of an ultrasonic bone cutter.

Methods: The procedure was performed on 5 patients with TOS. The median age was 42, and the majority were men. The surgery was indicated in two cases of arterial TOS and in three cases of neurogenic TOS. The surgical technique is performed with the patient under general anesthesia, double-lumen orotracheal intubation, and lateral decubitus. The affected arm is up and positioned extended anteriorly at 90 to 120°. The optical trocar was inserted at the 7th/8th intercostal space at the midaxillary line. The rear port was positioned near to the tip of the scapula. The 3rd port was located in the axillary region close to the first rib (thoroscopically guided). Subpleural needle positioning, and infusion of diluted epinephrine in saline guided by pleuroscopy, ensure hydrodissection, from the 2nd to 1st intercostal space. This separates the parietal pleura from the endothoracic fascia. The extraperiosteal dissection started from the first rib inferior border. The intercostal muscles were detached from the bone by blunt dissection, finger plus periosteal elevators, and division using an ultrasonic device (Harmonic Ace®, Johnson & Johnson Medical N.V., Belgium). The rib section was done in the middle portion, anterior to the subclavian artery in the costoclavicular passage, using the Piezosurgery®. The anterior half of the rib was down-mobilized, and the sternocostal joint was cut. It was possible to identify the subclavian vein, the costoclavicular ligament, and the subclavius muscle. After sectioning, the first half remains fixed superiorly by the anterior scalene muscle, which is pulled together with the bone and sectioned after 3-4 cm extension of its rib insertion. The subclavian artery and the lower brachial plexus roots were identified, and the 2nd half of the 1st rib was pushed down, showing the cervical rib attachment. The posterior cut was performed near the spine, in the rib neck, by the ultrasonic bone cutter. The middle scalene muscle was identified, and sectioned near the edge of the rib. The cervical rib is dissected highest as possible, in a combination of blunt digital dissection, and finally disarticulated.

Results: We have performed 5 cases with good outcomes and no complications. The mean operative time was 2 hours, half an hour faster than the standard approach. All patients had improved symptoms at the 3rd postoperative day. Technical VATS first rib resection modifications meet all requirements as feasibility and good outcomes matched with the minimally invasive approach.

Conclusion: The new technical approach modifies the work incision position, introduces hydrodissection, and the use of an ultrasonic bone cutter. The following advantages have been observed: 1. The apical pleurectomy is easier to perform after hydrodissection. 2. The ultrasonic bone cutter is safer and does not cause injury to subclavian structures. 3. The finger is used for palpation and blunt digital dissection, helping to identify the structures and to detach the rib from the chest wall.



• FT 114 Incidence of Cardiovascular Disease in Pregnant Patients

Gabriela Stefanello Palaoro, Rui Manuel de Souza Sequeira Antunes de Almeida

Objective: The study aims to identify the main cardiovascular diseases in patients during pregnancy, as well as to analyze the incidence of these diseases in the lives of pregnant women and their treatments.

Methods: This is an analytical retrospective study, where articles retrieved from PubMed and Lilacs platforms were reviewed and grouped using inclusion and exclusion criteria. The search terms used were “Cardiovascular Disease” and “Pregnant Women”. The inclusion criteria are based on articles that contain observational, prognostic, and incidence studies, clinical trials and clinical practice guides, which report the main cardiovascular diseases in pregnant women. It will also include articles in Portuguese, English and Spanish, which have full text available and published in the last 10 years. Exclusion criteria are articles based on systematic review articles, meta-analysis, incomplete, written in languages other than those abovementioned, and articles written before the year 2013.

Results: Based on the descriptors “Cardiovascular Diseases” and “Pregnant Women”, 153 articles were found on the PubMed platform, of which 37 met the eligibility criteria and 157 on the Lilacs platform, of which 12 met the eligibility criteria. After reading the articles, it was found that the most affected pregnant women are those of childbearing age, from 15 to 30 years old, with a minimum age of 15 years, mean age of 29.3 years and maximum age of 55 years. Among the main cardiovascular diseases found, we can mention rheumatic heart diseases (44.44%), followed by mitral valve prolapse (39.20%), and acute myocardial infarction (36%). Decompensated heart failure (30.06%), congenital heart diseases (26.17%), arrhythmias (20.74%), and left ventricular dysfunction (5.80%) also deserve to be highlighted. In addition, systemic arterial hypertension (70.62%) prevails as the main risk factor for cardiovascular diseases. The treatments are variable, some of these diseases are resolved with clinical treatment, while others require surgical treatment. Mitral valve prolapses, congenital heart disease, acute myocardial infarction, arterial hypertension and arrhythmias are mostly treated clinically. In situations where the cases are more severe, there is the possibility of surgical treatment, as is the case of mitral valve prolapse, rheumatic heart disease and acute myocardial infarction, in which it is possible to reverse the alterations found in these cardiovascular diseases.

Conclusion: Cardiovascular diseases during pregnancy are closely related to maternal and fetal mortality, and the late diagnosis generates even greater risks. The treatment of these patients was effective both for controlling risk factors and for reducing maternal and fetal mortality.



• FT 115

Use of Wearables in Cardiology: The Revolutionary “Wearing Health”

Victória Suldotski Lucca, Gabriela Stefanello Palaoro, Lara Canato Micheletto, Rui Manuel de Sousa Sequeira Antunes de Almeida

Objective: The objective of this systematic review is to provide an in-depth analysis of the benefits of using wearables in cardiology and its rise in the medical market, and to analyze the possibility of applicability of these technologies in the daily lives of cardiology patients.

Methods: A systematic review of 43 published articles was carried out, referring to the theme wearables in cardiology, and their contributions to the medicine of the future, to analyze the relationship of the medical field with wearable technologies and their benefits in terms of controlling cardiovascular diseases. The search was performed using the PubMed database based on pre-established inclusion and exclusion criteria, with articles published between January 1, 2017 and February 1, 2023. The mandatory descriptor “Wearables Cardiology” was used to the search.

Results: With the initial search for the descriptor “Wearables Cardiology” on the PubMed platform, 806 articles were found, however, a refinement was performed to select only articles written after 2017, as they were more up-to-date. A total of 725 articles were found and, among these, 43 met the eligibility criteria. Based on these articles, it can be inferred that wearable health devices have numerous potential applications, such as the continuous monitoring of cardiovascular diseases, such as atrial fibrillation, arrhythmias, and heart failure. However, there are still technical challenges to be overcome for its full implementation in the health system, such as connectivity, battery life, and signal quality, which, when solved, could go far beyond remote and continuous monitoring of patients with heart disease. In addition, wearables have a relevant ability to reduce health costs, while minimizing unnecessary hospitalizations and enabling better treatment due to the effectiveness of early detection of cardiac disorders.

Conclusion: It is understood that wearables are important devices in the rise of telehealth and the market for these wearable technologies has shown great progress and effectiveness, especially when it comes to reducing the costs of unnecessary recurrent hospitalizations. Wearable technologies are gradually becoming more specific for the prevention and diagnosis of a wide range of cardiovascular diseases. Therefore, the question is not if, but when, wearables will become part of each individual's health system.



• FT 116

Analysis of the Epidemiological Profile and Quality of Life in Patients after Aortic Valve Transcatheter Implant Procedure (TAVI) in a City in the Western Region of Paraná

Louise Bergo Campaner, Anderson Roberto Dallazen, Rui M. S. Almeida

Objective: The present study aimed to describe the epidemiological profile of patients who underwent treatment for aortic stenosis through transcatheter aortic valve implantation in Cascavel, Paraná, Brazil.

Methods: This was a descriptive, retrospective observational study in which we collected personal information about the quality of life of patients interviewed before and after the transcatheter aortic valve implantation (TAVI) procedure. Data were obtained from private hospital networks in Cascavel, Paraná (Hospital São Lucas and Instituto de Cirurgias Cardiovasculares do Paraná – ICCOP). Data collection initially involved telephone interviews with patients who underwent the procedure. Inclusion and exclusion criteria included patients of both sexes, aged between 60 and 95 years. The final sample consisted of 22 eligible participants who were interviewed and provided informed consent. Questions were asked about well-being before and after treating aortic stenosis and the symptoms experienced.

Results: There was a significant improvement in quality of life and excellent outcomes following the procedure. The mean age of the interviewed patients was 79 years. In the sample, 76% had hypertension, 55% had chronic arterial disease, 45% had dyslipidemia, and 30% had heart failure. Before the transcatheter aortic valve implantation procedure, 77.3% of participants reported being unable to perform daily activities without physical limitations such as fatigue, shortness of breath, weakness, or pain. After the procedure, 95.4% (n=21) reported feeling well, and 63.6% (n=14) reported lifestyle changes, such as being able to ambulate quickly (“I can walk normally without needing to stop or catch my breath like before”). Additionally, 36.4% (n=8) reported improvement but still experienced some pre-existing symptoms (“I can walk without as much discomfort, but when I walk long distances, I still experience symptoms such as shortness of breath and/or chest pain and/or dizziness”). Regarding daily activities, 90.9% confirmed the return to their regular routines. After the procedure, 36.4% (n=8) reported feeling very satisfied, and 59.1% (n=13) reported being satisfied. On a scale of 0 to 5 for symptom improvement, 50% (n=11) reported a very significant improvement, 36.4% (n=8) reported a significant improvement, and 13.6% (n=3) reported a moderate improvement. Finally, all participants stated that the procedure was a good option for their treatment, and they all noticed a change in their quality of life.

Conclusion: Despite the positive results obtained in this research, the economic issues related to the cost of treatment remain an important factor to address. It was evident that, although TAVI has a higher cost than surgical replacement of the aortic valve (SAVR), which has been an obstacle to its widespread use, studies and demonstrations show that this cost is diluted over time. The budgetary impact could be higher due to being eligible for only a few patients. Finally, most of the interviewed patients had a favorable outcome with improvements in certain cardiological aspects, leading to an improvement in the quality of life of these affected patients. However, further studies are needed to prospectively analyze the progress of these patients for a better understanding of potential complications and their impact on their quality of life.



• FT 117

Aortic Chordae Tendineae: A Rare Cause of Aortic Regurgitation

Javier Dario Garzon Rodriguez, Felipe Noriega, Karen Andrade, Marietta Juan, Tatiana Ramirez, Natalia Mesa, Juan Bernardo Benedetti

Introduction: Aortic regurgitation (AR) is the fourth most common valvular disease in the world. Aortic chordae tendineae, also referred as “fibrous strands”, are rare congenital anomalies considered a type of aortic valve malformation. This condition was first reported in 1981 and it has been described as a rare cause of chronic or acute AR. Echocardiography is a useful exam that can provide helpful information about the severity and mechanism of the AR. The treatment for patients with severe AR is aortic valve replacement. Aortic valve repair is an option in centers of expertise only if the valvular anatomy is suitable for repair.

Case Report: A 63-year-old patient with history of arterial hypertension, diabetes mellitus type 2 and supraventricular tachycardia ablation underwent a transesophageal echocardiogram (TEE) as part of the follow-up for aortic regurgitation. The TEE showed a severe AR and a linear image that could correspond to an aortic dissection. Due to this finding, the patient was referred to the emergency department. Computed tomography angiography (CTA) showed a linear image from the aortic wall to the non-coronary sinus that could correspond to an aortic dissection limited to the aortic root. Three-dimensional transesophageal echocardiogram showed a preserved left ventricular ejection fraction (56%), with a moderate dilated left ventricle. Additionally, an evident linear image was observed from the sinotubular junction to the right coronary cusp, leading to the prolapse of this cusp to the left ventricle outflow tract, with an eccentric severe AR. Based on these images, the patient was diagnosed with a ruptured fibrous strand and a surgical aortic valve replacement was performed. Intraoperatively, a fibrous strand was found between the non-coronary cusp and the Valsalva aortic roof. The aortic valve was replaced with a 23 mm biological prosthesis. The patient was discharged home 7 days after the surgical procedure.

Discussion: Aortic chordae tendineae, also referred as “fibrous strands”, are rare congenital anomalies first reported in 1981. These strands are thought to be embryonic remnants of the cusp formation process at an early stage in the aortic valve formation. The cause of fibrous strand formation remains unclear; however, it is thought to be related to genetics. Physiologically, the strands provide support to the aortic valve coaptation; any alteration of their state, such as increased or decrease stress, perforation or aortic dilatation, can cause acute or chronic AR. Two mechanisms have been suggested to AR related to fibrous strand: rupture of the strands resulting in the loss of aortic valve coaptation, and tenting of an aortic valve cusp leaflet due to aortic root dilatation.

Conclusion: Echocardiography plays a key role in the diagnosis of this pathology, with TEE proving particularly sensitive in assessing location, number and state of the chordae tendineae. Surgical aortic valve replacement is the most frequent treatment in this AR etiology, even though aortic valve repair can be feasible in this type of patients.



• FT 118

Aortic Valve Replacement by Neocuspidization Using Autologous Pericardium (Ozaki Technique) in Adults

Enrique Seguel Soto, Gustavo Barril Merino, Rodrigo Reyes Melo, Roberto González Lagos, Aleck Stockins Larenas, Felipe Figueroa Niklitschek, Fernando Rodríguez Rojas

Introduction: The ideal substitute for the aortic valve in the young population does not exist. Mechanical prostheses require anticoagulation and biological alternatives suffer from degeneration in the medium and long term. Neocuspidization of the aortic valve described by Dr. Ozaki, in Japan, is a technique that uses the patient's pericardium to make the aortic leaflets in a standardized way, using sizers and templates (AvNeo®). This technique could be an alternative for aortic valve replacement in this population.

Objective: To describe the technique and to evaluate the operative and short-term results of adult patients who underwent aortic valve replacement with autologous pericardium using the Ozaki technique.

Methods: Prospective study of patients who underwent aortic valve neocuspidization between March 2019 and March 2023 at the Guillermo Grant Benavente Hospital in Concepción, Chile (n=38). All surgeries were performed by median sternotomy. A sheet of anterior pericardium was resected, cleaned, and fixed in 0.6% glutaraldehyde. Patients were connected to cardiopulmonary bypass, the heart was protected, and the valve resected. The commissures were measured with the sizers and the neocusps were drawn according to the template AvNeo®. The leaflets were cut individually and sutured to the aortic annulus using continuous 4-0 prolipropilene suture, reinforcing the corners with pledges. The result was evaluated with intraoperative echocardiogram. Operative results, survival, need for reinterventions, and clinical and echocardiographic results were evaluated until April 30, 2023.

Results: The study included 27 male patients, with an average age of 51.6 years (19±80 years). The valvular pathology corresponded to stenosis in 31 cases and regurgitation in 7 cases; 6 patients had active endocarditis and 2 had previous aortic surgery. Among the cases, 22 valves were bicuspid. In patients with stenosis, the mean transvalvular gradient was 48.5±18 mmHg. The average left ventricle ejection fraction was 55.6±12.6%. There were 5 associated surgeries. Aortic clamp and cardiopulmonary bypass times were 101±23 and 107±23.1 minutes, respectively. There were no conversions to prosthetic replacement. The postoperative echocardiogram showed good valve morphology, low gradient, and no regurgitation in all cases. There was no operative mortality. The mean follow-up was 14.9±12.1 months. There were no deaths. Three patients presented significant aortic regurgitation. There were 2 reinterventions (valve replacement with biological prosthesis) at 2 and 4 months.

Conclusion: Neocuspidization of the aortic valve is a reproducible technique with good clinical and echocardiographic results in the short term. It could be an alternative in the treatment of aortic valve disease in selected patients.



• FT 119

***Aspergillus* Fungal Endocarditis in Native Valve**

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Introduction: Fungal endocarditis is a rare condition with high mortality. The most frequent etiology is *Candida albicans*, followed by *Aspergillus fumigatus*. However, cases of native valve endocarditis due to *Aspergillus* are very rare and few cases have been described in the literature.

Objective: We aim to report a case of endocarditis caused by *Aspergillus fumigatus* in a native valve.

Case Report: Medical record consultation was performed to collect information about the case. MAMP, female, 78 years old, after sudden low visual acuity, sought ophthalmological care in September/2021. After treatment for toxoplasmosis, without improvement, she returned after three weeks. Ophthalmological examination showed ocular inflammation with hypopyon (1 mm), vitreitis and a white lesion in the right eye. Fungal infection was questioned and treatment with fluconazole 150 mg BID was started in October/2021, with a proposal for an ocular biopsy and investigation of a primary endogenous focus. Transthoracic echocardiogram showed a suggestive image of vegetation in the mitral valve. She was referred to the Coronary Unit after the exam, and the antifungal was changed to amphotericin B, combined with meropenem and vancomycin. Previously hypertensive, the patient was hospitalized in May/2021 due to cecal volvulus in the countryside of the state. She underwent open surgical approach with appendectomy and right colectomy with ileocolonic side-to-side anastomosis. The previous hospital stay lasted approximately 30 days, with nonspecific reports of several clinical complications and several cycles of antimicrobials. A transesophageal echocardiogram performed in October/2021 revealed a vegetation measuring 15x13 mm, along with valve perforation with severe mitral regurgitation. As a result, the patient was submitted to mitral valve replacement on October 10th. She had a low output in the early postoperative period, with suspension of dobutamine on 2nd postoperative day (POD). She was discharged from the CTI on the 3rd POD. Despite negative blood cultures, she developed septic shock and respiratory failure, accompanied by pulmonary infection, evolving with multiple organ dysfunction and refractory shock, with death on the 17th POD. Mitral valve culture revealed abundant growth of *Aspergillus fumigatus*.

Conclusion: Native valve endocarditis due to *Aspergillus* is rare and has a high mortality rate. Diagnosis can be challenging due to the low percentage of positive blood cultures. In our case, valve culture was essential for defining the etiology.



• FT 120

Biomarkers to Predict Outcomes after Surgical Aortic Valve Replacement or Repair

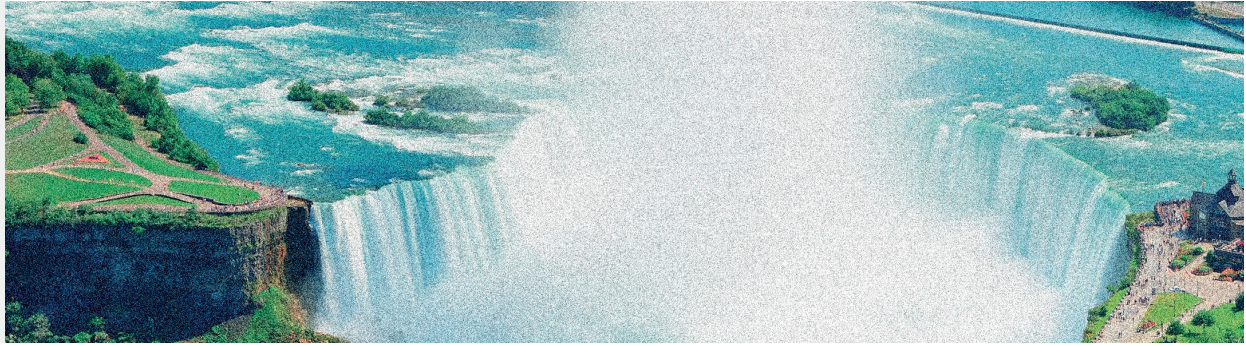
Till Joscha Demal, Alina Goßling, Oliver Bhadra, Niklas Schofer, Moritz Seiffert, Stefan Blankenberg, Hermann Reichenspurner, Lenard Conradi, Andreas Schäfer

Introduction: Prediction of postoperative complications after cardiac surgery is challenging. Besides established risk stratification tools (e.g. EuroSCORE, STS score), preoperative determination of blood biomarkers gains increasing importance and may be helpful to estimate postoperative adverse outcomes. To further elucidate this topic, we herein aimed to correlate preoperative biomarkers with postoperative complication rates after surgical aortic valve replacement or repair (SAVR).

Methods: Patients undergoing SAVR were prospectively imputed into a dedicated registry after informed consent. Exclusion criteria were concomitant replacement of the ascending aorta or the Ross procedure. Patients underwent routine preoperative sampling of these biomarkers: hemoglobin, creatinine, high-sensitive troponin I, GOT, GPT, INR, CRP, and NTproBNP. Biomarker levels were correlated with postoperative complication rates. Correlations were adjusted for EuroSCORE II using logistic regression analysis. Outcome parameters were adjudicated according to VARC-3 definitions. For the regression analysis, all biomarkers except hemoglobin were log-transformed due to skew distributions.

Results: Between March 2018 and October 2021, 377 consecutive patients met inclusion criteria and were analyzed (median age 66.4, IQR 56.9-74.1), with 262 out of 377 (69.5%) being male. The median EuroSCORE II was 5.0 (IQR 1.7-67.0). Endocarditis was the indication for surgery in 59 out of 377 (15.6%) patients. Valve replacement and repair were performed in 350 out of 377 (92.8%) and 18 out of 377 (5.1%) patients, respectively. Concomitant coronary artery bypass grafting and/or mitral/tricuspid valve repair were performed in 34.0% (n=128/377). Overall 30-day mortality was 3.7% (n=14). In endocarditis, 30-day mortality was 15.2% (n=9). Postprocedural stroke was found in 2.7% (n=10). Bleeding type 3/4 and postprocedural pacemaker implantation rates were 3.5% (n=13) and 9.1% (n=34), respectively. The combined 30-day VARC-3 endpoints early safety and clinical efficacy were reached in 73.4% (n=276) and 93.6% (n=350), respectively. Preoperative hemoglobin (OR 0.70; 95% CI: 0.55, 0.90, $P=0.0049$), creatinine (OR 3.44; 95% CI: 1.09, 10.86, $P=0.035$), high-sensitive troponin I (OR 1.52; 95% CI: 1.12, 2.07, $P=0.0068$), GOT (OR 2.55; 95% CI: 1.12, 5.77, $P=0.025$), GPT (OR 2.74; 95% CI: 1.71, 4.38, $P<0.001$), INR (OR 4.64; 95% CI: 1.17, 18.37, $P=0.029$), CRP (OR 2.33; 95% CI: 1.58, 3.45, $P<0.001$), and NTproBNP (OR 2.11; 95% CI: 1.30, 3.41, $P=0.0025$) were all significant and independent predictors for 30-day mortality. Furthermore, all these biomarkers predicted the combined endpoints of early safety and clinical efficacy. Bleeding type 3/4 was only predicted by high-sensitive troponin I (OR 1.36; 95% CI: 1.00, 1.85, $P=0.046$) and not by INR (OR 2.57; 95% CI: 0.47, 14.13, $P=0.280$). None of the tested biomarkers independently correlated with postoperative stroke.

Conclusion: This analysis identified several biomarkers that, independently from EuroSCORE II risk stratification, predict postprocedural outcome after SAVR in terms of mortality and clinical efficacy. We cautiously assume that these biomarkers may indicate baseline cardiac and/or end-organ injury. Noteworthy, high-sensitive troponin I was predictive for postoperative bleeding events. Combined stratification models of these biomarkers with EuroSCORE II should be evaluated in further studies to improve predictive value.



• FT 121

Disinsertion of the Posterior Cusp of the Mitral Valve as an Access Route for Sections of the Retractable Chordae Tendineae

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Objective: To present a new surgical access option for sectioning the retractable chordae tendineae of the posterior leaflet of the mitral valve.

Methods: Presentation of four cases of double rheumatic mitral lesion in NYHA functional class III who underwent mitral valve repair surgery using the new access option. The technique consists of disinserting the posterior cusp of the mitral annulus as an access route for sectioning the retractable chordae tendineae of the left ventricle connected to the middle/central part of the posterior cusp of the mitral valve, thus keeping them attached to the papillary muscles and to the free border of the posterior cusp of the mitral valve. In this way, the posterior leaflet regains its normal mobility.

Results: Patients who underwent this new surgical access option for sectioning the retractable chordae tendineae evolved without heart murmurs in the immediate postoperative period and were discharged in good clinical condition.

Conclusion: The new surgical option for sectioning the retractable chordae tendineae proved to be easy to apply in the mitral valve reconstructive surgical treatment to release the posterior leaflet in its full mobility.



• FT 122

Early Outcome of Endoscopic Mitral Valve Surgery in Elderly Patients: A High-Volume Single-Center Experience

Jonas Pausch, Oliver Danile Bhadra, Hermann Reichenspurner, Lenard Conradi

Objective: Despite the increasing use of percutaneous, transcatheter approaches, endoscopic mitral valve surgery (MVS) remains the gold standard for treatment of mitral regurgitation. Nevertheless, as perioperative risk increases with age, MVS outcome in elderly patients is uncertain.

Methods: Between 2015 and 2021, a total of 726 consecutive patients underwent fully endoscopic MVS at our institution. Patients were treated endoscopically using a limited right-sided anterolateral skin incision and 3D-camera visualization. According to their age at the time of surgery, patients were categorized as above (elderly group, n=80) or below (control group, n=646) 75 years. Preoperative characteristics and periprocedural outcome were retrospectively analyzed.

Results: Within patients in the elderly group (e.g., median age of 78.0 [76-80] years vs. 59.5 [52-66] years in the control group; $P<0.001$), the prevalence of arterial hypertension, diabetes, coronary artery disease and atrial fibrillation (AFib) was increased (all $P<0.001$). Despite a higher prevalence of NYHA class III/IV symptoms and a lower left ventricular ejection fraction within the elderly group, preoperative serum levels of natriuretic peptide were similar between groups. The rate of mitral valve repair was 87.5% within the elderly group versus 93.2% within the control group ($P=0.067$). Atrial ablation and closure of the left atrial appendage were more frequently performed within the elderly group, whereas the rate of concomitant tricuspid valve repair was similar (11.3% vs. 7.4%; $P=0.231$). Axillofemoral perfusion was more frequently used within the elderly group (33.8% vs. 3.7%; $P<0.001$). Conversion rates to full sternotomy were favorably low within both groups (5.0% vs. 2.2%; $P=0.126$). Postoperative complications including pacemaker implantation (3.8% vs. 1.9%), occlusion of circumflex coronary artery (0% vs. 0.8%), rethoracotomy (10% vs. 8.7%), right heart failure (1.25% vs. 1.7%), and low cardiac output (5% vs. 3.4%) were favorably low within both groups. Furthermore, 30-day mortality was 1.2% vs. 0.6% ($P=0.444$).

Conclusion: Despite an increased prevalence of outcome-relevant comorbidities and surgical risk, perioperative outcome of patients above 75 years undergoing endoscopic MVS is favorable. Therefore, in addition to transcatheter approaches, endoscopic MVS is a valuable therapeutic option for elderly patients and should be taken in consideration during routine heart team discussion.



• FT 123

Incidence and Risk Factors for Permanent Pacemaker Implantation Following Transcatheter Aortic Valve Implantation: A Brazilian Single-Center Experience

João Victor Tavares Mendonça Garretto, Matheus Ferber Drumond, Raquel Reis Soares, Bráulio RGM Couto, Vinicius Dinelli Guimarães, Elisa Soares Ferber, Guilherme Guimarães Medrado de Castro, Camila Barbosa de Paula, Arthur Soares Lima, Leonardo Ferber Drumond

Introduction: Transcatheter aortic valve implantation (TAVI) has emerged as a viable alternative for patients at intermediate or high risk for surgery. Despite advances in the procedure, the occurrence of irreversible new-onset atrioventricular and interventricular conduction block remains a prevalent complication following TAVI.

Objective: This analysis aims to investigate the incidence of permanent pacemaker implantation (PPI) after TAVI and to explore the factors that influence its occurrence.

Methods: We present a retrospective cohort study, including a 110 TAVI patients operated in a Brazilian single center between 2018 and 2023. The TAVI procedures utilized Medtronic Evolut Pro and Evolut R self-expanding prostheses. Inclusion criteria consisted of patients aged over 75 years with severe aortic stenosis and a Society of Thoracic Surgeons (STS) score indicating a mortality risk exceeding 8%. Patients with preexisting permanent pacemakers and those who had previously received aortic bioprostheses were excluded from this analysis. After applying the exclusion criteria, statistical analysis was performed with a sample of 91 patients. The incidence of permanent pacemaker implantation (PPI) after TAVI was calculated by using point estimates and a 95% confidence interval. Univariate analysis was utilized to identify risk and protective factors for PPI. Categorical variables were compared using the chi-square test, and continuous variables using the Student's t-test, considering a significance level of 5%.

Results: We analyzed a sample of 91 patients who underwent TAVI, with 43 female patients (47%) and 48 male patients (53%). The patients' average and median age were 83 years (standard deviation [SD]=6.3), ranging from 75 to 100 years. Among the patients who underwent TAVI, 14 patients required PPI after the procedure, which accounts for 15.4% of the total sample. The 95% confidence interval for the proportion of patients requiring pacemaker implantation after TAVI was estimated at 8.7%-24.5%. Three risk factors for PPI were identified: age (PPI+average age of 86 years – SD = 5.7; PPI+average age of 83 years – SD=6.3; $P=0.047$), atrial fibrillation/flutter (Relative Risk [RR]=5.3; $P=0.002$), and previous syncope (PPI RR=3.2; $P=0.028$).

Conclusion: The PPI after TAVI is an important complication that has been reduced with the evolution of techniques and materials. Therefore, it is essential to detect preoperative and intraoperative risk factors to implant the permanent pacemaker when necessary.



• FT 124

Long-term Durability of Mitral Valve Repair Surgery for Degenerative Regurgitation

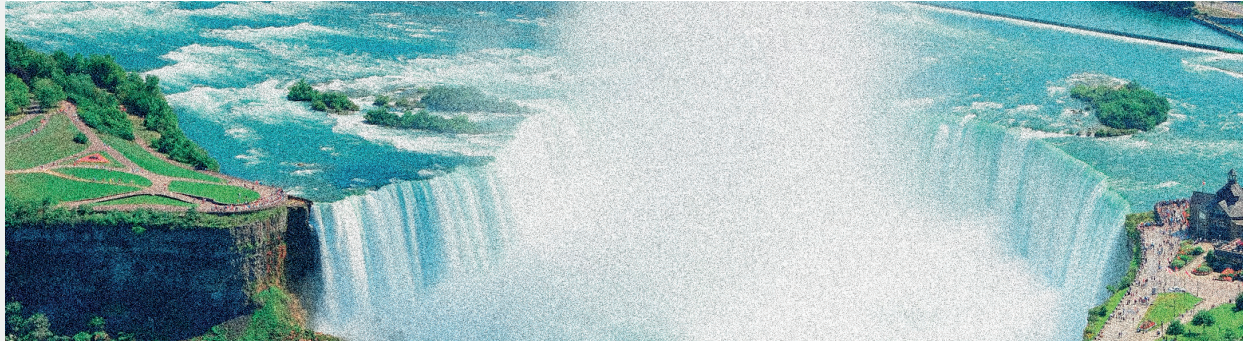
Daniel Navia, Florencia Castro, Martin Vivas, Rodrigo Campis, Mariano Vrancic, Mariano Camporrotond, Fernando Piccinini, Juan Espinoza

Objective: The aim of this study was to evaluate long-term results of degenerative mitral regurgitation (MR) repair.

Methods: Between January 2008 and December 2019, 457 patients (mean age 64.9 ± 12.2 years; 61.1% men) with severe MR underwent mitral valve repair. Median follow-up was 3.0 years (IQR 4.1 years) and was completed in 98.7% of patients. Periodic echocardiographic studies were performed, and long-term survival, recurrence rate of moderate to severe MR and the need for reintervention were analyzed.

Results: At the 10-year follow-up, long-term survival was high, without significant differences according to the affected leaflet: posterior leaflet $95 \pm 2.1\%$, and anterior leaflet $94 \pm 2.2\%$ ($P=0.54$). Patients with preoperative NYHA functional class III/IV ($n=142$) presented higher mortality at follow-up: $13.9 \pm 4.1\%$ versus $2.7\% \pm 1.2\%$ ($P=0.001$). The risk of recurrence for moderate to severe MR at the end of follow-up for the total group of patients was $14.6 \pm 4.3\%$ and freedom from recurrence according to the affected leaflet was high, without significant difference: posterior leaflet $90 \pm 3.4\%$ and anterior leaflet $80 \pm 8.5\%$ ($P=0.97$). Finally, the need for reoperation in post-repair follow-up was $4.7 \pm 3.3\%$

Conclusion: Long-term survival after mitral valve repair is high and the need for reoperation is infrequent. There is a progressive increase in MR recurrence at the long-term follow-up.



• FT 125

Mitral Stenosis as a Sequel of Rheumatic Fever: A Literature Review on Current Interventional Approaches

Luiz Antonio Martens Mokfa, Maria Eduarda Marafon, Kamila Cristina Moreira Spironello, Ana Rafaela Guerrieri de Melo, Luiza Orth, Isadora Cassol Zancanaro, Eloisa Gonçalves Brito, Michelly Tressoldi, Diogo Cunha Lacerda

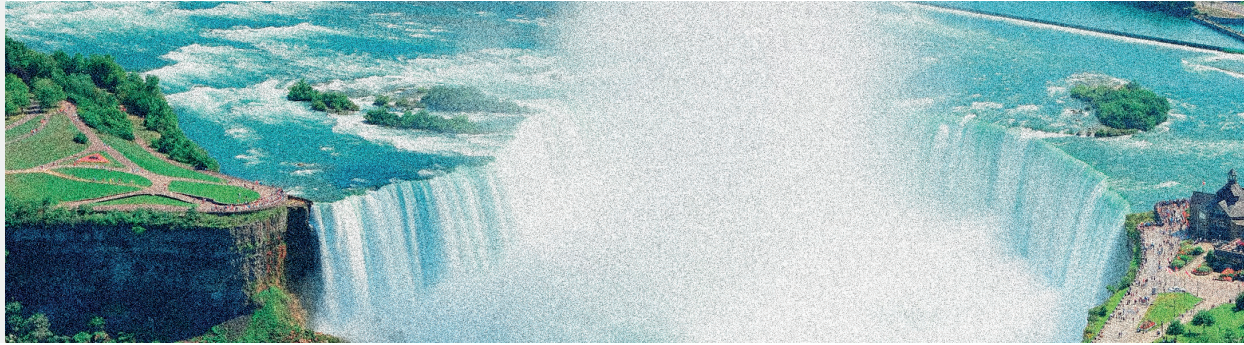
Introduction: Rheumatic fever is a disease that mainly affects children and young adults in regions of low socioeconomic status, being considered a non-suppurative evolution of pharyngotonsillitis caused by group A B-hemolytic *Streptococcus*. The etiopathology is unknown, but it is related to genetic predisposition and the host's immune system. About 25% of patients with rheumatic heart disease have mitral stenosis and approximately 40% have mitral stenosis together with mitral insufficiency.

Objective: This article aims to analyze the therapeutic approaches used for the treatment of mitral valve stenosis resulting from rheumatic fever.

Methods: A literature review, whose articles were selected for the preparation of an analysis on current approaches to rheumatic fever and its involvement of the mitral valve. Articles were selected from the following platforms: Science Direct, Scientific Electronic Library Online (SciELO), and Brazilian Journal of Health Review (BJHR).

Results: In general, drug treatments (beta-blockers, anticoagulants, among others) are utilized both for symptoms and as a bridge to more interventional treatments. The therapeutic approach must be individualized for each case, depending on the degree of involvement and the patient's symptoms. It has been proven that the interventional approach is the most effective in reducing symptoms and increasing patient survival, being indicated for symptomatic patients (NYHA class II, III and IV) with moderate to severe mitral stenosis. Percutaneous balloon valvuloplasty is indicated for patients with moderate to severe mitral stenosis with favorable morphology (Block score ≤ 8) but requiring no thrombus in the left atrium or the presence of moderate to severe mitral regurgitation. In addition, it is well indicated for asymptomatic patients or patients with pulmonary hypertension. In cases of intra-atrial thrombus after anticoagulation or when percutaneous valvuloplasty is not available, surgical open commissurotomy should be the therapy of choice. Finally, only when there is no availability of surgery with cardiopulmonary bypass or percutaneous methods, closed commissurotomy should be chosen. Valve replacement is mandatory for patients with a high Block score (≥ 12), calcified valve, concurrent moderate to severe mitral regurgitation (double lesion) or associated coronary artery disease (CAD) requiring revascularization. Obviously, the presence of valve prosthesis (biological or mechanical) becomes a possible complicating factor, however, the results are still very good, in all scenarios. Patients with a Block score between 9 and 11 must be decided between the procedures according to surgical risk, comorbidities, patient preferences, costs and other characteristics, all individually.

Conclusion: Percutaneous balloon valvuloplasty has grown and spread as a treatment method in recent years, but valve replacement still has a large space, being the method of choice in more advanced cases of the disease. Open or closed commissurotomy are also methods that have their indications and can be alternatives. Finally, studies showed that the success of these interventions and the reduction in complications are influenced by the experience of the team performing the described techniques and the availability of structure for a good execution.



• FT 126

Repair *versus* Mitral Valve Replacement: Early Degeneration of Mitral Valve Repair in a Patient with Systemic Lupus Erythematosus

Diego Maia Martins, Paulo Chaccurrn, Luis Fernando Carmona Cesar Portugal, Sarah Maria Nunes Gadelha, Igor Gomes Cristo, Mauro Henrique Batista Camacho, Pamela Sacalina Camargo, Dayara Hoffmann Mayer, Bruno Mamede Lins Brasiliense, Daniel Robert Alexander

Objective: To describe the case of a patient with systemic lupus erythematosus (SLE) who underwent reoperation for mitral valve replacement and tricuspid valve repair after 2 years of degeneration from the mitral valve repair.

Methods: A female patient, diagnosed with SLE in 2017, presented mitral insufficiency due to Libman-Sacks endocarditis in 2021. She underwent mitral valve repair using the sliding and annuloplasty technique. The post-repair result was satisfactory, showing a maximum diastolic gradient of 10 mmHg and an average of 5 mmHg, a flow orifice of 1.5 cm², and minimal central insufficiency. In the late postoperative period, the patient had several intercurrents, such as COVID-19, bronchopneumonia, aliphatic cholecystitis, vascular complications and reactivation of lupus activity, in addition to lupus nephritis, requiring hemodialysis. Echocardiogram conducted in January 2023 revealed a mitral valve with an appearance of plasty of its posterior leaflet, a maximum diastolic gradient of 18 mmHg and a mean of 9 mmHg, a valve area of 2.7 cm², with significant insufficiency and an eccentric jet directed to the interatrial septum, in addition to moderate tricuspid regurgitation. Pulmonary systolic pressure was estimated at 50 mmHg.

Results: In January 2023, a reoperation was performed for mitral valve replacement, implantation of a bioprosthesis (patient's choice), size 31, and tricuspid plasty with leaflet centralization. Cardiopulmonary bypass and cross-clamp times were 120 and 87 minutes, respectively. The patient was admitted in the immediate postoperative period under light sedation, on mechanical ventilation, and extubation was promptly achieved. She received dobutamine 3 mcg/kg/min, with effective weaning. Continuous dialysis was followed with a flow rate of 30 mL/h. The patient evolved hemodynamically stable, without intercurrents, with the mitral prosthesis in a normal functioning position, maintaining nephrological follow-up with dialysis and hematological follow-up with correction of pancytopenia and indication for anticoagulation.

Conclusion: The prevalence of cardiovascular disease in patients with SLE is estimated at over 50%. The mitral valve is usually the most affected, with a predominance of insufficiency. Severe leaflet thickening, vegetations (endocarditis), calcification, insufficiency, and some degree of stenosis (<5%) have been described. SLE and lupus nephritis can accelerate structural valve deterioration due to calcium and phosphate metabolism abnormalities. Mechanical prostheses can be used, with a wider INR target. Individualization of cases is paramount, and monitoring of disease activity helps to prevent valve deterioration in cases involving native valve or bioprosthesis.



• FT 127

Surgical Explant Following Transcatheter Valve-in-Valve Aortic Valve Replacement: A Case Report

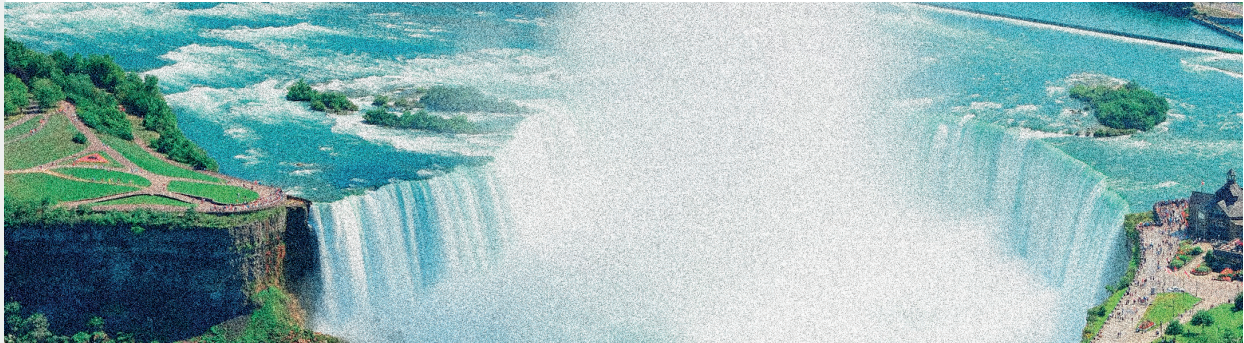
Daniel Robert Alexander, José Honório de Almeida Palma da Fonseca, Carlos Alberto Teles, Nelson Rodrigues Branco, Guilherme Flora Vargas, Diego Maia Martins, Igor Gomes Cristo, Bruno Mamede Lins Brasiliense, Enio Buffolo

Objective: To describe a case report of surgical explant after transcatheter valve-in-valve transcatheter aortic valve replacement (ViV TAVR).

Case Report: Male patient, 77 years old, with prior medical history of previous CABG due to ischemic heart disease, hypertensive disease, and surgical aortic valve replacement (SAVR) with a biological prosthesis and supracoronary tube eight years ago. In consequence of prosthesis dysfunction, he underwent ViV TAVR 2 years ago. Approximately one month ago, the patient presented dyspnea on moderate exercise, with progressive deterioration, admitted in New York Heart Association (NYHA) class III. Transthoracic echocardiogram (TTE) evidenced biological aortic valve endoprosthesis valve-in-valve with severe double dysfunction. After Heart Team discussion, conventional AVR was indicated.

Results: Two biological prostheses were identified in the aortic position: a self-expanding transcatheter heart valve (Evolut R Medtronic) with a perforation in one of the leaflets and a biological biological prosthesis (Mosaic Medtronic) with intense calcification. The nitinol framework of the transcatheter prosthesis displayed circumferential neoendothelialization to the aortic root, requiring careful dissection to avoid structural damage to the aorta. Both prostheses were explanted and subsequent aortic valve replacement was performed with a rapid deployment valve (Intuity Edwards) size 27. The cardiopulmonary bypass time was 90 minutes and the aortic clamping time was 60 minutes. The patient was referred to the intensive care unit and evolved without clinical intercurrents in the postoperative period. Control transthoracic echocardiography (TTE) confirmed the presence of a biological prosthesis in a normofunctioning aortic position, with a mean systolic gradient of 4 mmHg. He was discharged from the hospital on the 8th postoperative day, and the 6-month follow-up showed improvement of NYHA functional class.

Conclusion: The ViV TAVR explant is a rare complication, but its clinical impact is substantial. The associated surgical risks are not negligible and should be considered in the lifetime management of aortic stenosis. Given the increasing utilization of TAVR and ViV TAVR in recent years, awareness of complications and the challenge of surgical management may guide surgical maneuver.



• **FT 128**

Surgical Management of Asymptomatic Patients with Severe Mitral Regurgitation: Clinical Practice Based on Guidelines

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Introduction: Mitral valve repair is considered the gold standard for mitral regurgitation and is recommended by the main guidelines in the management of diseases of the mitral valve apparatus, even in asymptomatic patients.

Objective: The aim of this study is to evaluate the risk-benefit ratio of mitral valve repair in patients with severe mitral regurgitation who are either asymptomatic or exhibit mild symptoms.

Methods: From June 2010 to January 2021, 266 patients underwent surgery to correct isolated primary mitral regurgitation. Out of the total, our study focused on a subgroup of 51 patients in New York Heart Association (NYHA) class I and isolated mitral regurgitation grade 3-4.

Results: The mean age was 56.53 ± 14.44 years. The main causes of mitral insufficiency were degenerative in 48 (94.12%), Barlow in 2 patients (3.92%) and rheumatic disease in 1 patient (1.96%). Leaflet prolapse was the mechanism responsible for regurgitation in 93% of cases (47/51) and, of these, 23 (48%) patients had some chordal rupture. Mitral valve repair was performed in 50 patients and one patient required valve replacement due to repair failure. The mean follow-up was 58.45 ± 36.18 months, and there were no deaths in this series of patients. One patient was reoperated 90 months after the first surgery for a new repair. We have not presented mortality so far. One patient required permanent pacemaker implantation. The left atrial diameter decreased from 47.2 ± 5.08 mm to 43.46 ± 6.6 mm ($P < 0.001$). The left ventricular end-systolic and end-diastolic diameters decreased from 40.0 ± 6.8 mm and 64.8 ± 7.0 mm to 34.6 ± 6.7 mm ($P < 0.001$) and 52.7 ± 7.4 mm ($P < 0.001$).

Conclusion: Mitral repair for severe mitral regurgitation in patients with mild or no symptoms was performed with low mortality and morbidity, good valve function and preserved left ventricular performance. Early repair may be advocated based on the severity of regurgitation and on the possibility of the valve repair, regardless of symptoms.



• FT 129

Surgical Management of the Tricuspid Valve in Carcinoid Heart Disease: A Case Report

Javier Dario Garzon Rodriguez, Felipe Noriega Acosta, Karen Andrade, Natalia Mesa, Aida Julieth Andrade

Introduction: Neuroendocrine tumors (NETs) are heterogeneous malignancies frequently originating from the gastrointestinal tract. NETs constitute only 0.5% of all malignant conditions and 2% of all malignant tumors of the gastrointestinal tract. Functioning NET can lead to carcinoid syndrome (CS) by secreting vasoactive substances being serotonin the most prominent. The presence of liver metastases can alter the metabolization and inactivation of vasoactive substances resulting in right heart involvement. Carcinoid heart disease (CHD), defined as CS associated with cardiac involvement, is a relatively common fibrotic complication of NETs and a major cause of morbidity and mortality, leading to progressive dysfunction of the affected cardiac valves and ultimately to congestive heart failure. The pathophysiology of CHD has not been accurately defined; cardiac lesions are believed to be due to local action of serotonin inducing proliferation of fibroblasts and smooth muscle cells, production of inflammatory cytokines developing plaque-like material on endocardial surfaces including valve leaflets, subvalvular apparatus, and cardiac chambers. The plaque is composed of fibroblasts, smooth muscle cells, lymphocytes, mast cells, extracellular matrix and overlying endothelial layer. Plaque formation causes annular constriction, thickening of the valve leaflets, and fusion of the subvalvular apparatus, leading to non-coaptation of the valve leaflets and valvular regurgitation. Cardiac involvement is associated with a poor long-term prognosis. Echocardiography plays a key role in the screening and diagnosis of CHD. The management of CHD requires medical and surgical treatment by a multidisciplinary team for improved survival.

Case Report: A 56-year-old male with a history of hypothyroidism and primary colonic well-differentiated NET with hepatic metastases managed with monthly injections of lanreotide and everolimus presented with a 6-month history of peripheral edema, worsening of functional class, and dyspnea. Transthoracic echocardiogram revealed a non-dilated right ventricle and thickening of the tricuspid valve with absence of leaflets coaptation and mobility restriction, generating mild stenosis and massive central regurgitation. Due to severity of valvular involvement, symptoms of right heart failure and the low surgical risk, a tricuspid valve replacement was performed. During the surgical procedure, the tricuspid valve was found sclerotic with commissural fusion and thickened chordae tendineae. The tricuspid valve was replaced with a 31 mm bioprosthesis. The patient was started on octreotide infusion one hour before the surgery, during the surgical procedure and one hour after the surgery, as a prevention for carcinoid crisis. The postoperative transthoracic echocardiogram demonstrated a well-seated bioprosthesis with functional leaflets and trivial regurgitation. The patient was discharged home nine days after surgery.

Conclusion: CHD is a fibrotic complication seen in patients with CS especially affecting the right heart valves. and tricuspid regurgitation is the most common valvulopathy. It remains a major cause of morbidity and mortality, associated with poor prognosis when heart failure is present. A multidisciplinary approach involving collaboration between cardiologist, oncologist, and cardiac surgeon is fundamental. The mainstay of treatment for carcinoid heart disease is surgery, as it improves patient's symptoms and survival.



• FT 130

Transapical Approach to Aortic and Mitral Interventions: Experience at a University Hospital

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Introduction: Heart valve disease is a significant health problem affecting millions of people worldwide. The aortic and mitral valves are the most frequently affected, and conventional therapy consists of replacement or surgical repair of these valves. However, conventional valve surgery can be associated with significant risks and may not be a viable option for some high-risk patients.

Methods: The database of the Heart Institute of the Hospital das Clínicas of the Medical School of the University of São Paulo (InCor- HCFMUSP) was assessed for data related to all transapical procedures performed in 2022 and in the first quarter of 2023. Clinical outcomes such as mortality and days of hospitalization were evaluated.

Results: Twenty-two patients were operated on during 2022 and the first three months of 2023, 10 (45%) female and 12 (55%) male. The mean age of the patients was 73.24 years, ranging from 57 to 85 years. Among the transapical procedures, 8 (36%) underwent transcatheter aortic valve implantation (TAVI), 8 (36%) underwent aortic valve-in-valve procedure, and 6 (28%) underwent mitral valve-in-valve procedure. The operative mortality was 13%, (3 patients). These deaths occurred in the postoperative intensive care unit (ICU), all after 30 postoperative days. The mean EuroSCORE II of the patients who died was 9.14%, thus classified as high surgical risk patients. The mean EuroSCORE II of all patients who underwent transapical procedures was 6.27%, ranging from 1.39% to 24.9%. The average postoperative stay of the patients was 12.9 days, with an average of 6.4 days in the ICU.

Discussion: In 2019, Mirdamadi published a systematic review that evaluated 44 studies that included a total of 4,292 patients undergoing transapical procedures for treatment of valve disease. The overall in-hospital mortality was 4.4%, while late mortality was 6.8%, with a mean follow-up of 19.6 months. In 2020, Attaran et al. evaluated the outcomes of 51 patients undergoing transapical procedures for treatment of mitral valve disease and found an in-hospital mortality of 3.9%, and a complication rate of 13.7%.

Conclusion: In general, the transapical approach can be a safe and effective option for patients with heart valve disease who do not meet the criteria for conventional surgery.



• FT 131

Transcatheter Valve Replacement Experience at a Center in Southern Brazil

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Objective: The severe aortic stenosis is a harmful condition that leads to a mortality up to 50% in two years. Therefore, the main therapy proposed is its replacement, improving the symptoms and enhancing the quality of life. However, the surgical approach could have a high mortality risk specially in the older or in patients with a great variety of comorbidities. Thus, the transcatheter aortic valve implantation (TAVI) is a less invasive procedure that has shown as an alternative for those patients. The PARTNER trial demonstrated a significant reduction in mortality and improvement in functional class in inoperable patients compared with standard medical care. Moreover, in the PARTNER 3 trial, the estimated incidence of the primary endpoint (composite of death, stroke, or rehospitalization at one year) was significantly lower in the TAVI group than in the surgical one, without significant difference between mortality rates. Therefore, this study aims to analyze the data of patients submitted to transcatheter valve replacement to identify the profile of our patients and compare it with the scientific literature.

Methods: A descriptive, observational and retrospective study was performed with the goal of surveying data of patients with dysfunction of theirs native or prosthetic valves from November 2014 through April 2023 who were submitted to transcatheter valve replacement at a center in Southern Brazil. All the information was collected from the medical report and analyzed through the Microsoft Excel® software.

Results: From November 2014 to April 2023, a total of 50 patients underwent transcatheter valve replacement, including 41 (82%) with native aortic stenosis, 5 (10%) aortic valve-in-valve and 4 (8%) mitral valve-in-valve due to prosthetic valve dysfunction. The average age was 80.1 years, and 27 (54%) of them were male. About comorbidities, 36 (72%) of the patients had arterial hypertension, while 16 (32%) and 18 (36%) had diabetes and dyslipidemia, respectively. Additionally, 17 (34%) of the group had coronary artery disease and 7 (14%) of them had chronic kidney failure. It was seen that 8 (16%) had already been submitted to coronary artery bypass graft, whereas 5 (10%) and 6 (12%) had undergone surgical aortic and mitral valve replacement, respectively. In general, the average hospital admission length were 8 days, with 3.6 days spent in the intensive care unit. Only 1 patient died post-TAVI because of cardiac failure and septic shock, accounting for an overall mortality of 2%. About the prothesis, 30 (60%) cases have used Edwards-Sapien® valve, followed by 15 (30%) of Medtronic® and 5 (10%) with Boston® valves. Only 1 patient had a stroke after the procedure (2%), while using a Medtronic® valve, and 5 (10%) had atrioventricular block, followed by the need for permanent pacemaker implantation (2 cases with Medtronic® valve and 3 with Edwards® valve).

Conclusion: TAVI has been increasing largely in the last years, becoming the first option of treatment in some centers because of its less invasive technique, with fewer complications, especially in high-risk patients. We conclude that even a small center in the south of Brazil can achieve similar results to larger institutions, with comparable rates of mortality, stroke and need for pacemaker implantation. Even with a small population, this data helps us to understand what we can improve to provide better assistance to our patients.



• FT 132

Treatment of Complications Involving Valve Prostheses and Heart Grafts: How Has the Covid Pandemic Affected the Epidemiological Profile of Recent Years?

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Objective: To analyze the number of hospitalizations, mortality rate, mean hospitalization value, and the regions most associated with treatment of complications involving valve prostheses and heart grafts, for an 8-year interval (2015-2022).

Methods: Statistical, descriptive and cross-sectional analysis of the Department of Informatics of the Brazilian Unified Health System (DATASUS) data, according to the Hospital Information System (SIH/SUS) from January 2015 to December 2022.

Results: During the analyzed period, 1,411 hospitalizations were recorded for the treatment of complications involving valve prostheses and heart grafts, especially in the years 2019 to 2022, corresponding to approximately 71.36% of the observed prevalence. The year 2022 had the highest number of hospitalizations, corresponding to 353 hospitalizations, about 25.01% of the total. The observed mortality rate was 4.96, with a total of 70 recorded deaths. The average daily cost of hospitalizations was R\$1,376.75. As for the Brazilian regions, the one with the highest number of cases collected was the southeast region, corresponding to about 567 cases, with a relative frequency of 40.18%.

Conclusion: From the data collected, it can be seen that the number of complications involving valve prostheses and heart grafts has been growing in recent years, especially in the years marked by the COVID-19 pandemic, highlighting a possible direct relationship between the unsatisfactory cardiovascular outcome involving severe infection by SARS-CoV-2 and the hemodynamic status of patients grafted and with prosthetic devices. Although higher expenses were detected in the average value of hospitalizations for treatment, it is noteworthy that the mortality rate decreased considerably, falling more than 50% from 2016 to 2022, which is an indication that such procedures deserve to be further explored in Brazil, and that a better outcome in reducing morbidity and mortality is directly related to the previous hemodynamic status of the individual, and possibly in the investment in various fields of treatment of these conditions.



• FT 133

Left Atrial Strain Predicts Rhythm Outcome in Patients with Persistent Atrial Fibrillation Undergoing Left Atrial Cryoablation During Minimally Invasive Mitral Valve Repair

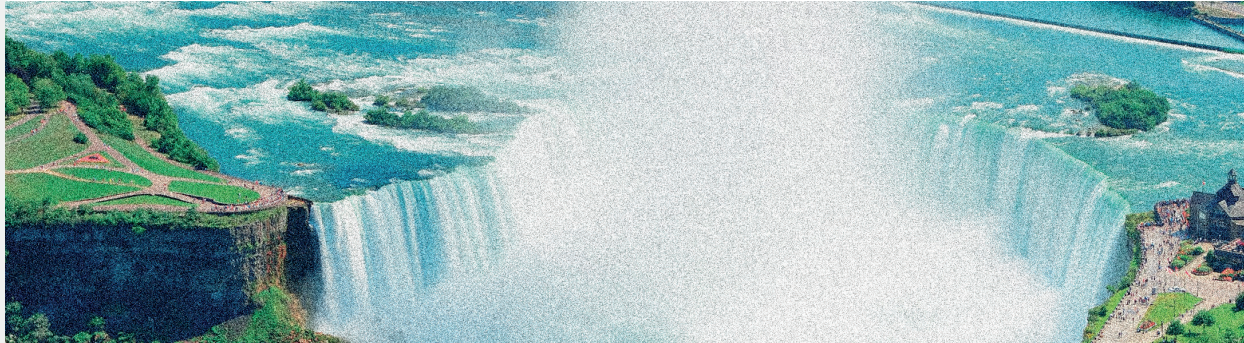
Simon Pecha, Yalin Yildirim, Sevenai Yildirim, Johannes Petersen, Yousuf Alassar, Christoph Sinning, Stefan Blankenberg, Hermann Reichenspurner

Objective: Left atrial (LA) strain is a predictor for LA function and is reduced in patients with atrial fibrillation. We here evaluated the prognostic value of LA strain to predict rhythm outcome in patients with persistent AF undergoing LA cryoablation concomitant to minimally invasive mitral valve repair.

Methods: Between January 2016 and May 2019, 51 patients with persistent atrial fibrillation underwent LA cryoablation during minimally invasive mitral valve surgery. All patients received a complete LA lesion set and left atrial appendage (LAA) closure with Atriclip and 14 (27.5%) patients received additional tricuspid valve repair. All patients received a preoperative TTE with LA and left ventricular (LV) strain measurement. Preoperative LA and LV strain analysis was correlated with postoperative rhythm outcome.

Results: The mean patient age was 66.6 ± 9.5 years, and 53% of them were male. No major ablation-related complications occurred in any of the patients. Successful closure of the LAA was confirmed by intraoperative echocardiography in all patients. One-year survival rate was 96%. Freedom from atrial fibrillation (AF) at 12 months was 71%. Permanent pacemaker implantation rate was 7.8%. Preoperative LA strain values were statistically significant higher ($12.4\% \pm 7.3\%$ vs. $4.8\% \pm 3.3\%$, $P=0.008$) in patients with freedom from AF at 12-month follow-up. Preoperative LV strain value was not correlated with postoperative rhythm outcome.

Conclusion: LA strain analysis is a valuable tool to predict rhythm outcome in patients with persistent AF undergoing concomitant surgical AF ablation. In the future, LA strain might be a useful tool to guide decision-making on ablation strategies in patients with persistent AF.



• FT 134

Long-Term Outcome after Mechanical vs. Biological Aortic Valve Replacement in Non-Elderly Adults

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Objective: Aortic valve replacement (AVR) is the standard of care for treatment of aortic valve stenosis (AS). In non-elderly adults, mechanical valve prostheses are recommended due to the limited durability of biological valve prostheses. The aim of the study was to evaluate the long-term outcome and quality of life after AVR in patients younger than 60 years and to compare mechanical (mech-AVR) and biological prosthesis (bio-AVR).

Methods: A total 721 consecutive patients younger than 60 years who received AVR at our institution between January 2005 and December 2018 were included. Follow-up protocol included clinical interview using a structured questionnaire (e.g. SF-12 and echocardiographic follow-up). The primary endpoint was major adverse cardiac and cerebrovascular events (MACCE) and secondary endpoints were survival, aortic valve reintervention, and quality of life.

Results: A biological prosthesis was implanted in 560 (78%) patients, whereas a mechanical was used in 161 (22%) patients. The mean age at the time of index AVR surgery was significantly higher in the bio-AVR group compared to mech-AVR ($P < 0.001$). Landmark analysis by using an adjusted Cox model until 5 years showed that the following variables had significant impact on MACCE events: COPD (HR 2.17; 95% CI 1.23-3.85; $P = 0.008$), dialysis (HR 4.21; 95% CI 1.97-9.00; $P < 0.001$), EuroSCORE II (HR 1.10; 95% CI 1.05-1.15; $P < 0.001$), and endocarditis (HR 2.61; 95% CI 1.55-4.38; $P < 0.001$). After 5 years, endocarditis still had a significant impact on MACCE rate ($P = 0.027$). Further, landmark analysis revealed no differences in MACCE rate between mech-AVR vs. bio-AVR until 5 postoperative years ($P = 0.973$). Beginning with 5 postoperative years, bio-AVR had a significantly higher MACCE rate vs. mech-AVR (HR 0.09; 95% CI 0.02-0.50; $P = 0.006$). Survival was comparable in both study subgroups and was influenced by concomitant coronary artery disease (HR 2.53; $P < 0.001$), dialysis (HR 5.02; $P < 0.001$), EuroSCORE II (HR 1.09; $P < 0.001$), and endocarditis (HR 3.09; $P < 0.001$). At the follow-up, physical quality of life (QoL) was similar in both groups ($P = 0.195$), but mental QoL was worse after bio-AVR vs. mech-AVR ($P < 0.001$).

Conclusion: Tissue AVR in non-elderly adults is associated with significantly higher MACCE rate after 5 postoperative years and results in worse mental QoL during long-term follow-up. The choice of aortic valve prosthesis does not impact the long-term survival. However, MACCE rate remains high at 10 years post-AVR in non-elderly adults, especially in the bio-AVR group.

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