SUPPLEMENT

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VASCULAR SURGERY

RAPID DEPLOYMENT AND TAVI FOR ISOLATED AORTIC VALVE STENOSIS. REAL WORLD DATA COMPARISON USING PROPENSITY SCORE MATCHING

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Keywords: *Ultrasonography, Doppler, Color; Ultrasonography; Femoral Vein; Thrombosis.*

INTRODUCTION

The standard of care for patients with aortic valve stenosis has changed significantly over the last decades. Transcatheter aortic valve implantation (TAVI) and rapid deployment (RDAVR) surgical devices represent the most recent treatment options, although few evidence has been published comparing both.

OBJECTIVES

Our study compare perioperative and long-term results of transcatheter versus rapid deployment devices in a tertiary center using a propensity score matching analysis.

MATERIALS AND METHODS

Single-centre observational retrospective study including all patients submitted to RDAVR or TAVI for aortic valve stenosis, from 2014 to 2019. Reoperations were excluded. Patients were qualified for TAVI or RDAVR by our heart team. Pre and perioperative data were retrieved from the clinical files from the department. Operatory data in-hospital stay and postoperative complications were also collected. Vascular complications were defined by the Valve Academic Research Consortium (VARC)-2 Scale. A propensity score matching of 158 patients was used to adjust both populations.

RESULTS

541 patients were included (224 with RDAVR and 347 with TAVI).

In the entire cohort, patients submitted to TAVI were older, had a higher EuroscoreII and an increased incidence of diabetes mellitus, peripheral arterial disease, excessive weight, thrombocytopenia and reduced left ventricular ejection fraction.

All TAVI were performed under general anaesthesia using a transfemoral approach. RDAVR were either Intuity or Perceval S bioprosthesis.

TAVI was associated with a 16,5% rate of vascular complications and a higher rate of leaks grade 2 or 3 (4,5% vs. 0%,p=0,009). The incidence of permanent pacemaker implantation was similar between the two groups (17% vs 13,2%,p= 0,420).

Overall neurological disturbances were observed more frequently in the RDAVR group (14,6% vs. 4,4%, p=0,003);however, stroke was more frequent in the TAVI group, despite not reaching statistical significance (0,6% vs. 2,5%,p=0,06).

The mean length of stay (LOS) was shorter in the RDAVR group (6,8 vs. 9,5 days,p<0,001).

Mortality at 30-days was higher in the TAVI patients (0,6% vs 3,8%,p=0,121), and the trend remained during the 5 years follow-up period, even when considering only the cardiovascular related events (p<0,001).

CONCLUSION

Considering our post-operative and long-term results, in our population, RDAVR seem to offer a safe and better approach than TAVI. Although complication rates are comparatively similar, the incidence of stroke and paravalvular leaks is higher in the TAVI group. Moreover, the overall LOS is longer when compared to RDAVR, probably due to the higher rate of vascular complications. Long term overall survival and cardiovascular-associated mortality also favours RDAVR.

SOFA SCORE IN THE INTENSIVE CARE UNIT AS A PREDICTOR OF LONG-TERM SURVIVAL AFTER AORTIC VALVE REPLACEMENT

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Keywords: *aortic valve replacement, intensive care unit, SOFA score, long-term outcome*

INTRODUCTION

The Sequential Organ Failure Assessment (SOFA) score is a predictor of mortality in intensive care unit (ICU) patients. Although it is widely used and has been validated as a reliable and independent predictor of mortality and morbidity in cardiac ICU, few studies correlate early post-operative SOFA with long-term survival.

MATERIALS AND METHODS

Retrospective study of 355 patients submitted to aortic valve replacement (2016-2018). SOFA score was calculated daily for each patient during ICU stay. Initial SOFA score,SOFA score at 48h, mean and highest-SOFA scores were correlated with survival at 12 and 24 months. Due to variables being non-normal, Wilcoxon tests were used to analyze differences in variables between survivors and non-survivors. Univariate logistic regressions, with McFadden's Pseudo-R2, likelihood ratio test and validation with an additional dataset were used to access the predictive modeling. Receiver operating characteristic (ROC) curves were used to assess accuracy of the variables in separating survivor from non survivors.

RESULTS

Patients with lower SOFA scores have better survival rates at 12 and 24 months. When analyzing the outcome at 12 months, patients with mean SOFA 0-1 had mortality rates of 2.5%; SOFA 2-3 3.4%; SOFA 4-5 1.8%; SOFA 6-7 12%; SOFA 8-9 27.3%; SOFA 10-11 50% and SOFA >11 66.7%. Trends in correlation of mean-SOFA with survival at 24-months were similar. SOFA at 48h was also correlated with survival at 12-months, with mortality rates of 1.9% for 0-1; 2-3 3.4%; 4-5 0%; 6-7 15.6%; 8-9 22.2%; 10-11 50% and >11 100%. SOFA at 48h had a similar correlation with survival at 24 months. In univariate regression analysis, mean-SOFA and SOFA at 48h showed better potential to model outcome than initial SOFA and highest-SOFA, although their predictive power is reduced, with sensivity ranging from 61.5-71.4%. Absolute values of these variables showed a better accuracy in distinguish survivors from non-sorvivors at 12 [Mean-SOFA area under the curve (AUC) 0,785 and SOFA 48h AUC 0,769; initial SOFA AUC 0,716 and highest-SOFA AUC 0.724] and 24-months (Mean-SOFA AUC 0,744 and SOFA 48h AUC 0,722; initial SOFA AUC 0,696 and highest-SOFA AUC 0.720) than initial SOFA and highest-SOFA. Patients with a decreasing score during the first 48h had mortality rates of 5.4%, while an unchanged or increased score was associated with a mortality rate of 6.6%.

CONCLUSION

Mean-SOFA and SOFA at 48h correlate with survival at 12 and 24 months. Patients with lower SOFA scores have higher survival rates. Differences in survival at 12 months were better correlated with the SOFA scores at 48h than with its variation during the first 48h. SOFA score can be useful to access long-term outcomes to stratify patients with higher probability of mortality.

TAVI BY NON-FEMORAL ACCESS ROUTES: A SINGLE-CENTRE EXPERIENCE

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Keywords: *aortic stenosis, endovascular, non-femoral access*

INTRODUCTION

Transcatheter aortic valve implantation (TAVI) is considered as an alternative to surgical valve replacement in older or high-risk patients or those that are unsuitable for surgery. European and American guidelines only recommend the femoral access for the implantation of these percutaneous devices. However, some patients are unsuited for this access due to small arterial diameter or atheromatous disease.

OBJECTIVES

This study aims to evaluate the results of a program of non-femoral access TAVI and to demonstrate its safety and reproducibility.

MATERIALS AND METHODS

We selected patients that were submitted to non-femoral access TAVI from Centre Hospitalier et Universitaire de Rennes from the 1st January 2015 to the 31st December 2020. Each patient was discussed in the Heart Team to decide the eligibility for TAVI and was deemed unoperable due to heavy comorbidities. The choice of alternative access was also made in case femoral access was not feasible.

RESULTS

From January 2015 to December 2020, 285 patients were submitted to non-femoral access TAVI, of those 62.5% were male and mean age at implantation was 79.3 ± 6.9 years.

Regarding access, the majority was left carotid artery (55.1%), followed by left subclavian (24.9%) and apical access (10.9%). Other accesses included aortic, right carotid and right subclavian arteries (6.0%, 2.5% and 0.7%, respectively). Balloon expandable valves were used in 71.8% and self-expandable valves in 28.2%. The rate of conversion to sternotomy was 1.8% and TAVI migration occurred in 1.1% of patients.

Post operative complications included disabling stroke (0.7%), pacemaker implantation (17.4%), atrial fibrillation (21.5%), acute kidney injury (14.0%) and reprise for haemorrhage (3.6%). Postoperative echocardiographic control revealed TAVI average gradient of 12.3 ± 6.3 mmHg, and aortic insufficiency greater than moderate in only 2.5% of patients.

We registered only 1 procedural death and survival at 30 days was 97.9%.

CONCLUSION

Non-femoral access TAVI is a very safe alternative for those patients that are not candidates for femoral access TAVI, especially trans-vascular access.

TOTALLY ENDOSCOPIC AORTIC VALVE REPLACEMENT - HOW WE DO IT

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INTRODUCTION

Minimally invasive cardiac surgery is on the march and is becoming state of the art for a series of cardiac procedures. Cardiac surgeons are looking for new techniques, with less traumatic approaches and better functional and cosmetic results. Nonetheless, totally endoscopic aortic valve replacement is still performed in limited centers, with few series reports. We present our safe and feasible totally endoscopic surgical technique used for aortic valve replacement with a sutereless prosthesis.

CARDIOFOLLOW.AI - THE VALUE OF A DIGITAL CARDIOTHORACIC FOLLOW-UP SERVICE

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Keywords: *telemonitoring, value in health, outcomes, cost analysis*

INTRODUCTION

Recent studies seem to evidence that telemonitoring can be important in secondary prevention by improving outcomes of cardiological therapeutics. However, there are no studies demonstrating its benefits in patients submitted to cardiac surgery.

OBJECTIVES

This study aims to assess the impact of adding a home telemonitoring-based intervention to the standard follow-up of patients submitted to cardiac surgery on the number of unplanned post-operative appointments and hospitalizations and associated costs.

MATERIALS AND METHODS

From November 2019 to April 2021, 35 patients, who underwent cardiac were selected to be telemonitored for 30 days. Exclusion criterion was incapacity to manage the kit. Male patients represented 57.14% of the participants and the average age was 60.3 ± 13.59 years. Each patient was given an IoT kit consisting of a smartphone with the SMARTBEAT app for daily collection of data from a smartwatch, a sphygmomanometer, and a weight scale. A control group was created from previously operated patients with 3:1 matching on age, sex, and procedure. The independent samples t-test was used to compare the number of events between the patient groups. Patients were required to answer a satisfaction questionnaire: Net Promoter Score (NPS). Intervention costs were calculated using a Time-Driven Activity-Based Costing. Costs with unplanned outpatient appointments and readmissions were computed using a top-down perspective: the amount defined in the Long-term Program Contract.

RESULTS

Telemonitored patients had higher rate of unplanned consultations (telemonitored (T): 0.088; non-telemonitored (NT): 0.039; t-test: t=0.93; p=0.36) and lower rate of readmissions (T: 0.029; NT: 0.069; t-test: t=-0.77; p=0.45). Both results are not statistically significant. Telemonitoring lead to 6,91 ± 4,30 actions/patient, that included: therapeutic changes (14,05%), unplanned consultations (1,65%) and hospital readmission (1,24%).

Concerning telemonitored patients' satisfaction, the average NPS score was 87: 27 were promoters, 1 was a detractor and 2 were passives.

Telemonitoring follow-up incurred additional costs when compared with standard care (€281.00 versus €110.75). This is mostly explained by the additional time dedicated to the patient by the healthcare professionals: 4:30 hours/patient. Focusing on the impact of the telemonitoring follow-up on hospital readmissions for the average patient, the intervention led to saving €1696.21. However, we registered a €63.24 increase in the cost of the appointments for the average patient.

CONCLUSION

Telemonitoring follow-up in cardiac surgery is feasible and is associated high levels of patients' satisfaction and low costs. As telemonitored patients receive more individualized care, the number of appointments increases, which may indicate that they received more patient-centered care that improves outcomes.

MINIMALLY INVASIVE CONCOMITANT AORTIC AND MITRAL VALVE REPLACEMENT/REPAIR - INITIAL EXPERIENCE OF A SINGLE CENTRE

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INTRODUCTION

Valve surgery through a median sternotomy has been the standard approach, but in the past decade various minimally invasive procedures have gained increasing acceptance. The majority of data available about minimally invasive cardiac surgery is on single valve surgery with very limited experience existing for the treatment of double-valve disease. For patients undergoing combined aortic and mitral valve surgery, a minimally invasive approach, performed via a right lateral minithoracotomy, is feasible. This technique is safe and effective, and leads to an enhanced recovery due to reduction in surgical trauma. We report our initial experience, describing surgical technique and post-operative results.

LIFE EXPECTANCY OF PATIENTS ON PRE-OPERATIVE RENAL REPLACEMENT THERAPY AFTER CORONARY ARTERY BYPASS GRAFTING COMPARED WITH GENERAL AND HAEMODIALYSIS POPULATION

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Keywords: *Cirurgia de revascularização do miocárdio, Terapia de Substituição Renal, Sobrevivência expectável*

INTRODUCTION

Despite the high risk for severe coronary artery disease, it remains controversial if patients on renal replacement therapy (RRT) can safely and effectively undergo coronary artery bypass grafting surgery (CABG).

OBJECTIVES

To clinically characterize patients on pre-operative RRT who underwent CABG and their post-operative outcomes. Also, to compare this samples' observed survival with the expected for the overall population and for an RRT subsample.

MATERIALS AND METHODS

Retrospective single-centre study including patients on pre-operative RRT who required isolated CABG in 2004-2013. Maximum follow-up: 15 years, median: 9 years. Using data reported by the National Statistics Institute, Kaplan-Meier curves and one-sample Log-rank test were used to calculate standardised mortality ratios (SMR) and compare our results with the expected survival in the overall population. To compare our results with the expected survival in an RRT subsample, GetData Graph Digitizer was used.

RESULTS

We included 35 patients, mean age 62±11 years, 86% male. Most patients presented diabetes (63%), arterial hypertension (97%) and dyslipidaemia (60%). Mean EuroSCORE II was 5.1±6.5% (1.1–38.8% - min-max). Twenty-one (68%) patients were on CCS class IV, 15 (43%) had a recent acute myocardial infarction, 25 (71%) presented 3-vessel disease, 54% were on-pump CABG and 19 (54%) urgent surgery. Post-operatively, 2 patients (6%) presented low cardiac output, 4 (13%) mechanical ventilation >24h and 15 (43%) de novo atrial fibrillation. The mean hospital stay was 14±11 days. Four patients required re-exploration: 2 due to bleeding and 2 due to sternal dehiscence. Regarding all-causes mortality, 2 patients (6%) died in the hospital or within the first 30 days after surgery and 25 patients during the assessed follow-up. The observed survival was 89%, 69%, 51% and 27%, at 1-, 3-, 5- and 10-years respectively, being significantly lower than the expected in the general population (99%, 96%, 94% and 86%, (SMR (95%CI): 10.6 (6.8-16.5), $p<0.001$)). Comparing with the survival expected in HD patients (84%, 68% and 55% at 1, 3 and 5-years), the observed survival rates were 89%, 69% and 51% and the HR (95%CI) 1.11 (0.72-1.70), $p=0.649$.

CONCLUSION

Our results show a significantly decreased long-term survival of a sample of RRT patients undergoing CABG, compared with the general population. However, compared with a subsample under haemodialysis the survival rates were similar. Hence, it seems that a major cardiac intervention in RRT patients does not present an additional mortality risk. Further studies should be conducted to validate these results.

IMPACT OF ORAL ANTICOAGULATION THERAPY ON POSTOPERATIVE ATRIAL FIBRILLATION OUTCOMES: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Keywords: *atrial fibrillation, cardiac surgery, anticoagulation, long-term outcome*

INTRODUCTION

Post-operative atrial fibrillation (POAF) is the most common complication after cardiac surgery. Recent studies had shown this phenomenon is no longer considered transitory and is associated with higher risk of thromboembolic events or death.

OBJECTIVES

The aim of this study was to systematically review and analyze previous studies comparing oral anticoagulation therapy with no anticoagulation, regarding these long-term outcomes.

MATERIALS AND METHODS

PubMed/MEDLINE, EMBASE, Web of Science and Chrochrane Database were systematically searched to identify the studies comparing the risk of stroke, or thromboembolic events or mortality of POAF patients who received anticoagulation compared with those who were not anticoagulated. Incidence of stroke, thromboembolic events and all-cause mortality were evaluated up to 10 years after surgery. Time-to-event outcomes were collected through hazard ratio (HR) along with their variance and the early endpoints using frequencies or odds ratio (OR). Random effect models were used to compute statistical combined measures and 95% confidence intervals (CI). Heterogeneity was evaluated through Q statistic-related measures of variance (Tau2, I2, Chi-squared test).

RESULTS

Eight observational cohort studies were selected, including 15335 patients (3492 on Oral Anticoagulants (OAC) vs 11429 without OAC), met the inclusion criteria for qualitative synthesis. Patients had a wide gender distribution (38.6%-82.3%), with all being older than 65 years (67.5-85). Vitamin K antagonists were the most commonly prescribed anticoagulants (74.3%-100%). OAC was associated with a protective effect on all-cause mortality at a mean of 5.0 years of follow-up (HR is 0.85 [0.72 – 1.01]; p=0.07; I2=48%). Stroke, thromboembolic and major bleeding events did not differ between the two treatment arms (HR 1.04 [0.81-1.33], p=0.75); HR 0.68 [0.40-1.15], p=0.15); and HR 1.10 [0.70-1.72], p=0.68, respectively).

CONCLUSION

Current literature suggests a possibly protective effect of OAC therapy for all-cause mortality in patients with new-onset atrial fibrillation after cardiac surgery. However, it does not appear to impact stroke, thromboembolism and major bleeding.

SUTURELESS BIOPROSTHESES AND PATIENT-PROSTHESIS MISMATCH – A REAL LIFE STUDY

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Keywords: *sutureless, patient-prosthesis mismatch, aortic valve replacement*

INTRODUCTION

Sutureless aortic valve bioprostheses have been developed to overcome the increased surgical risk of a growing number of patients. The Perceval (PCV) bioprosthesis (LivaNova, Saluggia, Italy) is a sutureless bovine pericardium valve that has been proposed to achieve better hemodynamics than the conventional valves and reduce the incidence of patient-prosthesis mismatch (PPM). However, only few studies have evaluated the hemodynamic performance using PCV.

OBJECTIVES

Analyze the incidence of PPM after the implantation of Perceval or stented Perimount Magna (PM) bioprosthesis (Edwards Lifesciences, Irvine, CA, USA) and its implication on long-term mortality.

MATERIALS AND METHODS

Single centre retrospective study of all patients who underwent AVR using PCV or PM between 2014 and 2020. Initial population: 670 patients. Exclusion criteria: other cardiac procedures (n=94), reoperations (n=3), emergency procedures (n=4), active endocarditis (n=6), valve size ≥25/L (n=105) or no/incomplete echocardiogram data (n=99). Final population: 359 patients. Mean follow-up: 3,1 years.

Echocardiography evaluation was performed at rest before hospital discharge. Effective orifice area (EOA) was calculated according to the continuity equation. Effective orifice area index (iEOA) was determined by dividing EOA by body surface area. Moderate PPM was defined as iEOA 0.66-0,85cm2/m2. Severe PPM was defined as the iEOA ≤0.65cm2/m2.

Inverse probability of treatment weighting (IPTW) using propensity score was performed to evaluate to analyze the effect of the type of bioprosthesis on PPM. Cox proportional analysis was used to evaluate the effect of PPM on long-term mortality.

RESULTS

Of the 359 patients, PCV was implanted in 59 and PM in 300 patients. The PCV group was older (81± 4.1 vs. 74± 5,9,p<0.001), had more females (p=0,002), with a smaller BSA (1.7±0.2 vs. 1.8±0,2,p<0.001) and more peripheral arterial disease (p=0,02).

In PCV group, the mean iEOA was 1.08cm2/m2 and in PM group was 1,02cm2/m2. Moderate PPM was present in 16.9% of PCV group and in 23.3% of PM group. Severe PPM occurred in 11,9% of PCV group and in 4,3% of PM. After IPTW adjustment, the implantation of PCV was associated with a higher incidence of severe PPM (OR 3.03;CI95%:1.148-7.984; p=0.025). No differences related to moderate PPM were found.

On multivariable analysis, severe PPM was associated with increased long-term mortality (HR 2.57;CI95%:1.050-6.279;p=0.039), along with diabetes and male gender.

CONCLUSION

Despite the possible benefits of a sutureless bioprosthesis on high-risk patients, this study raises concern for the incidence of PPM and its relevance on long-term mortality.

OFF-PUMP VERSUS ON-PUMP CORONARY ARTERY BYPASS GRAFTING: A PROPENSITY SCORE-MATCHED ANALYSIS

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Keywords: *coronary artery bypass grafting, coronary surgery*

INTRODUCTION

The role and the indications for using off-pump coronary artery bypass surgery (OPCAB), instead of the traditional on-pump (ONCAB), are still to be addressed.

OBJECTIVES

To compare 15-years survival and early safety outcomes between OPCAB and ONCAB.

MATERIALS AND METHODS

Single-centre retrospective cohort including 9-years of isolated first CABG (2005-2013). Multi-vessel disease with at least 2 surgical grafts patients were considered and the first 50 surgeries of each surgeon with each technique were excluded to account for the learning curve effect. Emergent surgeries and on-pump beating heart procedures were also excluded. A propensity-score matching (PSM) analysis was performed to balance groups and both survival and early outcomes comparison was done within the matched cohort using Kaplan-Meier or Cox stratified and paired tests, respectively. The median follow-up was 9 years, maximum 15 years.

RESULTS

From 3012 multi-vessel patients with at least 2 surgical grafts, 2503 were included at the main analysis: 1487 ONCAB and 1016 OPCAB. ONCAB patients presented more frequently 3-vessels disease and left ventricular dysfunction, but received similar number of grafts than OPCAB, who in turn, received more frequently multiple arterial grafts. The surgical completeness of revascularization (CR) was similar, but hybrid procedures were more frequent in OPCAB raising CR rate in this group. After PSM (646 pairs), both groups were similar regarding pre and peri-operative characteristics. The long-term survival was similar (HR stratified by pair: 1.02 (0.81-1.30), but OPCAB evidenced benefits at early term results including bleeding, postoperative atrial fibrillation and stroke incidence.

CONCLUSION

At our centre, OPCAB performed by experienced surgeons provides rates of complete revascularization and long-term survival similar to ONCAB. In-hospital results favoured OPCAB.

A META-ANALYSIS OF RANDOMIZED CONTROLLED STUDIES COMPARING OFF-PUMP VS ON-PUMP CABG IN THE ELDERLY

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Keywords: *coronary artery bypass grafting, elderly, off-pump*

INTRODUCTION

The increasing demand for coronary revascularization in the elderly has raised the interest in off-pump coronary artery bypass graft (CABG) as an option in these high-risk patients.

OBJECTIVES

We sought to investigate the differences between off-pump CABG (OPCAB) and on-pump CABG (ONCAB), among patients older than 60, in short and mid-term results throughout a meta-analysis of randomized clinical trials (RCTs).

MATERIALS AND METHODS

A literature search was conducted using MEDLINE, ISI Web of Science and Cochrane Library (1960-2020). RCTs reporting mortality outcomes of OPCAB vs ONCAB within elderly patients (as prespecified or secondary analysis) were included. Data on myocardial infarction, stroke, repeat revascularization, renal failure and composite endpoints after CABG were also collected. Hazard ratio (HR) and variance for follow-up outcomes and frequencies or odds ratio (OR) for early endpoints were collected. Random effect models were used to compute statistical combined measures and 95% confidence intervals (CI).

RESULTS

Seven RCTs encompassing a total of 6,609 patients were included (3,303 OPCAB and 3,306 ONCAB, 50% were men). Five trials reported mortality during follow-up (6 months (2 studies) to 5 years). There were no significant differences on mid-term mortality (pooled HR:1.02, 95% CI: 0.88-1.17, p=0.82) and composite endpoint incidence (4 studies pooled HR:0.98, 95% CI: 0.88-1.09, p=0.73) between OPCAB and ONCAB. At 30-days, no differences between groups were noted in mortality (5 studies pooled OR: 0.90, 95% CI: 0.62-1.31, p=0.59), early myocardial infarction (5 studies pooled OR: 0.95, 95% CI: 0.60-1.51, p=0.82) and renal complications (3 studies pooled OR: 0.74, 95% CI: 0.50-1.11, p=0.14). The need for early repeat revascularization was significantly higher in OPCAB (2 studies pooled OR: 2.58, 95% CI: 1.16-5.75, p=0.02), with higher percentage of incomplete revascularization among OPCAB in both trials included in this pooled result (34% in OPCAB vs 29% in ONCAB, p<0.01).

However, OPCAB showed a tendency for lower risk of early stroke (6 studies pooled OR: 0.70, 95% CI: 0.48-1.03, p = 0.07).

CONCLUSION

Pooling data from RCTs in elderly patients showed that OPCAB and ONCAB provide similar mid-term results. However, OPCAB was associated with a higher risk of early repeat revascularization and there was a trend for reduced early stroke risk. Further randomized studies, specifically designed to include elderly patients, are needed to establish the better CABG strategy.

SERIC LEVELS OF HIGH-SENSITIVITY TROPONIN, N-TERMINAL PROHORMONE OF BRAIN NATRIURETIC PEPTIDE, LACTATE DEHYDROGENASE AND CREATINE KINASE IN ADULT CARDIAC SURGERY

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Keywords: *N-terminal prohormone of brain natriuretic peptide, high-sensitivity Troponin, lactate dehydrogenase, creatine kinase, MACCE*

INTRODUCTION

Cardiac surgery is complex because of prolonged ischaemic times and technical issues. It is important to predict which patients are at risk for short and long-term mortality and major adverse cardiovascular and cerebrovascular events (MACCE).

OBJECTIVES

We aim at evaluate if the serial measurement of troponin, N-terminal pro hormone BNP (NT-proBNP), lactate dehydrogenase (LDH) and creatine kinase (CK) can identify these patients.

MATERIALS AND METHODS

From 27/September/2018 to 15/November/2018, 116 consecutive patients were submitted to cardiac surgery in our centre. We excluded paediatric patients. Seric levels of troponin, NT-proBNP, LDH and CK were measured perioperatively (preop); after surgery (PO0); after 24h (PO1) and discharge (dis). Logistic regression was used to calculate risk factors. Cox proportional hazards models were used to analyse risk factors for late mortality and MACCE incidence. Mean follow-up was 13.2±1.9months.

RESULTS

Mean age was 66.1±10.8 years. Mean Euroscore II was 3.45±4.2% and 63.8% were male. Non-CABG procedures were performed in 64.7%; isolated CABG in 28.44% (42.4% off-pump) and CABG+other in 6.9%. Mean ECC time was 88.5±27.7min and mean aortic cross-clamping 53.1±16.8min. Mean troponin measured Preop, PO0, PO1 and Dis was 37.5ng/dL, 2745.4ng/dL, 6121ng/dL, 507ng/dL, respectively. Mean NT-proBNP was 2832.7pg/dL, 2121.4pg/mL, 3311.5pg/dL, 298pg/dL, respectively. Mean LDH was 245U/L, 376.5U/L; 406.4U/L; 527.1U/L, respectively. Mean CK was 103.7U/L, 543.4U/L; 812.2U/L, 118.8U/L, respectively. Hospital-mortality was 1,7%; 30-day mortality was 1,7%. One-year mortality was 4.3%. One-year MACCE incidence was 6%. Age, max. lactates, PO0-LDH and the difference between PO0-troponin and Preop-Troponin was associated with an increased risk of need for inotropic support in ICU (OR 1.064; 1.875; 1.009 and 1.000 C.I. of 95%). Preoperative ejection fraction and PO0-NT-ProBNP were associated with periods of invasive ventilation>12h (OR 1.008 and 1.000 C.I 95% C.I 95%). Men had a non-significant tendency (p=0.07). Age and PO0-troponin were linked to longer hospital stays. (OR 1.101 and 1.000 C.I 95%). The difference between PO1-NT-proBNP and PO0-NT-proBNP was associated with increased risk for the combined occurrence of MACCE/Mortality at 1-year (OR 1.000 C.I 95%).

CONCLUSION

Age, max. lactates, PO0-LDH and the difference between PO0-troponin and Preop-Troponin was associated with an increased risk of need for inotropic support in ICU. Preoperative ejection fraction and PO0-NT-ProBNP were associated with periods of invasive ventilation superior to 12 hours. Men had a non-significant tendency for periods >12h of ventilation. Age and PO0-troponin were linked to longer hospital Stays. The difference between NT-proBNP at PO1 and PO0 was associated with increased risk for the combined occurrence of MACCE/Mortality at 1-year.

SHORT AND LONG TERM OUTCOMES OF ISOLATED TRICUSPID VALVE SURGERY: REPAIR VERSUS REPLACEMENT

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Keywords: *Tricuspid valve, Tricuspid valve surgery, Tricuspid valve repair, Tricuspid valve replacement*

INTRODUCTION

Tricuspid valve surgery has historically received less attention than other valve surgery. Current practice is largely based on tricuspid valve repair since tricuspid valve replacement has been associated with high mortality and poorer long-term outcomes.

OBJECTIVES

We aimed to compare the short and long-term outcomes of patients who underwent isolated tricuspid valve repair or replacement at our institution.

MATERIALS AND METHODS

This retrospective study included 26 consecutive patients who underwent isolated tricuspid valve surgery from January 1999 to December 2018. Two groups were compared for short and long-term results: Group A - tricuspid valve repair (TVr, 14 patients) and Group B - tricuspid valve replacement (TVR, 12 patients). Clinical, surgical, pre and post-op echocardiographic findings were analyzed.

RESULTS

Groups A and B were similar regarding age (TVr 54.7±15.86 vs. TVR 59±17.03 years; p=0.555) and female sex (TVr 42.9% vs TVR 66.6%; p= 0.225). NYHA III/IV was prevalent in group A (85.7% vs 75%, p=0.635). The mean tricuspid annulus diameter was 43.3±6.58mm in TVr vs 49.8±3.7mm in TVR (p=0.049), left ventricle ejection fraction was 52.71±6.62% vs 57±9.11% (p=0.127) and moderate to severe right ventricular dysfunction was present in 0% vs 33.3% of patients (p=0.033). The mean extracorporeal circulation time was 58.69±21.6min for TVr vs 84±30.5min for TVR (p=0.026) and aortic cross-clamp time was 24.09±4.06 vs 38±31min (p=0.139). Cardioplegic arrest was used in all but 2 patients in TVr vs 3 in TVR, in whom ventricular fibrillation was used. In the TVr group, a tricuspid ring annuloplasty was performed on 12 patients and De Vega in 2 patients. In all cases of the TVR group, bioprostheses were used. In the first 24 hours, inotropic support was used in 21% in TVr vs 50% of TVR patients (p=0.218) and 7% vs 25% of patients (p=0.306) needed permanent pacemaker due third-degree atrioventricular block. There was no peri-operative mortality in either group and 30-day mortality was 7.1% for TVr (1 patient) vs 16.7% in TVR (2 patients; p=0.580). After a follow-up of 5.2±5.5 years, late mortality was 21.42%, (3 patients) vs 25% (3 patients; (p=1.000), respectively. Only 1 patient required reoperation: the ring was removed and the valve was replaced. Survival at 10 years was 85.7± 9.4% vs 75±12.5%, respectively for the TVr and TVR groups (p=0.810).

CONCLUSION

Survivors had significant improvement in the NYHA class and freedom from right heart failure symptoms, similar for both groups. TVR was associated with higher 30-day and late mortalities.

IMPACT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN PATIENTS WITH CORONARY ARTERY DISEASE SUBMITTED TO CORONARY ARTERY BYPASS GRAFT

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Keywords: *coronary artery disease, coronary artery bypass graft, chronic obstructive pulmonary disease*

INTRODUCTION

The association between chronic obstructive pulmonary disease (COPD) and coronary artery disease (CAD) as long been recognized, as such it is included in most risk prediction models. Still the extent of such association remains mostly unknown.

OBJECTIVES

To analyze patients submitted to coronary artery bypass graft (CABG), comparing those with COPD and those without, in terms of severity of disease, risk factors, surgical outcomes and complications.

MATERIALS AND METHODS

The records of 11545 consecutive patients were identified and retrieved for analysis from our institutional prospective CABG registry since January 1st 1990 to December 31st 2016.

RESULTS

The prevalence of COPD was 3.5% (403 patients). Considering CAD risk factors, there was no difference in terms of prevalence of diabetes, arterial hypertension or previous acute coronary syndromes. The prevalence of smoking was significantly higher in the group of COPD (59.3% vs. 47.3%; P<0.001) such as dyslipidemia (68.9% vs. 60.8%; P=0.001) and cerebral or peripheral arterial disease (P<0.05). The use of internal mammary artery was less frequent in the group of COPD (P<0.001). The extracorporeal circulation time was greater in COPD patients (62.9±27.4 vs. 60.9±26.0; P=0.004). There was no significantly difference in the operative mortality. The incidence of inotropic or mechanical support or reoperation due to haemorrhage was similar between the two groups. A significant difference existed in the number of pulmonary complications (6.7% vs. 1.6%; P=0.001), of acute respiratory failure (2.9% vs. 1.6%; P<0.001) and of acute renal lesion (7.4% vs. 4.1%; P=0.027). The mean hospital stay was significantly higher in the COPD group (8.4 ± 7.6 days vs. 7.3 ± 6.1; P<0.001).

CONCLUSION

Although the COPD is usually reported as an important risk factor in CABG for mortality, in this study we presented similar results about mortality. However COPD is associated with worse CAD, more risk factors and complications. This requires better preoperative optimization and more careful surgery and postoperative period.

CYTOSORB® AS A SAFEGUARD FOR EMERGENT CARDIAC SURGERY PATIENTS UNDER TICAGRELOR

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Keywords: *Cytosorb, Ticagrelor, Emergent cardiac surgery, Bleeding*

INTRODUCTION

The latest guidelines recommend the use of antiplatelet therapies, such as ticagrelor, in the treatment of acute coronary syndromes. The widespread use of this treatment has led to challenges in emergency cardiac surgeries, as patients under its effect have an increased risk factor for bleeding. Recent experience shows that the Cytosorb® adsorption system can be a valid solution to remove ticagrelor, thus reducing bleeding complications.

OBJECTIVES

The aim was to assess our results with sorbent hemadsorption using the Cytosorb® system during emergency cardiac surgeries in patients at high-risk bleeding due to treatment with ticagrelor.

MATERIALS AND METHODS

Retrospective analysis of 10 patients, who were submitted to emergent cardiac surgery under ticagrelor, where we used the Cytosorb® system. Cases were registered between 1 June 2020 and 31 July 2021.

RESULTS

The mean age of the patients were 60,3±13,2 years and 70% were male. All of them were on CCS III/IV classification. The mean EuroSCORE II was 19,64%. In our series, 5 patients suffered from acute coronary syndrome (including 1 with ventricular septal rupture and 1 with severe mitral regurgitation); 4 patients had type A aortic dissection and 1 patient was diagnosed with mitro-aortic endocarditis. Patients were submitted to aortic dissection correction (n=4), myocardial revascularization (n=3), myocardial revascularization with mitral valve replacement (n=1), ventricular septal rupture closure (n=1) and mitral and aortic valve replacement (n=1). The most common cardiac complications were need for inotropic support longer than 48 hours (80%), acute renal failure (50%) and prolonged ventilation (40%). In what concerns bleeding complications, the average draining volume was 1408,1±487,4ml. Only 1 patient required revision for bleeding. Mean ICU stay was 8,3±7,4 days and the total length of stay was 12,4±8,7 days. 3 patients died during the first 30 days post-surgery.

CONCLUSION

Cytosorb® appears to be safe and effective for aiding bleeding control in patients at high risk of bleeding because of ticagrelor antiplatelet effect. Therefore, when Cytosorb® is available, there are no reasons to postpone or refuse emergency cardiac surgeries to these patients.

SIMULTANEOUS CARDIAC AND THORACIC SURGERY, OUR EXPERIENCE

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Keywords: *Simultaneous Cardiac Thoracic Surgery*

INTRODUCTION

A separation between Cardiac and Thoracic Surgery departments and providers has been happening around the world and in our country, with training already divided, detaching from the previous role of a cardiothoracic surgeon. In spite of this, a need for a conjoint action rises every so often, where a patient requires both specialties around the same time. In emergent cases, there is less debate for the simultaneous versus sequential approach. On the other hand, elective and urgent cases provide the basis for discussion on which way to provide care.

OBJECTIVES

In this study, we looked retrospectively at all the patient cases that were operated at our institution with the simultaneous collaboration of Cardiac and Thoracic Surgery departments, in a span of 4.5 years. Our goal was to try to identify any obvious disadvantages of working in this setting, either intra-operatively or in the post-operative period.

MATERIALS AND METHODS

We collected a pool (n = 7) of patients that matched our criteria (non-emergent cases of surgery with a cardiac and a thoracic team working simultaneously, from 2017 to mid-2021). We characterized this pool by age, gender and risk factors profile. We also documented the severity of their symptoms via the New York Heart Association (NYHA) classification as noted on the charts at the time, and we stratified the pre-operative risks using the EuroScore II and the Society of Thoracic Surgeons (STS) score.

RESULTS

We found out that intra-operatively there were no major complications arising, and that operative times did not exceed the common duration, varying according to surgery and ranging between 170 and 300 minutes. Blood loss was registered ranging from 496 to 2210 mL. The postoperative period was spent with an average Intensive Care Unit (ICU) time of 2 days - as is typically - with patients being extubated on average 7.4 hours after surgery. A mean of 7 days was recorded as hospital stay after surgery, which reflects that there was not a prolonged period of admission after the surgeries.

CONCLUSION

These results led us to conclude that simultaneous cardiac and thoracic surgery seems a safe approach, reducing the number of times the patient is submitted to surgery and consequently its inherent dangers, anesthesia and hospital stay. All while not prolonging the time for recovery, nor giving rise to unexpected complications. This work is facilitated in a big center such as ours, which grants the availability of both specialties in the same hospital, expediting patient care.

MIDCAB: AN OVERVIEW OF THE FIRST 50 PATIENTS IN CHVNG/E, E.P.E.

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Keywords: *Minimal Invasive Surgery, Coronary Artery Bypass*

INTRODUCTION

Two years after the first minimally invasive direct coronary artery bypass (MIDCAB) through left minithoracotomy was performed in our centre, we present our first 50 patients treated with this technique.

OBJECTIVES

In this study our aim was to evaluate both pre-operative data and post-operative outcomes of individuals submitted to MIDCAB.

RESULTS

Most of our patients had a personal background of other diseases (hypertension, dyslipidemia and diabetes being the most common) in addition to myocardial ischemia. 22 patients had a previous myocardial infarction, 14 of these in the last 6 months prior to this revascularization.

The mean time of surgery was 150 minutes and the patients spent an average of 48 hours in ICU care with a total mean time of hospitalization of 5 days. One patient was submitted to concomitant removal of a fibroelastoma and closure of FOP, while other patients were treated using a two-staged approach – 5 patients had hybrid revascularization with PCI and 3 were submitted to TAVI during the same admission.

Post-operative complications were rare. The most common complications were development of atrial fibrillation (8 patients) and dehiscence/infection of the operative wound (7 patients), followed by renal impairment (3 patients) and post-operative bleeding (1 patient). The only re-admission was due to Dressler syndrome. No patients had new ischemic events in the 30 days after surgery and only 1 patient died in this time period (cause of death unknown).

CONCLUSION

MIDCAB is a safe and efficient alternative to standard CABG and long term studies have shown great results and long-time patency of conduits. This technique can be used as part of a minimally invasive strategy for selected patients, combined with either other open procedures (such as MIMVR) or percutaneous treatment (PCI, TAVI…).

Our data is still small with only short to mid-term follow up, nonetheless our results are consistent with other centers with more years of this practice. Despite its learning curve it is a reproducible and safe approach in which we are eager using and developing by adding other variants.

BITA IN DIABETIC PATIENTS – A RISK WORTH TAKING?

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Keywords: *diabetes, Cardiac surgery, BITA, Coronary Surgery*

INTRODUCTION

Bilateral internal thoracic artery (BITA) grafting remains controversial in diabetic patients undergoing cardiac revascularization.

OBJECTIVES

In this study we aimed to understand whether the cumulative risks of diabetes and BITA grafting was too high to outweigh the potential long-term benefits.

MATERIALS AND METHODS

Patients submitted to isolated coronary bypass (CABG) from January 2000 to November 2015, in a single center, were compared across 68 variables. The study compared morbidity and mortality between (1) diabetic patients grafted with BITA vs left internal thoracic artery only (LITA) and (2) diabetic BITA patients vs non-diabetic BITA patients. Operative mortality, postoperative inotropic support, perioperative bleeding, sternal dehiscence, deep sternal infection, renal failure and long-term survival (1-year and 5-year survival) were compared.

RESULTS

In our study period 1179 consecutive diabetic patients were submitted to CABG, including 228 BITA grafts (19,3%). These patients were compared to 751 non-diabetic BITA patients grafted during the same period.

Diabetic patients receiving BITA grafts were shown to have an improvement in 5-year survival compared to LITA only patients (BITA 1792 ± 11 vs non-BITA 1716 ± 11 days, $p<0.01$). Although 1st-year survival was non-significant a trend was noted (BITA 364 ± 0.70 vs non-BITA 359± 1,3 days, $p=0.05$). Diabetic patients submitted to BITA were found to have a higher risk of postoperative bleeding with 8/228 BITA patients needing surgical revision vs 7/951 non-BITA (3,5% vs 0,7%, $p<0.01$). Increased CPB time was also associated with BITA grafting (51,34 ± 0,60 vs 68,70 ± 1,04 min; $p<0,01$). No other differences in postoperative morbidity or early mortality were found.

No differences were found in either morbidity, early mortality or long-term mortality while comparing diabetic BITA patients vs non-diabetic BITA patients.

CONCLUSION

In this single-center analysis, BITA grafting was associated with better long-term outcomes in diabetic patients. Although BITA was associated with a higher perioperative bleeding risk, no differences in early-mortality or morbidity were observed between diabetic and non-diabetic BITA patients.

This study provides further evidence that BITA should not be excluded from the treatment of higher-risk CABG patients, such as diabetic patients.

PATIENT BLOOD MANAGEMENT(PBM): IMPLEMENTATION AND FIRST YEAR RESULTS IN A CENTRAL HOSPITAL

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Keywords: *Anemia, Blood Loss, Blood Tranfusion, Cardiac Surgical Procedures*

INTRODUCTION

Since ancient times, a magical relationship between blood and life has always been established.

Blood is an imminently scarce, expensive and with risks associated with its use. It is desirable that the transfusion practice be based on evidence-based clinical guidelines. From January 2019, a multidisciplinary group of doctors began the PBM in cardiac surgery and in structural intervention cardiology. The PBM program was created based on three strong pillars defended by Goodnough and Shander: maintain hemoglobin concentration, optimize hemostasis and minimize blood loss.

OBJECTIVES

Our goal is to share our experience in implementation of a PBM program and present the first year of results.

MATERIALS AND METHODS

The data we analyzed belong to a cohort of consecutive patients undergoing cardiac-surgery between January of 2019 and March of 2020. The primary endpoints of the study were hemoglobin at pre-anesthetic consultation, at pre-operative visit and at discharge, red blood cell (RBC) transfusion rate and mean hospital stay.

RESULTS

178 patients were proposed to pre-anaesthetic evaluation. In preanesthetic assessment 39.9 % had anaemia (mean Hb: 13.3 mg/dL) and was treated in haematology day hospital: IV iron (25.3 %), erythropoiesis-stimulating agents (17.4 %). In Preoperative assessment a mean Hb of 13.6 mg/dL was statistically different from Hb distribution at preanesthetic assessment (p-value = 0.04). Red blood cell transfusion rate after PBM was 45.5 % (10.7 % of patients received one unit). After PBM, patients had a 29 % reduction on the odds of red blood cell transfusion when comparing with the period before and a mean hospital stay of 6.7 days. For each unit transfused the hospital stay increase 0,77 days. A total of 93.8 % was anaemic at discharge (mean Hb: 10.5 mg/dL).

CONCLUSION

Excellent preliminary clinical and financial results was observed, which with a direct and indirect population of 1200000 users, estimated savings of 4.9 million euros/year in the CHVNGE. The goal of extending to all medical and surgical areas will not only improve the overall health of patients but it is a measure of sustainability for the hospital and the blood banks.The importance of anemia has raised from being an insignificant comorbidity to a manageable treatable disease of high importance. Although anemia appears to increase mortality in cardiac patient up to five times, there is no evidence that prophylactic correction of anemia with RBC transfusion reduce the mortality.PBM is standard of care, representing a hardworking modification in our medical culture.

COMPARISON OF OUTCOMES AFTER SUTURELESS VERSUS STENTED AORTIC BIOPROSTHESES IN OCTOGENARIANS

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Keywords: *sutureless; outcomes; octogenarians; aortic valve*

INTRODUCTION

Owing to the increased life expectancy of the population, clinicians are confronted by the challenges of treating older patients with multiple comorbidities.

The Perceval (PCV) bioprosthesis (LivaNova, Saluggia, Italy) is a sutureless aortic valve bioprosthesis that has been developed to overcome the increased surgical risk, by reducing cardiopulmonary bypass (CPB) and aortic cross-clamp (ACC) times. However, literature has not yet established significantly better outcomes with PCV compared with conventional stented bioprostheses.

OBJECTIVES

Analyze and compare early and late outcomes after aortic valve replacement (AVR) using Perceval or Perimount Magna (PM) bioprosthesis (Edwards Lifesciences, Irvine, CA, USA) in octogenarians.

MATERIALS AND METHODS

Single centre retrospective study of all patients ≥ 80 years who underwent single AVR ou AVR with CABG using PCV or PM between 2014 and 2020. Initial population:177 patients. Exclusion criteria: reoperations (n=4), emergency procedures (n=2), active endocarditis (n=3). Final population:168 patients.

Primary outcomes: perioperative MACCE and long-term mortality. MACCE was defined as a composite endpoint including at least one of the following in-hospital variables: all-cause mortality, reoperation, stroke, myocardial infarction, multiple organ failure, cardiac arrest and need for hemodialysis. Mean follow-up for all-cause mortality: 3 years.

Secondary outcomes: perioperative blood loss, surgical and in-hospital stay times, incidence of moderate leak and pacemaker implantation.

Univariable analysis was developed to compare the two different groups.

RESULTS

Of the 168 patients, PCV was implanted in 81 and PM in 87 patients. Thirty-three (19.6%) patients were submitted to AVR with CABG (PCV:15 patients and PM: 18). The PCV group was older ($p<0.001$) with more peripheral arterial disease ($p<0.001$). All other preoperative demographics were similar in both groups.

The type of bioprosthesis did not have an impact on MACCE ($p=0,483$), but PCV group was associated with need for hemodialysis ($p=0,021$). No differences related to long-term mortality were found ($p=0,243$).

The mean blood loss was similar in both groups ($p=0,490$). PCV group was associated with lower mean CPB ($p<0.001$) and ACC ($p<0.001$) times. Mean hospital stay was not different ($p=0,349$). No differences were found correlated to incidence of moderate leak ($p=0,531$) and pacemaker implantation ($p=0.473$)

PCV group was associated with more ministernotomy approach ($p<0.001$). Ministernotomy, lower CBP and ACC times were predictors of lower incidence of MACCE ($p=0,043$, $p=0,044$ and $p=0,025$, respectively), but with no impact for mortality.

CONCLUSION

In this study, despite AVR with the sutureless prosthesis resulted in shorter aortic CBP and ACC times, clinical outcomes were similar compared to stented bioprostheses in our elderly patient population

PREVENTION OF STERNOTOMY DEHISCENCE WITH NEGATIVE PRESSURE WOUND THERAPY IN NEONATES

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Keywords: *Closed Postponed, Negative Pressure Wound Therapy, Prevention, Sternotomy Dehiscence*

INTRODUCTION

Surgeries in neonates are always covered with great complexity, and cardiac surgery itself is an added factor of complexity. Due to the complexity of the surgery, the chest closure is postponed about 72 hours after the end of the procedure. Not closing the surgical incision for so long causes a significant increase in the risk of dehiscence of the sternotomy by more than 50%, increasing also the risk of infection. All complications resulting from a dehiscence cause an increase in length of stay, social and health costs, and decreasing in the quality of life of the neonate and his/her family. Prevention is the key point for this complications and using negative pressure wound therapy could be the answer.

OBJECTIVES

This study report the experience using closed incisional negative pressure wound therapy over postponed closed sternotomy, in neonates after cardiac surgery, for prevention of infection and dehiscence.

MATERIALS AND METHODS

Study review of use of negative pressure wound therapy to prevention of dehiscence and infection of sternotomy in neonates after cardiac surgery with postponed closed.

RESULTS

All neonates, between January of 2019 and September of 2021, used negative pressure wound therapy with 25mmHg and was possible take off all suture material 15 days after sternotomy closing, with one change of the dressing after the first seven days. It was possible to make the dressings with the thoracic drains, and even take off them without move the dressing. For this technique we used a bridge system that allows a window for echocardiograms. Three neonates had a dehiscence without infection of the sternotomy after using this method.

CONCLUSION

Using incisional negative pressure wound therapy is very important to prevent wound dehiscence in neonates, we saw that is the better way to target our goals, reducing the length of stay, the health costs but offering the best quality of life to neonates and families after cardiac surgery. At this time we are developing a protocol to use this method in all neonates after cardiac surgery.

AORTIC DISSECTION COMPLICATING AN AORTIC COARCTATION: A NOVEL APPROACH TO A RARE PATHOLOGY

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INTRODUCTION

Acute dissection complicating an aortic coarctation is a rare pathology that requires complex surgical treatment. This combination poses a technical and strategical challenge when it comes to obtaining satisfactory exposure of the structures, assuring perfusion of the upper and lower body and deciding the timing and order of the repair.

We report the case of a 42-year-old man admitted to the emergency department with a 2-day history of pleuritic chest pain in his left hemithorax and precordial region. The workup included a chest computed tomography which showed an aortic coarctation of the descending thoracic aorta as well as an aortic dissection starting at the arch (proximal to the origin of the left subclavian artery) and extending to the coarctated area. There was no apparent involvement of the supraaortic branches or the remaining aorta. An echocardiogram showed mild dilation of the sinotubular junction with no apparent dissection, as well as a bicuspid aortic valve with mild regurgitation. Cardiac function was normal. The patient was stabilized and submitted to corrective surgery.

A clamshell incision was performed to allow adequate exposure of all relevant structures. Simultaneous arterial cannulation of the ascending aorta and descending thoracic aorta was achieved through a Y-tubing connection. The right auricle was canulated for venous return. The patient was placed on cardiopulmonary bypass and cooled down to 28°C. The aortic arch was clamped between the brachiocephalic trunk and the aneurysm, distal to the coarctation. A tubular prosthesis was proximally anastomosed to the aorta with a continuous suture whilst antegrade unilateral cerebral perfusion was maintained through the brachiocephalic trunk for 15 minutes. Afterwards, the clamp was moved further down to the prosthesis, enabling bilateral cerebral perfusion. The left subclavian artery was detached from the arch and selectively perfused whilst the descending aortic aneurysm and coarcation were excised and the conduit was distally anastomosed. The left subclavian artery was then reimplanted on the prosthesis. The patient was successfully weaned off bypass with no inotropic support, made an uneventful recovery and was discharged home on the 10th postoperative day.

CONCLUSION

The combination of aortic coarctation and dissection has been previously treated with either a 2-stage repair or a single surgery involving extraanatomical bypassing or circulatory arrest. Through the use of a clamshell incision, exposure to all relevant structures was achieved, whilst the simultaneous and selective perfusion methods allowed for a complete repair, without the need for circulatory arrest and deeper hypothermia.

SURGICALLY TREATED CARDIAC MALIGNANCIES – A SINGLE CENTRE CASE SERIES

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Keywords: *Cardiac sarcoma, Cardiac lymphoma, Cardiac malignancy*

INTRODUCTION

While most cardiac neoplasms are benign, a minority are malignant, most often cardiac sarcoma. These tumours have high metastatic potential and recurrence rates. Other malignant neoplasm that can also arise in the myocardium are Immune cell malignancies.

OBJECTIVES

We present a single cardiac surgery centre series of surgically approached malignant neoplasms from 2015 to 2021.

MATERIALS AND METHODS

We collected from our database Cardiobase® all the data concerning surgeries with resection, partial or complete, or biopsy of any cardiac tumours, between 2015 and 2021, and selected the primary malignant tumour cases.

RESULTS

Out of a total of 83 surgeries, 7 had a histological diagnosis of a primary malignancy, 5 of which were cardiac sarcomas and 2 cardiac lymphomas.In the sarcoma group, 3 patients were female and the median age was 58 years. Complete resection was achieved in 4 patients, followed by adjuvant radiation or chemotherapy in all patients. 3 patients died during follow-up, median of 57 months, with disease recurrence and metastatization; one is receiving salvage chemotherapy for recurrence and one is still alive and in remission.

In the lymphoma group one patient was female. The patients were 56 and 77 years old. After surgical intervention, one patient has been in remission for 24 months and the other is currently undergoing chemotherapy, 5 months after diagnosis.

CONCLUSION

Cardiac malignant disease remains a rare diagnostic and therapeutic challenge. Thorough surgical excision when feasible and expeditious transfer to sarcoma or lymphoma specialists are of paramount importance. Sarcoma recurrence is common and can occur years after disease remission, being the main cause of death in our series.

AORTIC REGURGITATION, ISCHEMIC HEART DISEASE AND 15% LEFT VENTRICLE EJECTION FRACTION: WHAT TO DO?

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Keywords: *Aortic regurgitation, ischemic heart disease, LV aneurysm, Dor procedure*

INTRODUCTION

Poor left ventricle (LV) ejection fraction has different degrees of severity and may have different anatomic substrates: ischemic myocardium, hibernated myocardium, partial or full thickness myocardial infarction, scar tissue, ventricle aneurysm or pseudo aneurysm. Distinction between viable and non -viable myocardium is not easy.

CASE REPORT

1st diagnosis - We present the case of a 65-year-old woman, admitted to another hospital with symptoms of new onset congestive heart failure. Echocardiography demonstrated severe aortic regurgitation (AR) due to rheumatic valve disease and severely dilated LV with a very poor LV function (22% LVEF). In coronary angiography, a sub-occlusive lesion in the left anterior descending artery (LAD) and 50-70% lesion in the right coronary artery (RCA) were identified. Myocardial perfusion scintigraphy showed evidence of previous myocardium infarction, with no viability in the apex, as well as in the apical and medial segments of the anterior and inferior walls. It seemed an impossible situation, and surgery was denied.

2ND DIAGNOSIS

Second referral to our hospital – it was discussed whether the poor function of the dilated LV could be due to long standing AR, ischemia and infarction of the anterior wall and to a reasonably well shaped apical LV aneurysm. A transoesophageal echocardiogram and cardiac magnetic resonance were performed and showed: severe AR with a regurgitant volume of 65 ml, a large apical LV aneurysm with 15% LVEF, preservation of contractility of the basal segments of the anterior, lateral and inferior walls of the LV, partial viability of the anterior wall, and absence of mitral regurgitation. A small atrial septal defect (ASD) was also diagnosed. As there were no other co-morbidities, surgery was deemed viable.

SURGICAL PROCEDURES

A plan to repair all pathologies was made to enhance myocardial protection:

1st- The aorta was opened, cardioplegia administered through the coronary ostia, a bioprosthetic aortic valve was implanted and the aorta closed; 2nd Resection of the aneurysm with LV reconstruction with circular bovine patch (Dor procedure); 3rd ASD closure; 4th Two bypass grafts: left internal mammary artery (LIMA) to first diagonal and saphenous vein to posterior descending artery.

Surgery was uneventful and the patient was transferred to the original hospital at postoperative day 12.

CONCLUSION

The presence of a large LV aneurysm with a remaining reasonably good LV function was the key to make the correction possible. A well-planned sequence of the surgical procedures allowed for a very good result.

INITIAL EXPERIENCE WITH THE E-VITA OPEN NEO HYBRID PROSTHESIS

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Keywords: *Aorta, Frozen Elephant Trunk, E-vita OPEN*

INTRODUCTION

The treatment of complex aortic pathology using the Frozen Elephant Trunk (FET) technique has become more popular in recent years. Even after overcoming the learning curve inherent to this surgery, it remains technically complex and extensive. The appearance of second-generation prostheses, with branches for visceral perfusion and for the reimplantation of supra-aortic trunks, tries to address this issue.

OBJECTIVES

Review the first patients submitted to FET surgery in our Department with the E-vita OPEN Neo prosthesis.

MATERIALS AND METHODS

From June 2011 to October 2021, 60 FET were performed in our Department. In this series, E-vita OPEN Neo Trifurcated prostheses was used in the last 3 patients. The remaining had the E-vita OPEN Plus prosthesis implanted.

All patients underwent their first postoperative CTA prior to hospital discharge. Follow-up consisted of presential and/or telephone consultations with CTA at 6-month and annually thereafter.

The surgical times of extracorporeal circulation (ECC), aortic cross-clamping (AC) and cardiocirculatory arrest (CCA) of these patients were compared with the last 30 patients performed with the E-vita OPEN Plus prosthesis.

RESULTS

Patients' pathology consisted of 1 case of aneurysmal disease, 1 case of chronic type B dissection and 1 case of large atherosclerotic penetrating ulcer. Two patients were female and 1 was male. The average age was 59,3 years.

Mean extracorporeal circulation time was 207,6 (29,5) min, with mean clamping time of 114,0 (20,5) min and 33,6 (5,1) min mean cardiocirculatory arrest time in moderate hypothermia (26-27°C) with bilateral antegrade cerebral protection. When compared to the group of patients with E-vita OPEN Plus, it represents an average decrease of 40,1 minutes in CPB, 22,2 minutes in AC and 6,7 minutes in CCA.

The only recorded complication was transient paraplegia in two patients. There was no in-hospital mortality. During the entire follow-up, no complications were detected in these patients.

CONCLUSION

The new E-vita OPEN Neo prosthesis allows the FET technique to be performed in an easier and faster way, however, it is required a larger volume of patients and more extensive follow-up to verify its impact at long term.

MANAGEMENT OF SYMPTOMATIC SACCULAR ANEURYSMS OF TRANSVERSE AORTIC ARCH

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Keywords: *Saccular Aneurysms, Transverse Aortic Arch, Open Repair*

INTRODUCTION

Isolated non-traumatic aortic arch aneurysm represents a rare clinical entity. Majority of arch aneurysms exist as distal extensions of more proximal aortic disease. Saccular aneurysms have a higher risk of rupture because of their etiological origin and advanced wall stress compared to fusiform aneurysms

OBJECTIVES

The literature has suggested that the management of saccular aneurysms with surgical repair is a more reasonable option.In this presentation, we shared the surgicaltechnique and clinical management in the treatment of patient with a symptomatic saccular aneurysm of aortic arch.

MATERIALS AND METHODS

A 67-year-old male came to emergency polyclinic. His had nonspecific chest pain, dyspnea and fewer for 3 days. He had a medical history of hypertension and chronic renal failure. But there was no known history of chest pain, hypertension, congenital heart disease, trauma or stroke. His blood pressure was 180/110 mmHg under medication. Standard anteroposterior chest radiography showed a widened mediastinum and pulmonary infiltration lines. First thoracic aneurysm was suspected, but his 10 months earlier thoracic computerized tomography (CT) was normal. Echocardiography showed no regional wall motion abnormalities, normal valve function, and aortic pathology could not be demonstrated . We performed a low-contrasted computerized tomography (CT) scan for eliminate any aortic aneurysm or Covid-19 infection. And isolated saccular aneurysm at the aortic arch was incidentally detected . The aneurysm dimensions were 25x33x35mm.

RESULTS

First median sternotomy for approaching aneurysm was done, then right axillary artery and the right atrium were cannulated. By starting cardiopulmonary bypass brachiocephalic artery was explored and rounded with nylon type and then aneurysm was dissected. The diameter of the saccular aneurysm was approximately 4 cm. aorta cross clamp was clamped and antegrade crystalloid cardioplegia was given. The saccular region of the arch was opened and aortic repair using a Dacron patch graft (Figure 2A, 2B). CPB and aortic cross-clamp time were 45 and 25 minutes respectively, with deep hypothermic circulatory arrest (DHCA) of 19 minutes. His post-operative care was uneventful. Postoperative 3th day non- contrasted computerized tomography (CT) scan was performed for control of aneurysm(Fifur3). Then he was discharged 7th days after surgery.

CONCLUSION

Open surgery remains the standard therapy for isolated saccular aortic arch aneurysm. We operatively repaired a isolated aortic arch saccular aneurysm of a male patient with chronical renal insuffiancy. This case required urgent surgery due to the presence of uncontroled hypertention and thoracic back pain.

SUPPLEMENT

ABSTRACTS OF THE SPCCTV 4D VISIONS 2021

VISIONS 21

THORACIC SURGERY

SURGICALLY RESECTABLE THYMOMAS – EPIDEMIOLOGICAL AND PATHOLOGICAL FEATURES OF A 5-YEAR CASE SERIES AT CENTRO HOSPITALAR E UNIVERSITÁRIO DE COIMBRA

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Keywords: *Thymoma, Pathology*

INTRODUCTION

Thymomas are rare indolent neoplasias with an incidence of 1.7 cases/million in Europe. Still, they are the most common tumors on the anterior mediastinum, and surgery is the gold standard for resectable disease.

OBJECTIVES

This study aims to describe the epidemiological and pathological features of surgically resectable thymomas diagnosed from 2016 to 2020 at Centro Hospitalar e Universitário de Coimbra (CHUC).

MATERIALS AND METHODS

We searched Pathology registries for thymomas diagnosed in surgical biopsies or resections from 2016 to 2020. Pathological reports and slides were reviewed to update the classification according to the 5th edition of WHO Classification of Tumors. We applied TNM, AJCC 8th edition and Modified Masoaka staging systems to all cases.

Statistical analysis was performed using SPSS (v.27). We used Chi-square and Fisher's Exact to examine contingency tables and Wilcoxon and Mann-Whitney to compare medians between groups. A p-value inferior to 0.05 was considered statistically significant.

RESULTS

Our series comprises 48 thymomas diagnosed in 25 women and 23 men. Patient's median age at diagnosis was 65 years old (range: 23 - 85), significantly higher than the median age of 58 years reported in the literature ($Z = -2.943$, $p = 0.003$). Further studies will be necessary to determine if this represents an actual populational difference.

AB thymoma was the most prevalent histologic subtype in our series, accounting for 31.3% of all cases, followed by B1 thymomas (27.1%). All subtypes frequencies are within the ranges of published data.

Regarding pTNM, 45 cases (93.8%) were staged pT1a; the other 3 showed contiguous lung invasion (pT3). Masoaka classification, which considers transcapsular invasion, subdivides AJCC Stage I disease into Masaoka Stage I and II. In our series 33 thymomas were stage I by AJCC, 10 of which showed transcapsular microscopic invasion (Masaoka stage II). As Masaoka is still the most widely accepted system for clinicians, further studies must establish if it impacts prognosis more relevantly than the AJCC system.

Surgical margins status is the most important predictor of outcome. In our series, completeness of resection was achieved in 45 cases (93,8%), 2 cases were R1, and one specimen could not be evaluated due to extensive fragmentation.

CONCLUSION

We reported a Portuguese case series on resectable thymomas and reported a higher diagnostic age than established literature. More extensive studies and association with clinical elements, including symptoms and follow-up data, are needed to understand possible geographical differences and enveil the staging significance of the systems in use.

PULMONARY ARTERY SARCOMA WITH SEVERE SECONDARY PULMONARY HYPERTENSION - CASE REPORT OF A MULTIMODAL TREATMENT.

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Keywords: *Lung sarcoma, Pulmonary hypertension, Lung complex resection*

INTRODUCTION

Pulmonary artery sarcomas are very rare tumors. Its presentation is aggressive, and it has a poor prognosis due to its late detection and misdiagnosis.

OBJECTIVES

We report a multimodal approach of a pulmonary artery sarcoma with secondary pulmonary hypertension (PH) in a young female.

MATERIALS AND METHODS

We report a case of a 34-year-old female, with no previous medical history. The patient reported asthenia and chest pain for 3 months. Clinical and radiological investigation through CT and PET showed a 6,8x 5,3x 4,5cm central mass, arising from the anterior aspect of the right main bronchus to the carina, with invasion of the right pulmonary artery (PA) with max SUV of 8. Transthoracic biopsy revealed an undifferentiated sarcoma. PASP was 99mmHg on echocardiogram.

Regarding unresectable disease, the multidisciplinary team agreed on induction chemotherapy. After 5 cycles of chemotherapy, both cardiac MRI and chest CT showed stable dimension of the mass and regression of invasion of PA. Pre-operative assessment showed a PASP of 51mmHg, FEV1 of 71% and DLCO of 48%.

We performed an upper bilobectomy through a Clamshell incision. We identified a mass with approximately 7cm of diameter that extended through the right main PA and projected proximally inside its lumen and distally to the intermediate PA. After heparin administration, right main PA was isolated inside the pericardium and an incision was made in the lateral wall of the right PA, including the origin of its anterior trunk. Other segmental arteries, upper and middle veins and bronchi were sectioned by the regular technique. Defect in the PA was then closed with bovine pericardium, allowing preservation of the lower lobe. Mediastinal lymphadenectomy was completed.

RESULTS

Patient was discharged twelve days after surgery, showing no complications during her in-hospital stay. Post-operative echocardiogram showed a 43mmHg PASP.

Pathologic results showed a fusocelular sarcoma of the pulmonary artery intima, with high grade malignancy, excised with clear margins. Lymph node disease was not found.

21 days after surgery she developed fever and was diagnosed with pulmonary valve endocarditis, having then completed 4 weeks of antibiotics with full recovery.

CONCLUSION

Multi-disciplinary approach and multi-modal treatment are a fundamental tool in the treatment of all cancer patients, particularly in rare tumors.

A specialized thoracic team should be included, to establish true resectability potential and lung parenchyma sparing even in central tumors.

RELATIONSHIP BETWEEN PRIMARY SPONTANEOUS PNEUMOTHORAX AND PECTUS EXCAVATUM

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Keywords: *Pneumothorax, Pectus Excavatum, Thoracic Surgery*

INTRODUCTION

Pectus excavatum (PE) is the most common congenital chest wall deformity with a higher prevalence in males[1]. Haller index (HI) is used to measure the severity of the chest deformity and some authors suggest surgery should be recommended when HI is above 3.25. HI was defined as the widest transverse diameter of the internal chest divided by the distance between the anterior spine and posterior sternum [2].

Primary spontaneous pneumothorax (PSP) is usually caused by a rupture of apical subpleural blebs and it is more prevalent in tall, thin, young males[4].

Pathogenesis of both PE and PSP is still unclear but a higher incidence of PSP in PE patients has been reported [4], as also a higher mean HI is reported in PSP patient [5,6]. A higher HI was associated with an increased risk of bleb formation and PE patients with blebs had a higher risk of developing PSP [5].

MATERIALS AND METHODS

We report a case of an 18-year-old male referred due to self-intention of aesthetic correction of his symmetrical PE. Of his medical history, one must recall 3 episodes of pneumothorax (2 on the left side) without any surgical evaluation. CT scan showed healthy lung parenchyma with no macroscopic blebs and a HI of 4,3. Electrocardiogram and echocardiogram were normal.

The patient underwent simultaneously left pleurodesis with apical wedge resection (blebs were found intraoperatively) by video-assisted thoracic surgery (VATS) and Nuss procedure (with 2 Lorenz bars), without any complication and with a good aesthetic result. The chest drain was removed 2 days after surgery and the patient was discharged on day 4th. After 2 years he did not have more episodes of pneumothorax and he awaits bars removal.

RESULTS

High apical stress may lead to pleural buckling and bulla formation[7] and longer and flatter chest shape that also resulting in a higher HI may affect the distribution of stress in the lung and result in the development of PSP [7,8].

PSP can be complicated and life-threatening after the Nuss procedure, especially because the risk of bilateral pneumothorax. Some authors suggest simultaneous surgery also to maximize the potential effects of minimally invasive surgery [9].

CONCLUSION

Although PE and PSP have similar demographics the exact association between these two entities is not clear. However, when evaluating a PE patient with a high HI, bleb formation should be carefully assessed although there is no evidence for prophylactic resection in these patients [5].

A RARE CASE OF A HUGE MASS OF ANTERIOR THORACIC WALL – LOW-GRADE FIBROMYXOID SARCOMA (LGFMS) IN A YOUNG MALE.

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Keywords: *low-grade fibromyxoid sarcoma, thoracic wall*

INTRODUCTION

Low-grade fibromyxoid sarcoma (LGFMS) is a rare tumor first described by Evans in 1987 and known as Evans Tumor as well. It is characterized by indolent nature but not without the risk of metastases and recurrence, in most cases occurring during the first two years post-operatively.

MATERIALS AND METHODS

We report a case of a young adult evacuated from Guinea-Bissau with a huge mass of anterior chest wall developing during almost a decade.

RESULTS

An 18-year-old male without relevant medical history or current medication was evacuated from Guinea Bissau due to a diagnosis of a giant mass on the anterior wall of the thorax, with 9 years of evolution and a progressive growth.

Chest CT scan described a bulky mass on the anterior surface of the chest, measuring approximately 17x17x12cm, heterogeneous with multiple images of calcifications originating from the body of the sternum at the level of the 3rd intercostal space, showing lysis with sclerosis in the body of the sternum, suggesting a chondroma as the first diagnostic hypothesis.

The patient was hospitalized in the Thoracic Surgery Department, having performed incisional biopsies whose morphological aspects and IHC profile favored this being a low-grade fibromyxoid sarcoma.

With a proposal for mass resection with sternotomy, prosthesis reconstruction and reconstruction in collaboration with Plastic Surgery, he was electively admitted for surgical intervention.

A resection of the mass, sternum and costal arches with partial resection of the pericardium to secure the surgical margin was performed. Subsequently the pericardium GoreTex patch was used and the sternum and costal arch 3D-printed Starpore prosthesis was placed. Then the latissimus dorsi pedicled muscle flap with skin was implanted over the sternum.

The surgery ran uneventfully and the patient was admitted to the ICU for the post-operative recovery.

CONCLUSION

The LGFMS tumors are rare masses for which the first-line treatment is a surgical resection (R0). They are prone to recur especially during the first two years so a close follow-up is recommended.

SOLITARY FIBROUS TUMORS OF THE PLEURA: A SINGLE CENTER EXPERIENCE

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Keywords: *Solitary fibrous tumors of the pleura*

INTRODUCTION

Solitary fibrous tumors of the pleura (SFTPs) are localized tumors of the pleura with a mesenchymal origin, accounting for less than 5% of all pleural tumors. Symptoms are usually nonspecific. The mainstay of therapy is a complete surgical resection (R0). The majority of SFTPs are indolent, having a recurrence rate of 10-25% at 10 years.

OBJECTIVES

This study was designed to retrospectively analyze all operated patients with SFTPs in our center since 2011.

MATERIALS AND METHODS

Retrospective study including all patients submitted to surgery with the diagnosis of SFTPs from 2011 to September 2021. Patient files were revised and their demographic characteristics, clinical aspects, type of surgery, surgical approach and respective outcomes were assessed.

RESULTS

18 patients were identified, 12 women and 6 men. The mean age was 63 years old±15,4 (range 28-83).Most patients were asymptomatic (N=11). The most common symptoms were fatigue (n=2) and cough (n=2); followed by weight loss (n=1), chills (n=1) and palpitations (n=1). 3 patients presented with refractory hypoglycemia (Doege-Potter Syndrome) and 2 with digital clubbing. 12 patients had a pre-operative histologic diagnosis by transthoracic needle biopsy.

17 patients were submitted to tumor resection with lung wedge resection and 1 patient underwent a right lower lobectomy due to the large contact surface with the tumor. Surgical approach was thoracotomy in most of the cases (n=12) and all of these patients had tumors larger than 6cm. 6 patients underwent a video assisted thoracic surgery (VATS). Complete resection was achieved in all cases but one. 3 of the excised SFTPs were considered malignant on pathology evaluation.

There were no perioperative complications. 30-day mortality was 0%.

Tumor greatest diameter ranged from 1.2cm to 30cm. All tumours presented extrapulmonary growth, arised from the visceral pleura. The heaviest tumor weighed 2790gr.

There were 5 recurrences, 3 of them from originally described benign tumors. Recurrence intervals ranged from 5 to 108 months (mean follow up time of 63 months).

The 5-year survival rate was 88,9%.

CONCLUSION

STFP is a rare entity. Complete surgical excision is the most important step to achieve long survival. Surgical approach varies due to variability of disease presentation, and some may be challenging due to the large tumor dimension, nevertheless surgical morbidity/mortality is low. Recurrence is not seldom so follow up of this entity is advised and should be addressed in a multidisciplinary setting.

LOWER CHEST PAIN

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Keywords: *chest pain, ribs, Tietze*

INTRODUCTION

Tietze syndrome is an atypical cause of anterior chest pain characterized by painful, swollen, non-pustular mass without redness or erythema, most often associated with the cartilage of ribs two or three, unilaterally. Most patients experience complete remission within weeks to months with conservative treatment.

OBJECTIVES

The goal of this work is to provide essential information for an unfamiliar pathology and clinic presentation and share our experience, for better understanding and optimizing patient care.

MATERIALS AND METHODS

We report a particularly rare case of Tietze syndrome, due to its location and recurrence.

RESULTS

A 52-years-old male, with personal history of angioplasty for multivessel coronary disease, dyslipidemia, hypertension, type II diabetes and polyarthralgia, was referred to our department due to lower chest pain (sharp and stabbing) on the right quadrant, localized, with worsening with torso flexion, and no history of trauma. On physical examination, it was identified a swollen limited area of 7 cm, on the anterior axillary line, on the right lower chest, painful to palpation. Chest computerized tomography revealed a hypertrophy of the right 11th rib cartilage, suggesting Tietze syndrome. After prolonged symptomatic conservative therapy, the patient underwent surgical excision of this cartilage. Pathology revealed mature cartilaginous tissue, with increased number of chondrocytes, without cell atypia, compatible with Tietze syndrome. After immediate post-operative period, pain was in remission and the patient was discharged asymptomatic.

Four months after, the patient returns to our department with similar recurring symptoms, 2 cm under the surgical wound, at the level of the 12th rib. After 9 months of ineffective symptomatic treatment, the costal cartilage of the 12th rib was surgically excised, as well, with pain remission.

This case is of particular interest because it is an unusual case of Tietze Syndrome, a rare condition by itself, that usually occurs at the level of 2nd and 3rd ribs and does not recur. Moreover, due to the younger population in which it tends to occur, patients are usually otherwise healthy. However, this patient had ischemic heart disease, which made the diagnosis more challenging.

CONCLUSION

Tietze syndrome is a benign self-limited condition and a diagnosis of exclusion. Pathologies to rule out include acute coronary syndrome, hypertensive crisis, infections/inflammation of the lungs and pleura, malignancies, trauma, arthritis, among others. It is also commonly misdiagnosed as costochondritis.

Despite its rarity, practitioners should be aware of the clinical presentation, complete a workup for acute life-threatening disorders and consider surgical treatment in medical management refractory cases.

PREOPERATIVE VARIABLES FOR PREDICTING PROLONGED AIR LEAK AFTER PULMONARY RESECTION

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Keywords: *Prolonged air leak, Preoperative variables, Video-assisted thoracic surgery*

INTRODUCTION

Postoperative air leak is the most frequent adverse event observed after major lung resection. Prolonged air leak (PAL) is defined by the Society of Thoracic Surgeons (STS) General Thoracic Surgery Database (GTSD) as an air leak persisting longer than 5 days postoperatively and it may affect from 15% to 25% of patients who undergo pulmonary resections. A variety of studies have tried to identify patients at high risk of developing PAL using preoperative variables. Generally, patients with PAL are more likely to be older, male and smokers. Furthermore, when focused on preoperative pulmonary function testing, the ratio of forced expiratory volume in 1 second (FEV1)/forced vital capacity (FVC) and diffuse capacity of carbon monoxide (DLCO) are considered independent risk factors for predicting PAL. Predicting the risk of PAL therefore may assist in adopting prophylactic or therapeutic measures aimed at reducing the occurrence of this complication.

OBJECTIVES

To identify predictors of prolonged postoperative air leak after pulmonary resection.

MATERIALS AND METHODS

From June 1, 2019 to May 31, 2020 108 consecutive uniportal VATS lobectomies were performed in our center. Preoperative variables were analyzed within "prolonged air leak" group and "standard outcome" group. The numeric variables were compared by using unpaired Student´s t-test or MannWhitney test, as appropriate. Categorical variables were compared by using Qui-squared test or Fisher´s exact test as appropriate. Variables were also used in univariate logistic regression analysis as independent predictors of air leak status.

RESULTS

The study population (108 patients) comprised 70 men and 38 women. Mean age at surgery was 64 years (range 28-79). Prolonged air leak was found in 33 patients. PAL was significantly more frequent in patients with lower DLCO.VA ($p=0.024$) and in those with previous history of pulmonary infections ($p<0.001$). All others variables analyzed, namely, age, sex, operative time, side of the operation, lobe resected, malignant pathology and preoperative values of pulmonary function tests (FEV1; FVC and FEV1/FVC), did not show significant difference between groups. Logistic regression analysis did not find any significant risk factor for PAL in our group.

CONCLUSION

Over the last years, several scoring systems have been developed to predict PAL, most of them identifying older age, male sex and worst preoperative pulmonary function tests as risk factors for this complication. In our court, however, only DLCO and previous history of pulmonary infections have been correlated to this complication.

ASTHMA'S DOPPELGANGER: A CLINICAL CASE OF DIFFUSE IDIOPATHIC PULMONARY NEUROENDOCRINE CELL HYPERPLASIA (DIPNECH)

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Keywords: *Carcinoid, Neuroendocrine, DIPNECH, Cancer*

INTRODUCTION

Diffuse Idiopathic Pulmonary Neuroendocrine Cell Hyperplasia (DIPNECH) is an underrecognized entity, defined as a proliferation of at least 5 neuroendocrine cells confined to the bronchial mucosa in at least 3 bronchioles in combination with at least 3 tumorlets and/or carcinoids.

OBJECTIVES

The Maine goal of this report is to describe a clinical entity that is often underdiagnosed and that represents a premalignant lesion.

MATERIALS AND METHODS

A clinical case of a patient that underwent surgery at our center is described. All data were collected from the patient's medical record.

RESULTS

We describe the case of a 61 year old woman, with no history of smoke exposure, former factory sewer, who was referred to her pulmonologist with complaints of chronic cough and wheezing with a two month evolution. Giventhe potential differential diagnosis between asthma and iinterstitial lung disease, the patient was prescribed with a combined inhaler and was performed a thoracic CT scan and a pletismography.

On her CT scan, three major nodules were found, two of them on the lower right lobe (with maximum diameters of 7,8mm and 11.5mm each) and one on the lower left lobe, measuring 16mm in diameter. On her pletismography she presented a slight obstructive ventilation defect that did not respond to inhaled bronchodilators. A transthoracic needle biopsy was performed on the two largest lesions, revealing evidence of two lung carcinoids on histological analysis, although PET-DOTA-NOC did not show significant metabolicalintake.

The clinical case was presented to the Thoracic surgery department and the patient was submitted to bilateral VATS for lower right and left lobe lobectomies. The post-operative course was uneventful. On histological analysis, besides the identification of three nodular lesions on the lower right lobe that corresponded to typical lung carcinoids and a fourth typical carcinoid on the left lower lobe, throughout the parenchyma there was neuroendocrine cell hyperplasia and scattered small tumorlets, consistent with a diagnosis of DIPNECH.

Two years after the diagnosis, the follow up CT scan reveals small 4mm lung nodules bilaterally on the upper lobes that have remained stable and the patient's symptoms have lessened after adequate corticosteroid and bronchodilator treatment.

CONCLUSION

DIPNECH is a rare disorder and can easily be misdiagnosed given its non-specific clinical presentation, but follow up is crucial. Being considered a premalignant lesion, all patients with a presumptive diagnosis of DIPNECH, in which we include our own, should be closely monitored, both clinically and radiologically.

ANATOMICAL RESECTION BY VIDEO-ASSISTED THORACIC SURGERY – OUR CENTRE´S EXPERIENCE

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Keywords: *VATS, Lung Cancer*

INTRODUCTION

Video-assisted thoracic surgery (VATS) is associated with fewer complications and shorter length of hospital stay compared with thoracotomy.

OBJECTIVES

Our goal was to appraise the surgical outcomes in patients with histological diagnosis of lung cancer submitted to anatomical resection by VATS at the department of Cardiothoracic Surgery of Centro Hospitalar Universitário de São João between June 2017 and July 2021.

MATERIALS AND METHODS

Descriptive analysis was performed. Specific group analyses were conducted using Mann-Whitney, Chi-square and Pearson correlation coefficient. Results were considered statistically significant if $p < 0,05$.

RESULTS

We included 236 patients. The majority were male and their median age was 67 years (37-86years). A significant number of patients had a history of smoking (34% were ex-smokers and 31% were active smokers). The majority of patients had cardiovascular risk factors (CRF) and median forced expiratory volume in 1 second (FEV1) prior to surgery was 94% (46%-147%). Waiting time for surgery was defined as the difference between surgery date and date of histological diagnosis and the median value was 82 days.

93,6 % of the patients were submitted to a lobectomy and adenocarcinoma was the predominant histology type. Uniportal VATS was performed in 42,8% of all the procedures.

Median of length of drainage (LOD) was 4 days (2-43 days) and median of length of stay (LOS) was 4 days (2-64ays).

The rate of complications in the postoperative period was 27,2 % and persistent air leak (PAL) was the most frequent complication. Conversion rate to thoracotomy was 7.2%.

There was no statistically significant difference in LOS between uniportal versus multiport VATS ($p=0,836$). Patients with CRF ($p= 0,008$) or complications in the postoperative period ($p<0,001$) had a higher LOS (statistically significant difference). There was a trend for active smoker to have a higher LOS ($p = 0.05$) and it is associated with the presence of PAL ($p=0,004$). There was a strong and positive correlation between the LOD and LOS ($r= 0,889$; $p<0.001$). There was a weak and negative correlation between the LOS and FEV1 prior to surgery ($r= -0,242$; $p <0.001$).

CONCLUSION

These results have implications for daily clinical practice since they reaffirmed that ours results are similar to international centers (conversion rate and LOS) and make us be more alert about waiting time for surgery, complications in the postoperative period and preoperative assessment (particularly FEV1 and smoke cessation). VATS is safe and we have very satisfactory results in our center.

VIDEO-ASSISTED THORACIC SURGERY IN LUNG CANCER ANATOMICAL RESECTION IN TWO HOSPITALS IN NORTHERN PORTUGAL

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Keywords: *VATS, Lung Cancer*

INTRODUCTION

Minimally invasive techniques, like video-assisted thoracic surgery (VATS) has become widely accepted for treatment of lung cancer offering to patients several advantages over traditional open thoracotomy.

OBJECTIVES

Our goal was to appraise the surgical outcomes in patients with histological diagnosis of lung cancer submitted to anatomical resection by VATS at the department of Cardiothoracic Surgery of two hospitals in Northern Portugal. Metastatic disease and benign lesions were excluded.

MATERIALS AND METHODS

Descriptive analysis was performed. Specific group analyses were conducted using Mann-Whitney and Chi-square test. Results were considered statistically significant if $p < 0,05$.

RESULTS

We included 684 patients, 448 from Centro Hospitalar de Vila Nova de Gaia/Espinho (CHVNG/E) and 236 from Centro Hospitalar Universitário de São João (CHUSJ). The majority (58%) were male and their median age was 66 years (19-86years).

Lobectomy was the main (93,7%) surgical procedure and the most common lobectomy was a right upper lobe lobectomy (31,9%). The remaining thoracic surgery were bilobectomy (3.9%), segmentectomy (1.0%) bronchial sleeve resection (0.9%) and pneumectomy (0.4%).

Uniportal VATS was performed in 79,5% of all the procedures. Conversion rate to thoracotomy was 8,8%.

The median of length of stay (LOS) was 5 days (2-64ays). The rate of complications in the postoperative period was 26,8 % and persistent air leak (PAL) was the most frequent complication.

Adenocarcinoma was the main histology type (75,6%). According to the 8th lung cancer TNM classification, pathological stage IA (44,2%) and IB (31,8%) were the most frequent in our study.

Patients with complications in the postoperative period ($p<0,001$) and patients who were converted to thoracotomy ($p=0,011$) had a higher LOS (statistically significant difference). There was no statistically significant difference in LOS between uniportal versus multiport VATS ($p=0,227$).

The patients who were converted to thoracotomy did not have a statistically significant higher rate of postoperative complications ($p=0,228$).

CONCLUSION

This study shows some results of the VATS programs that were implemented in two hospitals in Northern Portugal. Despite the good results, it also makes us more alert to postoperative complications. VATS is now the standard approach for the majority of patients with lung cancer submitted to anatomical resection in the North of Portugal.

PRIMARY SPONTANEOUS PNEUMOTHORAX: SURGICAL TREATMENT EXPERIENCE OF A CARDIOTHORACIC CENTER

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Keywords: *Pneumothorax, VATS, Thoracotomy*

INTRODUCTION

Primary spontaneous pneumothorax (PSP) is not a rare finding, and it is most frequent in young adults. It has a high recurrence rate, for which surgery is the best line of treatment. With the development of minimal invasive techniques surgical treatment is safer, with reduced length of in-hospital stay and minimal complications, while maintaining good treatment outcomes.

OBJECTIVES

Characterize patients with PSP who underwent surgical treatment.

MATERIALS AND METHODS

Retrospective analyses of patients with PSP who underwent surgery at the thoracic surgery department of C.H.U.C., from January 2017 to December 2019. Statistical analysis was performed with SPSS.

RESULTS

A total of 119 patients underwent surgery. Mean age was 28 (10) years and 84,0% were male. Sixty eight percent had smoking habits and most PSP were right-sided (58,8%). The main surgery indications were: first episode with persistent air leak (n=31 – 26,1%), recurrent ipsilateral pneumothorax (n=64 – 53,8%) and recurrent contralateral pneumothorax (n=24 – 20,2%).

Videothoracoscopy (VATS) was the most used approach (78,2%). The surgical techniques included pleural abrasion (99,2%), chemical pleurodesis with povidone-iodine (92,4%) and bleb excision (74,8%).

Surgical treatment was effective in most cases with recurrence in 5,0% (2 with percutaneous drainage and 4 requiring another surgery). Rate of complications was 14,3% being prolonged air leak the most common (n=6 – 5,0%). No postoperatory death was registered. Mean hospital length stay was 4 days.

There was no statistic difference between surgical approach and the recurrence rate (thoracotomy (n=23) 11,5% versus VATS (n=92) 3,2%; p =0,089). There was statistic difference between complications and surgical approach, favoring VATS (8,6%) vs thoracotomy (26,9%) (p=0,013). Mean in-hospital stay by surgical approach was 4 days (VATS) and 5 days (thoracotomy), with statistical significance (p=0,024).

CONCLUSION

Surgery is an efficient treatment for PSP, reducing rate of recurrence with minimal complications rate. VATS should be the gold-standard approach since it reaches good results with reduced in-hospital stay and rare complications.

SURGICALLY RESECTED LUNG CARCINOID TUMORS: A SINGLE INSTITUTION EXPERIENCE

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Keywords: *Carcinoid tumor; Lung cancer; Lung resection*

INTRODUCTION

Primary carcinoid tumors of the lung are rare neuroendocrine neoplasms with indolent behavior. They are generally classified into two distinct categories: typical carcinoids (TC) and atypical carcinoids (AC), based on histological features. Surgical resection is the recommended treatment.

OBJECTIVES

The purpose of this retrospective study was to describe clinicopathological features and outcomes in patients with surgically resected lung carcinoid tumors at our institution.

MATERIALS AND METHODS

We retrospectively reviewed all patients with a final histological diagnosis of a pulmonary carcinoid tumor who underwent surgery from January 2010 to January 2016. Data collected included demographics, clinical presentation, tumor location, pathology, treatment, morbidity, tumor recurrence and survival. The tumor stage was determined according to the 8th TNM staging system of lung cancer.

RESULTS

In this study 80 patients were included – 39 males and 41 females – with a mean age at diagnosis of 58.0 years (range 22-84). There were 73 (91.2%) cases of TC (37 males, 36 females; mean age 59.1) and 7 (8.8%) cases of AC patients (2 males, 5 females; mean age 46.7). 55 patients (68,8%) had clinical symptoms at initial presentation. TC and AC groups had similar clinicopathological characteristics. Histologic staging showed 61 patients in stage I, 10 in stage II, 6 in stage III and 2 in stage IV. Type of resection and radical lymph node dissection had no significant prognostic difference.

No statistically significant difference was found in either 5-year overall survival or 5-year disease-free survival between TC and AC groups. 5-year overall survival for the entire group was 96.3% (95.9% for TC and 100% for AC) and 5-year disease-free survival after surgery was 95.8%.

Symptoms at presentation (p=0,008), centrally located tumors (p=0,006) and synaptophysin immunohistochemical marker (p=0,037) were significantly associated with 5-year mortality.

CONCLUSION

Our study showed that surgery for lung carcinoid tumors allows excellent oncological results and overall long-term survival with a low postoperative complication rate. This series supports lung sparing resection techniques as adequate treatment for typical carcinoid tumors in selected cases. To the authors knowledge this study represents the largest national series of carcinoid lung tumors, however given the indolent nature of these neoplasms, longer follow-up periods might be necessary to determine predictive factors for recurrence and survival rates.

SURGERY FOR MALIGNANT PLEURAL MESOTHELIOMA – 10 YEARS OF A PORTUGUESE THORACIC DEPARTMENT

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Keywords: *Malignant pleural mesothelioma, Extrapleural pneumonectomy, Extended pleurectomy/decortication*

INTRODUCTION

Despite investigation and progress in the management of this rare tumor, malignant pleural mesothelioma (MPM) is a challenging disease with poor prognosis. The objective of oncologic surgery in MPM is a macroscopic complete resection however the optimal treatment is still under discussion. The diagnosis of MPM can be delayed by non-specific and insidious symptoms. A crucial step in the investigation of this patients is an accurate diagnosis of the histologic subtype and the pretreatment staging.

MATERIALS AND METHODS

We retrospectively reviewed our database with characteristics and perioperative course of patients with surgical treatment for MPM, in our department, from January 2010 until December 2020.

RESULTS

Sixteen patients, with a mean age of 63,8 years were submitted to surgical treatment for MPM. The majority were men (87,5%) and 9 (56,25%) had history of asbestos exposure. The surgical biopsy was required in 9 patients (4 by open pleural biopsy and video-assisted in 5). The epithelioid subtype was the predominant histology founded (87,5%) and 2 were biphasic. Talc pleurodesis was performed before surgical treatment in 8 patients and 9 (56,25%) received neoadjuvant chemotherapy. About surgical intervention: 10 patients were submitted to extrapleural pneumonectomy, 3 to extended pleurectomy/decortication and 3 to pleurectomy/decortication. 2 patients required surgical re-intervention for complications. The most frequent pathologic stage was IB (pT2-3N0). The mean hospital stay was 31 days. There was no mortality in the first 30 postoperative days. After one year, 8 patients were alive, 5 survived more than 24 months and 3 patients more than 36 months.

CONCLUSION

Asbestos are a well-known aetiological agent of MPM. Similar to other industrialized countries, Portugal widely used asbestos and the exposure of our population is considerable. Surgery plays different roles in the diagnosis, treatment and palliative care of MPM. Clinical outcome depends on a multidisciplinary discussion and multimodal treatment allocation in experienced centers. Surgical treatment may be appropriate for highly selected patients. The small number and heterogeneous sample required caution interpreting our results but it is not despicable that 31% patients survived more than 24 months after surgical treatment.

SUPPLEMENT

ABSTRACTS OF THE SPCCTV 4D VISIONS 2021

VISIONS 21

VASCULAR SURGERY

SHORT-TERM OUTCOMES IN PATIENTS SUBMITTED TO SELECTIVE SHUNT DURING CAROTID ENDARTERECTOMY UNDER REGIONAL ANESTHESIA: A PROPENSITY SCORE MATCHING ANALYSIS

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Keywords: *carotid endarterectomy, regional anesthesia*

INTRODUCTION

Implied carotid cross clamping during carotid endarterectomy (CEA) has been associated to intraoperative neurologic deficits (IND) with further stroke or death. If IND are detected, carotid shunting is broadly recommended to reduce the risk of stroke. However, shunting itself might present another risk of neurologic events, and subsequently presenting a challenge to be addressed. Current evidence is still questionable regarding its clear benefit.

OBJECTIVES

The aim of this study is to determine whether a policy of selective or non-shunting increases the complication rate following carotid endarterectomy.

MATERIALS AND METHODS

From January 2012 to May 2021, all patients undergoing CEA under regional anesthesia (RA) who presented a positive awake test were retrieved from a prospective database. Patients submitted to the selective shunt approach were compared to the non-shunt group. A propensity score matching (PSM) was performed. Differences between the groups were calculated and clinical outcomes were determined for each group, resorting to univariate and multivariable analysis.

RESULTS

Ninety eight patients were selected, from which 23 were subjected to shunting. After PSM, 22 non-shunt patients were compared to 22 shunting patients. Concerning demographics and comorbidities, both groups were comparable pre- and after PSM, except for chronic heart failure which was more prevalent in shunted patients (26.1%, P=0.036) in pre-PSM analysis. Regarding 30-day stroke and Clavien-Dindo $\geq$ 2, no statistically significant associations were found between the groups (P= 0.730, P= 0.635 and P= 0.942, P= 0.472, correspondingly, for pre- and after PSM).

CONCLUSION

In the present cohort study, resort to shunting did not demonstrate superior advantage in terms of 30-day stroke or a Clavien-Dindo $\geq$ 2. Nevertheless, additional studies with large cohorts and RCTs are mandatory to achieve clear results concerning the accurate utility of carotid shunting in patients submitted to CEA under RA.

MEAN PLATELET VOLUME PREDICTS RESTENOSIS AFTER CAROTID ENDARTERECTOMY

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Keywords: *Carotid endarterectomy, Mean Platelet Volume, Restenosis, Biomarkers, Haematology, Stroke*

INTRODUCTION

Carotid restenosis following carotid endarterectomy (CEA) has a cumulative risk at 5-years up to 32%, which may impact the well-being of patients following CEA. Haematological parameters in the standard complete blood cell count (CBC) are emerging as potential biomarkers, but their application in CEA is scarce.

OBJECTIVES

The primary aim of this study was to investigate haematological markers for restenosis following CEA. The secondary aim was to characterize clinical risk factors for restenosis.

MATERIALS AND METHODS

From January 2012 to January 2019, 151 patients who underwent CEA under regional anaesthesia due to carotid stenosis were selected from a prospectively maintained cohort database. Patients were included if a preoperative CBC was available in the two weeks preceding CEA. Multivariable analysis was performed alongside propensity score matching (PSM) analysis, using the preoperative CEA parameters, to reduce confounding factors between categories.

RESULTS

The study group comprised 28 patients who developed carotid restenosis. The remaining 123 patients without restenosis composed the control group. Mean age of the patients did not differ significantly between groups (70.25±8.05 vs. 70.32 ± 9.61 YO, p=0.973), neither did gender (male gender 89.3% vs. 78.9%, p=0.206). Regarding haematological parameters, only MPV remained statistically significant within multivariable analysis (1.855, aOR [1.174-2.931], p=0.008), a result supported by PSM analysis (2.072, aOR [1.036-4.147], p=0.042).

CONCLUSION

MPV was able to predict restenosis two years after CEA. Thus, MPV can be incorporated into score calculations to identify patients at greater risk of restenosis, who could benefit from specific monitoring during follow-up. While results are promising, more research is necessary to corroborate them.

UNCOMMON PRESENTATION OF PSEUDOANEURYSM OF THE ILIOFEMORAL TRANSITION

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Keywords: *Pseudoanerysm, mycotic aneurysm, deep vein thrombosis*

INTRODUCTION

Pseudoaneurysms are caused by an arterial wall defect, forming a sac contained by surrounding structures, rather than the 3 layers of the arterial wall.

Pseudoaneurysms are aetiologically classified as iatrogenic, traumatic, anastomotic, or infected.

Most common cause is iatrogenic. Less frequently: anastomotic leakages, non-iatrogenic trauma, and infection.

OBJECTIVES

We present a case of a case of a mycotic pseudoaneurysm (MPA) of the iliofemoral transition diagnosed during the evaluation of a deep vein thrombosis (DVT).

MATERIALS AND METHODS

73-YO male was admitted to the ER with pain and oedema of the right lower limb. Three months prior, he had been submitted to a derivative colonostomy, and treated with chemotherapy for a colonic neoplasm. No other significant medical history.

He presented with a pulsatile, non-tender right groin mass and oedema of the ipsilateral leg. No other remarkable findings at physical examination.

Ultrasound revealed an iliofemoral artery transition pseudoaneurysm, compressing the femoral vein, resulting in a ipsilateral DVT. Angio-CT showed a 3cm pseudoaneurysm, associated with a vast hematoma.

Patient underwent ilio-femoral bypass with prosthetic graft and decompression of the hematoma. Blood cultures revealed the growth of Methicillin-sensitive Staphylococcus aureus and antibiotic therapy was started.

Patient was discharged maintaining antibiotic therapy with linezolid.

Three months after discharge, patient died due to complications related to neoplastic disease.

RESULTS

MPA's constitute up to 3% of all aneurysms. Predisposing conditions include malignancy, immunocompromised states, recent surgery, and intravenous drug use (IDVU). Microbiological diagnosis is crucial to guide management. Staphylococcus aureus is isolated as the causative pathogen in 28-45% of cases.

Management of MPA's is different from those resulting from iatrogenic or traumatic injury. There is no role for conservative therapy without removal of the infective focus. 4–8 weeks of antimicrobial therapy is advocated.

Development of DVT by the compressing pseudoaneurysm is rare and seldomly characterized complication. It's regarded as a need for a surgical approach, as endovascular therapy wouldn't be able to address the compressing effect on the vein.

CONCLUSION

The presence of MPA in a non-IVDU patient is a rare event. The combination of a DVT due to venous compression makes this case unique.

As advocated in other cases of infectious false aneurysms, antibiotic therapy remains an important cornerstone in the treatment of these patients, along with tissue debridement.

Endovascular therapy may be an option for patients with high surgical risk, however the presence compression of adjacent structures may imply surgery as the only viable option.

SPONTANEOUS ISOLATED COMMON HEPATIC ARTERY DISSECTION – CASE REPORT

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Keywords: *Splanchnic artery dissection, common hepatic artery*

INTRODUCTION

Splanchnic artery dissection not associated with abdominal aorta (AA) dissection is a rare medical condition.

An incidence of about 0.09% is reported in Literature, increasing over the years, due to improvement in imagining techniques, especially, computerized tomography (CT). The most affected artery is the superior mesenteric (SMA), followed by the celiac trunk (CA).

OBJECTIVES

We report a case of isolated spontaneous common hepatic artery (CHA) dissection.

MATERIALS AND METHODS

A 58-year-old woman, with prior medical history of dyslipidaemia and past social smoking, is admitted to our emergency room with sudden, intense, diffuse abdominal pain and nausea. Patient denied trauma, personal or family history of connective tissue disease.

Physical examination was unremarkable, despite tenderness in the right upper quadrant. Laboratory testing revealed abnormal liver function tests (LFT), compatible with cytolysis.

Angio-CT revealed a dissection of the common hepatic artery progressing towards right hepatic artery with partial lumen thrombosis. CA, SMA, renal arteries and AA were not involved.

Analgesia and fasting were instituted. After a multidisciplinary team meeting, anticoagulation with LMWH was started.

As soon as pain control was achieved and LFT normalised, patient was discharged home with warfarin (with an international normalized ratio target of 2-3).

Three months after discharge, patient remained asymptomatic without de novo LFT alterations. Angio-CT revealed preserved CHA patency, subtle CHA growth (9 to 12mm) and distal dissection progression into right and left hepatic arteries.

RESULTS

To our knowledge, there aren't any cases reporting CHA dissection without CA involvement. Therefore, treatment options and follow-up protocols were inferred from conclusions drawn relating SMA and CA dissection.

Even when discussing other splanchnic artery dissections studies are scarce, most of them retrospective with small sample number. Most recommend analgesia and bowel rest, if patient is symptomatic. However, regarding platelet antiaggregation and anticoagulation, there is no consensus as some authors suggest contradictory outcomes.

Most authors agree that invasive treatment with endovascular or surgical techniques should be reserved for patients that develop complications such as end-organ ischaemia, aneurysm formation or arterial rupture.

CONCLUSION

Although Literature evidence concerning isolated dissection of the splanchnic arteries is scarce, most studies suggest a relatively benign course with only few patients developing complications. The role of anticoagulation and platelet antiaggregation remains to the determined.

POST-EMBOLIZATION RUPTURE OF AN 18CM RENAL ANGIOMYOLIPOMA - A CASE REPORT

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Keywords: *angiomyolipoma, embolization, renal*

INTRODUCTION

Angiomyolipomas (AML) are rare benign tumors that contain fat, smooth muscle and abnormal blood vessels. Their main complication is retroperitoneal bleeding, which can be life-threatening. The larger the tumor the greater the risk. Treatment is indicated for asymptomatic lesions >4cm. Selective arterial embolization (SAE) is considered a safe and effective treatment which can be used to prevent complications of high-risk tumors, to contain acute hemorrhages and as a preoperative adjuvant to reduce bleeding during surgery.

OBJECTIVES

We present a case of post-embolization AML rupture, treated with an endovascular approach.

MATERIALS AND METHODS

Revision of clinical process and current literature.

RESULTS

A 39 years-old woman presented with an incidental 18cm left renal AML. She had no significant comorbidities and reported no symptoms. Computed tomography angiography (CTA) showed an exophytic lesion with an important fat component, originating from the upper left kidney (figure1). The lesion showed multiple, large tortuous vessels, with several aneurysms as large as 17mm. The patient underwent SEA. Angiogram after left renal artery catheterization showed a large hypervascular mass with multiple feeding vessels originating mainly from a posterior segmental renal artery (figure2). After selective catheterization of this vessel, embolization with 355-500-micron and 500-710-micron polyvinyl alcohol (PVA) particles (Bearing nsPVA®) was performed. Control angiogram showed significant reduction in vascularization. Immediately after operation the patient complained of severe left lumbar pain and became hypotensive. Emergent CTA showed a perirenal hematoma with signs of active bleeding, confirming AML rupture. The patient was taken to the operating room for emergent endovascular reintervention. Left renal angiogram showed rupture of one of the feeding vessels in the upper pole of the AML (figure3). The posterior segmental renal artery feeding most of the AML was selected and occluded with an 6mm Amplatzer™ Vascular Plug 4. A smaller segmental renal artery was also occluded with two MReye® Embolization Coils (3x4mm and 4x3mm). Final angiographic control showed no evidence of bleeding, no significant perfusion of the AML and perfusion of most of the renal parenchyma (figure4). In the post-operative period, the patient was admitted to ICU for monitoring. She remained stable and renal function showed no changes during hospitalization. Post-operative CTA showed major reduction in vascularization of the AML.

CONCLUSION

Although rare and only occasionally described in the literature, rupture of AML post-embolization is a serious and life-threatening complication that can require emergent nephrectomy. In our case rapid endovascular reintervention with occlusion of major feeding arteries allowed for hemorrhage control while preserving renal function.

DIFFERENTIAL DIAGNOSIS OF FEVER AFTER EVAR – CASE REPORT

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Keywords: *EVAR, Fever, Postimplantation syndrome, Procalcitonin*

INTRODUCTION

Endovascular aortic repair (EVAR) has become an alternative to open surgery for the treatment of abdominal aortic aneurysms (AAA). EVAR is currently the preferred method of treatment of AAA patients with suitable anatomic criteria. Endovascular repair is associated with lower perioperative mortality/morbidity when compared to open surgery. Common complications include those related with the endograft device as well as systemic complications. Device-related complications include endoleaks, endograft migration, limb kinking/stenosis and graft infection. Post-procedural systemic complications include end-organ ischemia, cerebrovascular and cardiovascular events and post-implantation syndrome.

Fever can occur after EVAR. There are several causes of fever reported in the literature, like endograft infection and Postimplantation syndrome.

OBJECTIVES

Differential diagnosis of fever after EVAR.

MATERIALS AND METHODS

We report a case of a 78-years-old men sent to your department with an asymptomatic AAA with 7cm in diameter. The patient underwent t-Branch EVAR successfully, without postoperative complications. Four days after the procedure the patient develop flu like symptoms. We interpreted this as a Postimplantation syndrome. On the other hand, he presented elevated Procalcitonin (PCT). Two days later blood cultures were positive to Enterobacter cloacae complex, and the patient started broad spectrum antibiotics.

RESULTS

The PCT, a stablished biomarker of bacterial infection, allowed us to distinguish it from a Postimplantation syndrome and avoid possible endograft colonization.

CONCLUSION

This clinical case highlights the challenges in prosthetic vascular graft infection (PVGI) diagnosis, where presentation can mitigate other common and less deadly causes of fever like Postimplantation syndrome.

We emphasise the importance of maintaining a high index of suspicion for fever after EVAR, pointing out that all diagnostic hypotheses should be considered. In this regard, PCT can be a very important biomarker, unmasking the "wolf in sheep's clothing".

ENDOVASCULAR TREATMENT OF AORTIC ANEURYSMS PROCEDURE IMPLEMENTATION: NURSING CHALLANGES

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Keywords: *nurse, vascular, challange, training, aortic arch aneurysms*

INTRODUCTION

The Operating Theatre Nurses team has the goal to give a quality perioperative care, minimizing the risks and promoting a safe surgical environment to the patients and the surgical team. In the last years it has been verifyed that the endovascular treatment of aortic aneurysms, has been the first approach method in our Unit, as long as the patient lies within the criteria for this technique. With the arise of this new surgical procedure still under development for the treatment of aortic arch aneurysms, the challenge urges for the Nurses team to implement this new procedure.

Thereby, it is imperious the constant training and development of specific skills on the Vascular Speciality.

OBJECTIVES

To implement on the vascular operating theatre the endovascular treatment of the aortic arch aneurysms and the respective nursing care, to promote a big confidence to the team, aiming excellency care and the patient safety.

MATERIALS AND METHODS

Initially we had a training session from the company that develops the new prosthesis. Afterwards, the acquired knowledge from that training was reported to the remaining nursing theatre team.

Considering the requirements and the specifications of the surgical treatment, we had to elaborate and set up a new operating room disposition plan, as well organize all the needed resources to promote a safe environment.

RESULTS

Following thoroughly the next steps: The team training, planning and management of resources, the implementation and the procedure presentation we contributed for a safe surgery a successful outcome, subject to improvements in the future.

CONCLUSION

The new procedure implementation was a challenge for all the nursing team, not only because of technical specifications but also regarding patient safety, demanding a solid management planning of the resources on the operating room.

STABILISE TECHNIQUE FOR TYPE B AORTIC DISSECTION: INITIAL EXPERIENCE

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Keywords: *aortic dissection, endovascular, STABILISE*

INTRODUCTION

Acute type B aortic dissection requires treatment in the presence of complications: rupture, rapid dilation, intractable pain, hypertension and malperfusion of organs or limbs. Endovascular techniques have emerged as alternatives to open surgery. The technique of Stent-Assisted Balloon-Induced Intimal Disruption and Relamination in Aortic Dissection Repair (STABILISE), aims to complete obliterate the false lumen (FL) through the re-expansion of the true lumen with a non-covered stent.

OBJECTIVES

This study aims to report the utilisation of the STABILISE technique in the treatment of complicated type B aortic dissection.

MATERIALS AND METHODS

We selected 5 consecutive patients with complicated type B aortic dissection that were submitted to TEVAR and STABILISE technique at Centre Hospitalier et Universitaire de Rennes.

RESULTS

From November 2019 to September 2021, 5 patients were operated on using the STABILISE technique to treat a complicated type B aortic dissection, of those 40% were male and average age at time of surgery was 58 ± 10.9 years.

Indication for surgery was abdominal malperfusion syndrome with acute kidney injury and persistent abdominal pain in 80% (n=4) and aortic dilation in 20% (n=1). One patient presented with limb ischemia and one patient had history of previous cardiac surgery. Preoperative creatinine levels were 217 ± 109.9 μmol/L.

All patients were submitted to TEVAR implantation + STABILISE technique, with radioscopy time of 19 ± 9.5 minutes and contrast volume administration of 112 ± 38.8 mL. One patient was also submitted to right common carotid artery stenting.

All patients presented with hypertension that was difficult to control in the postoperative period. There was a global recovery of renal function after the procedure (postoperative creatinine 117 ± 42.6 μmol/L). Computed tomography control after surgery demonstrated no endoleaks and no postoperative aortic complications.

CONCLUSION

STABILISE technique is a safe and feasible alternative for treatment of complicated type B aortic dissection.

AORTOESOPHAGEAL FISTULA: A RARE LIFE-THREATENING CONDITION

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Keywords: *Aortoesophageal fistula, Aortoenteric fistula, TEVAR*

INTRODUCTION

Aortoesophageal fistula (AEF) is a rare cause of massive gastrointestinal bleeding and potentially fatal disease. AEF are classified as primary (due to aneurysm, infection, cancer, vasculitis or foreign body) or secondary (related to vascular or esophageal surgeries). The cornerstone for diagnosis is de Angio-CT scan and the optimal management remains controversial. However, TEVAR has recently become more common as a less invasive option, but it has weak points such as infection, availability and cannot provide surgical debridement of infected tissues. We present a case of 49 years-old man with esophageal tumor that caused a primary AEF.

RESULTS

CLINICAL CASE

A 49 years-old man with squamous cell esophageal carcinoma (SCEC) at thoracic esophagus arrived at emergency with nausea, hematemesis, bloody drainage by percutaneous endoscopic gastrostomy and abdominal pain. The patient was selected for a clinical trial to treat his neoplastic condition because he had radiologic complete response, but an ulcerated lesion was observed at esophagogastroduodenoscpy (EGD). He presented with tachycardic, hypotensive, with a Glasgow of 15, hemoglobin (Hg) of 10.3g/dL and lactate of 1.0mmol/L. Fluid resuscitation was started but the patient clinical status worsened with hemodynamic instability, Glasgow of 3, Hg of 7.7g/dl and lactate of 3.1mmol/L. Blood transfusion and vasopressors were started and emergent EGD was performed. At EGD, a voluminous clot was seen in esophagus and a high-flow fistula was observed. During the EGD the patient had a cardiorespiratory arrest and cardiopulmonary resuscitation was needed for 12 minutes. The patient recovers and a Angio-CT scan was performed showing an AEF in relation to SCEC, 80mm distal to the left subclavian artery (LSA). An emergent endovascular exclusion of the AEF was planned. A thoracic aorta angiography was made and the LSA and AEF were marked. From a femoral access, a thoracic stent graft (28x117mm) (Valiant™ Thoracic Stent Graft System with the Captivia™ Delivery System) was deployed at the local of AEF to exclude it from circulation. The completion angiography demonstrated complete exclusion from the AEF. The patient regained hemodynamic stability and an esophageal metallic prosthesis was placed 4 days later. At 30 days after the event, the patient remains alive.

CONCLUSION

A high level of suspicion is needed to a fast diagnosis and intervention of AEF. In our patient, a multidisciplinary approach was needed to treat it. We also show the great importance of endovascular techniques to treat this life-threatening condition.

MULTIDISCIPLINARY APPROACH TO TAVR PATHWAY CHOICE

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INTRODUCTION

The transfemoral (TF) pathway has become the gold standard for transcatheter aortic valve replacement (TAVR) however, significant peripheral vascular disease are amongst anatomical challenges that render the iliofemoral pathway unfeasible. Approximately 15% of patients are ineligible to the TF approach.

OBJECTIVES

Alternative TAVR approaches offer the possibility of valve replacement in patients ineligible to the transfemoral route

MATERIALS AND METHODS

We present three cases of alternative TAVR approaches.

RESULTS

All patients had severe iliofemoral disease so that the TF approach was deemed inappropriate.

One patient was submitted to TAVR using the left common carotid artery (CCA) after establishing patency of both carotid and vertebral arteries using doppler ultrasound. Surgical approach of the left CCA was performed and cerebral perfusion was tested system after a 3-minute clamping of the left CCA. TAVR was performed using a Medtronic® Evolut R 34mm. No complications were registered during the procedure.

Two other patients were submitted to TAVR using a transaxillary approach. The decision of this pathway was due to calcified carotid artery origin that deemed the transcarotid approach unachievable. In one case, due to obesity, a surgical approach was made. TAVR was performed using a Medtronic® CoreValve evolut R 34mm and 26mm on the endovascular case. Closure devices were using in the percutaneous access and a balloon catheter was placed over the access entry site to secure haemostasis. No complications were registered during either procedures.

CONCLUSION

There are several alternatives to the transfemoral approach: although the first developed, the transapical pathway is associated with a higher risk of complications.

Multiple studies attest the safety of the transcarotid approach, when compared to transfemoral. A thorough study of the carotid arteries is necessary as patients with a greater than 50% stenosis have a higher risk of embolization. A head CTA may be considered to evaluate the circle of Willis patency to identify patients with the potential risk for cerebral hypoperfusion.

The percutaneous transaxillary access might become the main surgery-free alternative pathway, although further research is needed regarding its safety. Additional steps have to be made to assure a secure haemostasis after the procedure. Another important issue is the presence of a patent internal mammary artery graft being of the risk of its occlusion due to the sheath in the subclavian artery.

The optimal alternative access site for TAVR has not been elucidated yet, nonetheless, the transcarotid and transaxillary seem safe options with outcomes similar to those observed in transfemoral pathway.

CHRONICALLY OCCLUDED INFRAINGUINAL BYPASS RECOVERY - 2 SUCCESSFUL REPORTS

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Keywords: *bypass thrombosis, revascularization, critical limb ischemia*

INTRODUCTION

Bypass occlusion is an increasingly frequent cause of critical ischemia and entails a risk of limb loss greater than 50%. Although the moment from which the recovery of an occluded bypass becomes unfeasible is not defined, it is empirically known that the duration of the occlusion negatively influences the success of the intervention.

OBJECTIVES

This paper aims to present 2 clinical cases where late revascularization of occluded bypass was possible and successful.

MATERIALS AND METHODS

For this work, the clinical files of both patients were reviewed, including data on admissions, interventions, follow-up appointments and resorting to the emergency department.

RESULTS

Clinical Case 1

Male, 66 years old, with documented composite femoro-pedal bypass thrombosis (6mm epTFE prosthesis + inverted great saphenous vein). Develops symptoms of critical limb ischemia 3 months later. At this point, he underwent thrombectomy and interposition of a 6mm ePTFE segment in the thigh, followed by balloon angioplasty of the stenoses of the remaining great saphenous vein and the distal anastomosis. Evolution with posterior delimitation of distal hallux necrosis requiring transphalangeal amputation. Bypass remains permeable after 30 days with favorable healing of the amputation stump.

Clinical Case 2

Female, 62 years old with popliteal-pedal bypass with inverted great saphenous vein. Documented thrombosis with symptoms within 3 weeks of evolution. She underwent balloon angioplasty of the external iliac artery, femoropopliteal axis and bypass vein. Postoperative period complicated with a false aneurysm of the bypass vein requiring interposition with contralateral great saphenous vein segment. Bypass remains permeable at 3 months.

CONCLUSION

Despite the recognized poor prognosis in cases of critical ischemia due to prolonged bypass occlusion, the attempt to recover them should be an option to consider in selected patients with no therapeutic alternative.

CONGENITAL VENOUS MALFORMATION OF THE UPPER LIMB IN A 10 YEAR-OLD BOY: SUCCESSFUL FOAM SCLEROSIS GUIDED BY ULTRASOUND AND FLUOROSCOPY.

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Keywords: *Venous malformation, Foam sclerosis*

INTRODUCTION

Congenital vascular malformations — whose incidence is 1.5% in the general population — originate from defective embryogenesis of unknown etiology and grow proportionally to general body growth. They can be classified into five groups, according to the modified Hamburg classification, depending on their predominant component: arterial, venous, arteriovenous shunting, lymphatic, and combined (mostly hemolymphatic). Venous malformations are one of the most common forms of congenital vascular malformations, after lymphatic malformations, and can be further classified into extratruncular or truncular forms, depending on the stage of embryonic life when the developmental arrest has occurred: extratruncular malformations include a defect or arrest in the early development of the vascular system, while truncular malformations develop later in the embryo and affect arteries and veins. Venous malformations remain a difficult diagnostic and therapeutic challenge due to the wide range of clinical presentations, unpredictable clinical course, erratic response to the treatment with high recurrence/persistence rates, high morbidity following non-specific conventional treatment, and confusing terminology.

RESULTS

A ten years-old boy is followed-up at Angiology and Vascular Surgery outpatient clinic due to extratruncular infiltrative venous malformation, limited to the left shoulder and arm; otherwise healthy, he has no development arrest or other associated syndrome/malformation. Imagiologic study of the venous malformations with MRI and CT scans revealed muscular infiltration in these anatomic regions. Given the boy's age and occasional minor pain, a plan of surveillance with analgesic medication was established; however, recent progressive exacerbation of the pain requiring daily medication caused a significant burden over the child and his parents, prompting an invasive treatment to achieve symptoms control. Under general anaesthesia, a diagnostic transfemoral angiogram of the left upper limb was performed to exclude the arterial involvement in the malformation; during the same operative time, ultrasound-guided transcutaneous puncture of the biggest venous malformations was done and then treated with polidocanol foam (total of 8 mL liquid polidocanol at 2%) under fluoroscopic control to ensure intraluminal injection. Both intra and post-operative periods went uneventfully and the boy was discharged after 48 hours, with significant decrease in malformation volume and associated pain.

CONCLUSION

Simultaneous use of ultrasound and fluoroscopy combines the best these technologies have to offer to safely puncture and inject foam sclerosant; this technique increases the chances to achieve the best possible outcome in challenging venous malformations whilst decreasing the risk of thromboembolic complications.

MINIMALLY INVASIVE TREATMENT OF CONGENITAL ARTERIO-VENOUS MALFORMATION - CLINICAL REPORT

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Keywords: *Arterio-Venous Malformation, Selective embolization*

INTRODUCTION

Congenital vascular malformations are entities with a wide spectrum of presentations and variable prognosis, ranging from small skin lesions with only capillary involvement to large arteriovenous communications with compressive symptoms and hemodynamic impact. With an estimated global incidence of around 1%, it is difficult to calculate the true prevalence of the different variants, with the best approach being dependent on the understanding and characterization of each type of lesion.

OBJECTIVES

In this paper we present the clinical case of a child with an arteriovenous malformation of the thigh with continuous growth, submitted to selective embolization of the lesion's nidus.

MATERIALS AND METHODS

This paper reports the clinical evolution of a 6-year-old female referred to the Vascular Surgery department in 2018, for a large lesion on the left thigh suggestive of vascular malformation. The initial evaluation with doppler ultrasound confirmed the presence of arteriovenous shunting and the magnetic resonance angiography showed an infiltrative extratroncular arteriovenous malformation (AVM) depending on the deep femoral artery. During a 3-year follow-up, the lesion showed progressive growth, which motivated the choice for treatment.

RESULTS

We performed a selective embolization of the afferent vessels using a combination of 1% liquid polidocanol, microparticles and microcoils. The main afferents of the AVM were successfully embolized with practically complete and immediate resolution of the lesion. In the first postoperative evaluation at 20 days, an area of extensive cutaneous ulceration of the overlying tissues was found, with evolution to superficial necrosis. At 3 months, the lesion presents with a progressive reduction of the ulcerated area, with detachment of the necrotic plaque and underlying granulation tissue.

CONCLUSION

Vascular malformations are historically associated with aggressive surgical treatments, with great morbidity and unsatisfactory results. In the last century, with a better understanding of their etiology and pathophysiology and the development of new minimally invasive techniques, the treatment of these lesions seems to have more promising outcomes. In the case presented here, an almost complete exclusion of the arteriovenous malformation was achieved through selective embolization of the lesion, with a sustained favorable evolution at the 3-month follow-up. However, despite its short-term success, this condition requires close and long-term follow-up given the high risk of recurrence.

BUERGER'S DISEASE

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Keywords: *Buerger's Disease; Thromboangiitis obliterans; limb ischemia*

INTRODUCTION

Buerger's disease is a segmental nonatherosclerotic inflammatory condition that involves small and medium size arteries and veins of inferior and superior limbs. It's incidence is less than 6% in western Europe and affects mainly smoker males younger than 45 years old. It presents in most cases as a digital ischemic ulcer.

OBJECTIVES

To describe a clinical case and revise literature about Buerger's disease.

MATERIALS AND METHODS

A 45-year-old smoker male went repeatedly to emergency department for refractory pain and inflammatory signs in right halux in the last month, without response to antihyperuricemic drugs. Later he developped ulcers in the first and fifth fingers of right foot and Doppler ultrasonography revealed segmental occlusion of distal arteries of right inferior limb. These findings were also observed in arteriography along with "corkskrew" collaterals and normal proximal arteries. Autoimmune disease, thrombophilic disorder and other cardiovascular risk factors were excluded.

RESULTS

Analgesia and tight control of infectious processes were implemented. A course of vasodilators with alprostadil was performed. After several attempts, the patient definitively stopped smoking, with clear control of the underlying disease. After undergoing hallux amputation, he has remained without other manifestations of the disease. No revascularization surgery was necessary.

CONCLUSION

Buerger's disease is a diagnosis of exclusion and should be considered in young male smokers with evidence of peripherical artery disease, without other cardiovascular risk factors. Several sets of diagnostic criteria have been suggested including the classic ones by Shionoya. Smoking cessation is the most effective treatment and the only way to stop the progression of the disease. There are other alternative therapies whose effectiveness is dubious but which should be evaluated on a case-by-case basis.

MEDIAN ARCUATE LIGAMENT SYNDROME – CASE REPORT AND TREATMENT MODALITIES

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Keywords: *Median arcuate ligament syndrome, Arterial compression syndrome, Celiac artery stenting*

INTRODUCTION

Median arcuate ligament syndrome (MALS) comprises the clinical signs and symptoms consequent to celiac artery (CA) compression by the median arcuate ligament (MAL). The first successful surgical release of the CA was performed in 1963, however to this date MALS remains a controversy pathology. Up to 24% of the population may have anatomical MAL compression despite less than 1% of these patients being symptomatic. Several mechanisms have been proposed for MALS' symptoms, of relevance the vascular and neurogenic hypothesis, but the pathophysiology remains poorly understood. This complicates proper diagnosis as well as patient selection for optimal clinical outcomes.

OBJECTIVES

Present a MALS case report. Review diagnostic and treatment modalities.

MATERIALS AND METHODS

Electronic medical records review and non-systematic literature review.

RESULTS

We report a 77-year-old male with a previous medical history of arterial hypertension, non-insulin-dependent (type II) diabetes mellitus and a previous idiopathic acute pancreatitis.

In December 2020 the patient started complaints of epigastric pain, bloating, nausea, vomits – the majority of these were postprandial 15-20 minutes after meals, and weight loss (12% of total weight). Diagnostic workup was unremarkable (blood tests, endoscopic studies, functional motility studies and CT). The symptoms aggravated despite conservative treatment leading to multiple emergency admittances.

In April 2021, Vascular Surgery was initially contacted to evaluate a <30% stenosis of the superior mesenteric artery as a possible cause. However, a previously unreported extrinsic compression of the CA was noted, and given the absence of alternative diagnosis despite exhaustive testing, MALS was assumed. The diagnosis was also supported by doppler ultrasound revealing hemodynamic impact of the stenosis.

General Surgery intervened and performed a successful laparoscopic MAL release plus celiac ganglionic fibers division. Despite a slight improvement, the patient maintained symptoms and doppler ultrasound confirmed persistence of the stenosis. Using percutaneous transfemoral access, a primary balloon-expanded bare metal stent (7x29mm) was successfully deployed in the CA. In collaboration with nutritionists for adequate diets, the symptoms gradually improved and its weight improved 10% since the procedure.

CONCLUSION

MALS is a rare and poorly understood pathology leading to its underdiagnosis. Despite being a relatively common imagiological finding, an unreported MAL compression may lead to a delayed diagnosis. These patients suffer greatly from this disease which may have dire outcomes. Proper management and treatment should be swift in order to allow for optimal patient rehabilitation and involve a multidisciplinary approach.

A CASE REPORT OF THE FIRST USE OF SURFACER® INSIDE-OUT® ACCESS SYSTEM IN A PEDIATRIC PATIENT

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Keywords: *Central Venou*

INTRODUCTION

Long-term central venous catheters (CVC) can trigger the development of stenosis or even occlusions, at the level of the large thoracic and abdominal veins. The Surfacer system® is an alternative for patients in whom all possibilities of venous access have been exhausted, facilitating the access to large thoracic veins via the novel Inside-Out® approach, with excellent reported success rates.
To our knowledge, there are no reported cases of the use of this device in children.

OBJECTIVES

This study aims to describe the pioneering use of the Surfacer® Inside-Out® Access Catheter System in the pediatric age.

MATERIALS AND METHODS

The patient's electronic clinical record was reviewed for case presentation. Informed consent was obtained from the legally authorized representative for the use of clinical data and images of the procedure, preserving the anonymity of the patient.

RESULTS

A 7-year-old girl who had previously undergone chemotherapy treatment for B-Cell acute lymphoblastic leukemia achieving cure criteria. She presented evidence of medullar leukemia recurrence in May 2021. Right jugular temporary CVC was placed by interventional radiology, posteriorly removed for systemic candidemia (Candida albicans) with positive catheter tip cultures, and was treated with amphotericin B. It was impossible to obtain new central venous access through the jugular or subclavian veins bilaterally, having been documented bilateral total occlusion of the brachiocephalic veins and superior vena cava (SVC). Temporary CVC was placed in the right femoral vein. Considering the need for long-term chemotherapy, the patient was presented to the vascular surgery department to evaluate the possibility of surgically inserting a totally implantable CVC.

The right femoral temporary CVC was used as venous access for advancing a hydrophilic guidewire to the occlusion in the SVC over which an 8Fr sheath was advanced to the central vein occlusion. Using the Surfacer® system, central venous access was obtained up to the SVC with tunneling and implantation of a Broviac® 6.5Fr CVC in the right infraclavicular region without complications. The entire procedure was carried out with the support of cardiothoracic surgery, in case of open surgery was needed.

CONCLUSION

The Surfacer System offers a safe and effective approach to restoring central venous access in the upper body. Multicenter clinical studies have shown success rates of 90% to 97% in patients with central venous occlusions without device-related complications. Our case demonstrates that this device can also be used safely in the pediatric age.

LAPAROSCOPIC LIGATION OF INFERIOR MESENTERIC ARTERY FOR TREATMENT OF TYPE II ENDOLEAK AFTER EVAR - SINGLE-CENTER EXPERIENCE

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Keywords: *EVAR, type 2 endoleak, laparoscopy*

INTRODUCTION

Type II endoleak remains a regular complication after EVAR, as well as an important cause of re-intervention. While its impact on EVAR outcomes is still not well understood, several methods have been outlined for its treatment. We report our experience with laparoscopic IMA occlusion in the treatment of type II endoleak.

OBJECTIVES

We report our experience with laparoscopic IMA occlusion in the treatment of type II endoleak and review pre-operative and post-operative outcomes.

MATERIALS AND METHODS

A retrospective analysis of EVAR performed from January 2004 to December 2020 in our center was done to identify patients who underwent laparoscopic IMA occlusion due to type II endoleak. Their pre-operative and post-operative outcomes were reviewed.

RESULTS

From January 2004 to December 2020, four patients (1%), three male and one female, underwent IMA laparoscopic occlusion for type II endoleak after EVAR. Median age at time of intervention (especificar se EVAR ou IMA ligation) was 75 years (range 72-89). All four patients had medical history of arterial hypertension. Median AAA diameter at implant was 62mm (range 55-70), and no intra-operative endoleak was found. Time to intervention for IMA occlusion ranged from 18 months to 54 months (mean 37 months) from index EVAR. In two patients, aneurysm size had increased in relation to pre-implant measurements, and stable in the remaining two patient. There were no re-interventions nor deaths in the first 30 days. Median hospital stay was four days (range 2-19 days). In all patients, no identifiable AMI-related endoleak was reported in the post-operative CT-scan. Median follow-up was 17 months, with sac regression occurring in two patients. Late re-interventions after laparoscopic ligation of AMI were performed in two patients (50%).

CONCLUSION

Laparoscopic ligation of AMI may have a role in type II endoleak treatment in specialized centers, mainly in patients with renal insufficiency or previous unsuccessful endovascular intervention. In our limited experience, laparoscopic ligation of IMA presents with good outcomes in the resolution of IMA-related endoleak, with a low complication rate.

LATE OPEN SURGICAL CONVERSION OF EVAR - SINGLE CENTER EXPERIENCE

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Keywords: *EVAR, open surgical conversion, endoleak, infection*

INTRODUCTION

Endovascular aortic repair (EVAR) is currently widely used in the treatment of abdominal aortic aneurysms (AAA). Re-interventions after EVAR are often needed for complications such as endoleaks, limb occlusion and aneurysm rupture but, in most cases, these are amenable to endovascular techniques. Open surgical conversion (OSC) after EVAR is indicated when these are unsuitable for endovascular treatment, and when explantation is considered in graft infection.

OBJECTIVES

To report our center experience in open surgical conversion after EVAR.

MATERIALS AND METHODS

A retrospective analysis of EVAR performed from January 2004 to December 2020 in our center was done, and patients who underwent late open surgical conversion, meaning a transperitoneal or retroperitoneal approach for treatment of aneurysm or endograft related complications, performed at least 30 days after the initial endograft implantation, were identified.

RESULTS

From January 2004 to December 2020, four patients (1%) that underwent EVAR at our institution required late open surgical conversion. All four patients had arterial hypertension. Indication for initial EVAR implant was elective in three patients (75%), and urgent for a ruptured AAA in one patient (25%). Time to open surgical conversion ranged from four months to 66 months (mean 31 months). Mean diameter of AAA at OSC was 73mm (range 60-92mm). Open surgical conversion was performed electively in half of the patients, with the remaining half performed in an urgent setting for ruptured aneurysm. Indications for OSC included type II EL (n=1, 25%), rupture (n=2, 50%) and infection (n=1, 25%).

In the type II EL patient, prior unsuccessful endovascular re-interventions were performed. The surgical approach was transperitoneal in two patients (50%), and retroperitoneal in the remaining two patients. Two patients (50%) died intra-operatively, both in ruptured setting.

CONCLUSION

Open surgical conversion is still a needed alternative for treating complications after EVAR, despite advances in endograft development and in the endovascular treatment of these. Our center reported a rate of 1% of OSC, which is consistent with recent reports. OSC after EVAR is a rare procedure that poses many challenges and, while outcomes in the elective setting have been improving, non-elective cases still present with high mortality.

ILIO-RENAL BYPASS TO TREAT A TYPE 3 ENDOLEAK AFTER B-EVAR

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INTRODUCTION

Since the establishment of endovascular repair of aortic aneurysms, different types of endovascular grafts have been developed to treat various types of anatomies, including off-the-shelf grafts to treat complex thoracoabdominal aortic aneurysms (TAAA), especially in high-risk or symptomatic patients that can't wait for the design and manufacture of a custom-made branched or fenestrated graft.

OBJECTIVES

To report the initial treatment, evolution, complications and endoleak management of a patient with a Crawford type II TAAA

MATERIALS AND METHODS

In this case he was firstly treated with TEVAR + off-the-shelf branched endograft, and later developed three type III endoleaks, two of which were treated with bridge-stents, but technically was not possible to solve with endovascular approach only. The solution used was a hybrid repair with occlusion of the endograft's right renal branch and a surgical ilio-renal bypass.

RESULTS

The last surgery was done 18 months ago, and the bypass is still patent, with normal creatinine levels, and no endoleaks at 12 months CT-angio.

CONCLUSION

Sometimes the complications of the endovascular treatment of complex TAAAs cannot be solved by an endovascular-only method, being the open or hybrid surgery a good option in these cases.

WOUND, ISCHEMIA, FOOT INFECTION (WIFI) CLASSIFICATION PREDICTS AMPUTATION-FREE SURVIVAL IN A PORTUGUESE POPULATION: A SINGLE CENTER EXPERIENCE

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Keywords: *WIfI, Chronic Limb-Threatening Ischemia, Amputation-Free Survival*

INTRODUCTION

In chronic limb-threatening ischemia (CLTI) multiples factors contribute to the risk of limb loss, including degree of ischemia, infection and ulcer extent. Previous classifications, as Rutherford and Fontaine, lack detail and granularity to precisely stratify patients according to their risk of limb loss, mortality and expected benefit of revascularization. Diabetic foot ulcer classifications often neglect the grade of ischemia and consider it as a dichotomous variable. The Society for Vascular Surgery proposed an updated CLTI classification based on Wound, Ischemia, and foot Infection (WIfI).

OBJECTIVES

The aim of this study is to evaluate the prognostic value of WIfI classification in a Portuguese population.

MATERIALS AND METHODS

Single-center retrospective evaluation of prospectively collected data of CLTI patients from January to December of 2017. The inclusion criteria were all consecutive patients with CLTI with ischemic rest pain or tissue loss submitted to lower limb revascularization. Patients with intermittent claudication, acute ischemia, isolated iliac interventions, vascular trauma, and non-atherosclerotic arterial disease were excluded. The primary end-point was major limb amputation, mortality and amputation-free survival (AFS) at 30 days, 1 year and 2 year follow-up. Secondary end-points were minor amputation, wound healing time (WHT) and rate (WHR).

RESULTS

In the study period, 111 patients with CLTI were submitted to infra-inguinal revascularization: 91 (82%) endovascular and 20 (18%) open surgery. Average age was 71 years old and 64.3% were males. 20 (17.9%) had WIfI stage 1, 29 (25.9%) stage 2, 38 (33.9%) WIfI stage 3 and 21 (18.8%) WIfI stage 4. Mortality was 1.8%, 17% and 22.3% at 30 days, 1 year and 2 years follow-up. Major amputation was 0.9%, 2.7% and 2.7% at 30 days, 1 year and 2 years follow-up. Amputation free survival was 97.3%, 82.1%, and 76.8% at 30 days, 1 year, 2 years follow-up. Diabetics and women had higher proportion of WIfI stage 3 and stage 4. WIfI score was the only predictive factor for 30d, 1-year and 2-year mortality and amputation free-survival in multivariate analysis with logistic regression, adjusted for possible confounders (gender, diabetes mellitus, and endovascular or open surgery revascularization). WIfI 3 and 4 were also associated with increased risk of non-healing ulcer.

CONCLUSION

Higher WIfI score is associated with increased mortality, lower AFS and non-healing ulcer.

This study demonstrates the prognostic value of the WIfI classification in a Portuguese population.

CAPECITABINE RELATED LOWER-LIMB ARTERIAL THROMBOSIS - A CASE REPORT

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Keywords: *arterial thrombosis, chemotherapy, capecitabine*

INTRODUCTION

Thromboembolic events are a common complication of cancer and cancer treatment. Despite mainly involving the venous system, arterial thrombosis is also reported. Moreover, several chemotherapy drugs have been found to be prothrombotic.

OBJECTIVES

We report a case of acute lower limb ischemia due to arterial thrombosis in a young patient being treated for colon malignancy with adjuvant chemotherapy with capecitabine.

RESULTS

A 52-year-old female presented to the emergency department with acute limb ischemia of the right lower limb, with calf pain at rest and coldness of the foot and lower leg; she had no sensory nor motor deficits and popliteal and foot pulses were absent. A doppler ultrasound was performed in the emergency department, revealing an occlusion of the distal superficial femoral artery and proximal popliteal artery. In the absence of a likely embolic etiology, she was started on catheter-directed thrombolysis (CDT) through antegrade femoral access, completing a total of 72h of CDT, with progressive resolution of her complaints and no adverse events. Final angiogram showed a total recanalization of peroneal artery, residual thrombus in the tibioperoneal trunk and anterior tibial artery proximal occlusion. Post-CDT ankle-brachial index was 1 in both lower limbs.The patient was discharged on day 9 on oral anticoagulation with rivaroxaban. Oncology was consulted and oral capecitabine was suspended. After two months, the patient remains asymptomatic with palpable foot pulses on both lower limbs.

CONCLUSION

Arterial thrombosis in cancer patients, while less common than venous thromboembolism, presents with a significant degree of morbidity and mortality. As this population is usually younger and missing the usual risk factors for arterial thromboembolic events, a high degree of suspicion is needed in patients with active cancer presenting with de novo symptoms/signs of the extremities, moreover in patients under chemotherapy, especially with certain types of chemotherapy drugs.

A TEN YEAR PERIOD ANALYSIS OF POPLITEAL ARTERY ANEURYSM IN ONE CENTER

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Keywords: *popliteal artery aneurysm, endovascular, surgical*

INTRODUCTION

The endovascular treatment of Popliteal Artery Aneurysm (PAA) is becoming more and more popular, as it shortens the recovery time and the hospital stay. Recent studies report similar secondary patency rates compared to the surgical approach, making this approach an option in the treatment of this pathology.

OBJECTIVES

The present study aims to retrospectively analyze the treatment of PAA over a period of ten years. It tries to compare the reintervention and amputation rates in patients treated by classical surgery versus endovascular approach and also compare groups in terms of clinical signs and the conduit material used in the surgical approach. It intends to identify risk factors associated with increased rates of reintervention and/or amputation too.

MATERIALS AND METHODS

From 2010 to 2020, 97 patients data were used in this study, corresponding to 122 popliteal aneurysms via classical surgical treatment (n=118) and endovascular treatment (n=4). Post traumatic, inflammatory, family and anastomotic aneurysms were excluded. The results were treated using the SPSS program.

RESULTS

The patient mean age was 68 years with a 1:32 female/male ratio; 46% of patients presented bilateral aneurysms, 45% diagnosed with hypertension and 54% being active smokers at the time of treatment. There was no statistically significant difference between the results of classic and endovascular groups, due to an extremely short endovascular sample. The reintervention rate was 24.6%, being higher in the symptomatic group (30.8%) showing statistical significance ($p<0.05$). There was a statistically significant difference in the amputation rate per year (2.7% asymptomatic group VS 20.5% in the symptomatic group ($p<0.05$). The conduit material used in the surgical approach was a relevant factor in the rate of reintervention and amputation, impacting the observed patency rates.

CONCLUSION

Although one of the aims of the study was not achieved (comparing the endovascular approach with the surgical approach) it has been concluded that venous bypass surgery in asymptomatic patients is an effective approach with reduced reintervention and amputation rates. The same is not concluded in patients who present with clinical signs of ischemia and when PTFE conduit is used. There is currently an ongoing randomized multicentric study that seeks to compare the open surgery with endovascular treatment but only eligible for asymptomatic patients (OVERPAR trial). More studies are essential to try to understand whether the endovascular approach could be a viable and equally effective option specially in situations where the venous conduit is not available or when the patient presents with clinical signs of ischemia.

DONOR ARTERY ANEURYSM DEGENERATION AFTER ARTERIOVENOUS ACCESS FOR HEMODIALYSIS: A SYSTEMATIC REVIEW

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INTRODUCTION

True aneurysms of the upper extremity arteries are quite rare, usually associated with trauma or infection. Arterial aneurysmal degeneration could also occur proximally to arteriovenous hemodialysis access, a complication that has been reported more frequently.

OBJECTIVES

This study aims to clearly define the anatomical characteristics and natural history of true arterial aneurysms associated with hemodialysis arteriovenous access

MATERIALS AND METHODS

We performed a systematic review of the literature in the MedLine, Scopus, and Cochrane databases from 1991 to 2021. Cases of pseudoaneurysms and anastomotic aneurysms were excluded. A total of 47 articles referring to 98 patients were included. Demographic characteristics, particularities of vascular access, symptoms, treatment, and follow-up were analyzed.

RESULTS

Most patients included were male (85%) with a mean age of 51 years (range 20-77 years). The most frequently affected artery was the brachial artery in 87% of cases (n=86), with the axillary and radial arteries being less affected. The vascular accesses frequently associated were autologous radiocephalic arteriovenous fistulas in 57% (n=56) and brachycephalic fistulas in 39% (n=38). Most patients had a history of kidney transplantation (88%; n=86) and previous vascular access ligation or thrombosis (84%; n=82). The median time from access ligation to aneurysm diagnosis was 10 years (range 1-32 years) and the median time from kidney transplantation was 13 years (range 1-32 years).

Only 8% of patients (n=8) had a history of diabetes mellitus. Treatment was open surgery with interposition bypass or end-to-end reconstruction in most cases, and endovascular treatment was only reported in one patient to repair a ruptured axillary artery aneurysm. The median reported patency time was 12 months (range 1-72 months).

CONCLUSION

Aneurysmal degeneration of the inflow artery proximal to the hemodialysis vascular access must be understood as an individualized entity with specific characteristics. Aneurysm degeneration usually affects the brachial artery after kidney transplant and is associated with wrist fistulas after ligation of the vascular access. Although diabetes is a major cause of kidney disease, this group of patients are rarely affected.

Our review suggests that donor artery aneurysm degeneration screening with ultrasound should be considered 10 to 15 years after access ligation and kidney transplant.

ROLE OF ENDOVAC TECHNIQUE FOR INFECTED VASCULAR RECONSTRUCTIONS

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Keywords: *EndoVAC, Stent graft, Vascular graft infection, Negative pressure wound therapy*

INTRODUCTION

Vascular graft infections pose one of the most feared and challenging post-operative complications in vascular surgery, due to its high morbidity and mortality rates especially when associated with sepsis and major anastomotic bleeding. Conventional treatment includes total removal of the infected graft, followed by often complex and extra-anatomical, reconstruction of a new bypass in order to avoid the infected area. Due to either anatomic difficulties or patient comorbidities, open surgical repair is sometimes unfeasible.

EndoVAC uses a three step technique: relining of the infected graft with a stent graft, surgical revision without clamping and negative pressure wound therapy; posing as a new procedure for patients not eligible for open surgery.

OBJECTIVES

Review the published literature and the results on the application of the EndoVAC hybrid technique.

MATERIALS AND METHODS

Using PubMed, 4 articles were selected including 3 cases reports and one retrospective study, where the use of EndoVAC was analyzed.

RESULTS

Among the four studies a total of 40 cases are reported, 5 supra-aortic trunk graft infections, 9 carotid patch infections, 22 femoral artery reconstructions (patch or bypass infection) with groin infection, 4 vascular access related infections. Among these a total of 37 (92,5%) had complete wound healing, none of which had reinfections. During follow-up, 12 patients died, of which only two (5%) were attributed to graft infection. Other major complications reported by these articles related to the use of EndoVAC were: transient ischemic attack (2,5%), temporary hypoglossal palsy (5%), major bleeding (5%), major amputation (10%) and graft stent thrombosis (15%).

CONCLUSION

The EndoVAC hybrid approach seems like a promising technique for infected vascular grafts where conventional, open surgery is difficult or unfeasible due to patient or access related conditions with a high success healing rate of the infected wound site.

COMPARISON BETWEEN UPPER EXTREMITY AND FEMORAL ACCESS FOR F/BEVAR: A LITERATURE REVIEW

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Keywords: *EVAR, Aneurisma toracoabdominal, AVC, Acesso arterial*

INTRODUCTION

The technique for fenestrated or branched EVAR (f/bEVAR) usually relies on an upper extremity access (UEA) to ease an antegrade catheterization of the visceral arteries. However, maneuvering through the aortic arch is associated with cerebrovascular events. The recent development of exclusive transfemoral (TFA) techniques aims to reduce such risk.

OBJECTIVE

The aim of the present revision is to compare outcomes between UEA and TFA in f/bEVAR.

METHODS

Following PRISMA guidelines, PubMed and Embase databases were consulted, searching for publications written in English up to 2021. All articles demonstrating data on local or remote outcomes of UEA and TFA in f/bEVAR were included.

RESULTS

Nine articles were deemed suitable for inclusion, 8 of which described unicentric retrospective studies. No randomized controlled trial or meta-analyses were found.

The majority of the population was male, with a median age of 72 years. The most frequent indication for f/bEVAR was thoracoabdominal aneurysm. Around 80% of the procedures used UEA while only 20% relied exclusively in TFA.

The rate of complications using UEA was 8%, most often in percutaneous techniques, and a rate of up to 8% of ischemic stroke was reported. No strokes were reported using TFA.

There were no cases of lower extremity embolism or compartmental syndrome during procedures with TFA.

CONCLUSIONS

The stroke and upper extremity access complication rates are described in a low but still considerable percentage. The transfemoral catheterization techniques apparently reduce the need for aortic arch manipulation and thus reduce such complications.

Further randomized trials focusing in the comparison between UEA and TFA, either by percutaneous or cutdown access, are needed to optimize f/bEVAR techniques.

ENDOVASCULAR REPAIR OF FEMORAL ARTERIOVENOUS FISTULA FOLLOWING GUNSHOT WOUND

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Keywords: *traumatic arteriovenous fistula, femoral artery injury, traumatic vascular injury, endovascular repair*

INTRODUCTION

Post-traumatic arteriovenous fistula (AVF) is a rare complication following vascular injuries. They occur mostly due to penetrating trauma, especially gunshot wounds. Early diagnosis and treatment are essential to prevent subsequent complications. To this date, management algorithms are still lacking.

OBJECTIVES

We present a case report of a 19-year-old man with an acute fistula following gunshot wound to the inguino-femoral region.

MATERIALS AND METHODS

The patient was admitted for monitoring. Computed tomography angiography (CTA) at admission showed no signs of AVF. During hospital stay, the patient developed fremitus in the anterior region of the thigh and persistent drop in hemoglobin values. Follow-up CTA showed femoral AVF. He developed extensive skin lesion with associated necrosis. The patient underwent endovascular repair using covered stent placement with immediate resolution of AVF.

RESULTS

First day post-angiography with palpable distal pulses and no signs of AVF in doppler ultrasound of venous femoro-iliac axis. Patient was discharged at day 2 against medical advice and recommended to continue treatment with dual antiplatelet therapy and smoking cessation.

CONCLUSION

Post-traumatic AVF is a rare condition and early diagnosis requires high suspicion index. Prompt treatment is advised to prevent complications of a chronic AVF, but guidelines are still lacking. Classic surgical approach involves open repair often used in more complex situations. New endovascular strategies have shifted treatment paradigm, offering a minimally invasive approach with its known benefits and excellent outcomes.

CONTRALATERAL STENOSIS IS A PREDICTOR OF LONG-TERM ADVERSE EVENTS IN CAROTID ENDARTERECTOMY

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Keywords: *Carotid endarterectomy, Carotid stenosis, MACE, Survival analysis*

INTRODUCTION

Contralateral carotid stenosis (clCS) has been described as a perioperative predictor of mortality after carotid endarterectomy (CEA). However, its predictive value on long-term cardiovascular events remains controversial.

OBJECTIVES

The study aims to assess the potential role of clCS as a long-term predictor of major adverse cardiovascular events (MACE) in patients who underwent CEA.

MATERIALS AND METHODS

From January 2012 to July 2020, patients who underwent CEA with regional anesthesia for carotid stenosis in a tertiary care and referral center were eligible from a prospective database, and a post hoc analysis was performed. The primary outcome included the occurrence of long-term MACE. Secondary outcomes comprised all-cause mortality, stroke, myocardial infarction, acute heart failure, and major adverse limb events.

RESULTS

A total of 192 patients were enrolled. With a median 50 months follow-up, chronic kidney disease (CKD) (MST 51.697 vs. 103.307, p<0.010) and peripheral artery disease (MST 75.066 vs. 90.256, p=0.001) were associated with decreased survival time. After propensity score matching (PSM), CKD (MST 49.127 vs. 106.010, p=0.001) and PAD (MST 75.665 vs. 93.966, p=0.001) maintained this association. On multivariate Cox regression analysis, contralateral stenosis was associated with higher MACE (hazard ratio (HR) = 2.035; 95% CI: 1.113-3.722, p=0.021 and all-cause mortality (HR = 2.564; 95% CI: 1.276-5,152 p=0.008). After PSM, only all-cause mortality (HR 2.323; 95% CI: 0.993-5.431, p=0.052) maintained a significant association with clCS. On multivariable analysis, clCS (aHR 2.367; 95% CI: 1.174-4.771, p=0.016), age (aHR 1.039, 95% CI: 1.008-1.070), CKD (aHR 2.803; 95% CI: 1.409-5.575, p=0.003) and PAD (aHR 3.225, 95% CI: 1.695-6.137, p<0.001) were independently associated with increased all-cause mortality.

CONCLUSION

Contrary to MACE, clCS is a strong predictor of long-term all-cause mortality after CEA. However, MACE risk may compromise CEA benefits by other competitive events. Therefore, further studies are needed to better establish the role of clCS on postoperative events and on patients' specific assessments in order to determine the best medical treatment and easy access to surgical intervention.

INCIDENCE OF MYOCARDIAL INJURY IN PATIENTS SUBMITTED TO CAROTID ENDARTERECTOMY: A SYSTEMATIC REVIEW ANALYSIS

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Keywords: *Myocardial injury following noncardiac surgery, Carotid endarterectomy, MINS, Troponin elevation*

INTRODUCTION

Myocardial injury following noncardiac surgery (MINS) is diagnosed in 8% of all surgical patients. Furthermore, one in five vascular patients develops MINS. However, its incidence is still unclear in patients undergoing carotid endarterectomy (CEA). Higher mortality and major adverse cardiovascular event rates have been described for short- and long-term follow-up periods in this subset of patients.

OBJECTIVES

This systematic review with meta-analysis aimed to determine the incidence of MINS in patients undergoing CEA.

MATERIALS AND METHODS

Three electronic databases, MEDLINE, Scopus, and Web of Science, were used in the search for studies assessing troponin elevation in the postoperative setting of patients undergoing CEA. From the selected studies, the incidence of MINS, considered MINS definition, cut-offs values, and short/long-term outcomes, when available, were extracted. The incidence of MINS was determined by resorting to a bivariable random-effects meta-analysis. Assessment of studies' quality was performed using NHLBI and RoB 2 tools and heterogeneity was also estimated.

RESULTS

Eighteen studies were included, with a total of 117933 participants. Four of them were RCTs, while the remaining were cohort studies. Incidence of MINS were 6.3% (95% CI 0.02-0.022, I2= 90%) and 11.5% (95% CI 0.003-0.233, I2=99%), respectively.

CONCLUSION

This systematic review suggests that the assessed incidence of MINS in patients undergoing CEA could be substantial and higher than other surgical specialties, which might have significant value in these patients.

A RARE CASE OF EPITHELIOID ANGIOSSARCOMA

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INTRODUCTION

Epithelioid angiosarcoma is a rare high-grade vascular neoplasm that is most commonly found in the deep soft tissues of the extremities or in other locations such as the thyroid gland, skin, adrenal glands and bone. Typically occurring in men around the seventh decade of life, it is an aggressive tumor that tends to invade locally and metastasize early, giving patients a 10-15% 5-year survival rate.

OBJECTIVES

We describe a case of epithelioid angiosarcoma with an unusual presentation as deep venous thrombosis and suspected adventitial cystic disease of the popliteal artery, in a patient without risk factors for angiosarcoma.

MATERIALS AND METHODS

We present a case of a 77 years-old man with no relevant past medical history except for a diagnosis of popliteal and soleal vein thrombosis treated with apixaban in the previous month. The patient was referred to a vascular surgery consultation following complaints of ipsilateral persistent lower limb pain/paraesthesia at rest as well as claudication.

RESULTS

Due to absent popliteal and distal pulses an arterial echo-doppler was performed, revealing a recent-appearing thrombosis of the distal third of the superficial femoral artery and a bulky mass at the popliteal fossa. As the integrity of the arterial wall could not be assessed, the diagnostic hypotheses were a thrombosed popliteal aneurysm or adventitial cystic disease. Further investigation with CT-scan and MRI confirmed adventitial cystic disease of the popliteal artery, with the radiologist referring it was unlikely to be a neoplastic lesion. As the patient maintained constant intense and refractory pain surgery was proposed. Popliteal mass excision with femoral-tibial bypass using an ePTFE and contralateral inverted great saphenous vein graft was performed. Surgery and postoperative period were uneventful. The pathology report revealed an epithelioid angiosarcoma and the patient was referred to a Sarcoma Reference Center. Upon admission he complained of pain and lower limb oedema and, while waiting for staging exams, developed agitation and fever and was hospitalized. A PET-scan revealed extensive persistence of disease in the lower limb as well as nodal, pulmonary and possibly bone metastases. Following an unfavorable clinical evolution, the patient was discussed in a Multidisciplinary Team Meeting and was considered unfit for systemic treatment. The patient died at the 19th day of admission.

CONCLUSION

Epithelioid angiossarcoma is a rare and highly aggressive tumor. Preoperative diagnosis is challenging due to a nonspecific presentation (asymptomatic mass, or local symptoms of pain, erythema and swelling) and nonspecific imaging findings, warranting the need for suspicion of this neoplasm.

EARLY EXPERIENCE WITH A NEW HIGH-PRESSURE ANGIOPLASTY BALLOON FOR TREATMENT OF HEMODIALYSIS VASCULAR ACCESS STENOSIS

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Keywords: *vascular access, angioplasty, high-pressure balloon*

INTRODUCTION

Hemodialysis vascular access stenosis continues to be a predominant factor leading to access failure.

OBJECTIVES

We attempted to determine the safety and efficacy of a new high-pressure angioplasty balloon for the treatment of vascular access stenosis.

MATERIALS AND METHODS

We reviewed all cases of vascular access angioplasty using a new high-pressure balloon between March, 1, 2021, and September 9, 2021, at our group. Procedural details were examined, including technical success, patency rates, and complications within 30 days of intervention.

RESULTS

A total of 67 patients were identified, 39 males and 28 females, with a median age of 74 years (range, 22-92). Two patients had Gracz AV fistulas, 11 AV grafts, 16 radiocephalic AV fistulas, 12 transposed brachiobasilic AV fistulas, and 26 brachiocephalic AV fistulas. Preintervention fistulography demonstrated inflow, outflow or/and interaneurysmal stenosis in all patients studied. High-pressure balloon angioplasty was selectively performed at the area of stenosis with balloon insufflation times between 120 and 180 seconds. The balloon diameter ranged from 6 mm to 10 mm, with the 7-mm balloon most frequently used (37), followed by the 8-mm (17). Technical success was 91%. Seventeen inflow, 48 outflow and 16 interaneurysmal stenosis were treated. Four patients needed drug eluting stent/stent-graft implantation due to recurrent immediate recoil, and 1 patient needed stent-graft due to vein rupture. Thirty-day primary patency was 97%. Four patients required reintervention to maintain AV access patency within the study time period at 14 days, 17 days, 91 days, and 92 days post high-pressure angioplasty. Mean follow-up time was 111 days (range, 35-227).

CONCLUSION

Initial early experience with a new high-pressure angioplasty balloon for dialysis access stenosis suggests that it is a safe and feasible option for treating failing vascular access. Early primary patency rates are good in this heterogenous group of vascular access patients.

DETERMINANTS OF QUALITY OF LIFE IN PATIENTS WITH POST-THROMBOTIC SYNDROME

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Keywords: *Post-thrombotic syndrome, deep vein thrombosis, Villalta scale, VEINES-QoL/Sym*

INTRODUCTION

Chronic post-thrombotic syndrome (PTS) may develop in up to 50% off patients after deep vein thrombosis (DVT) and may reduce patients' quality of life (QoL).

OBJECTIVES

We aimed to characterize long-term effects of DVT in PTS and QoL. As a secondary outcome we evaluated independent determinants that might be related to PTS and QoL.

MATERIALS AND METHODS

We selected patients with iliac or femoropopliteal DVT observed in Vascular Surgery consultation in our institution from October 2020 to September 2021. Inclusion criteria included patients with 18-70 years-old with unilateral DVT >6 months before consultation. Patients with total vein recanalization after fibrinolysis/thrombectomy/stenting, bedridden/with limited mobility were excluded.

Epidemiology factors, comorbidities, medication, use of compression stockings and venous ultrasound data were collected. Villalta scale was applied by the physician to access PTS degree (0-4 no PTS, 5-9 light PTS, 10-14 moderate PTS, ≥15 or venous ulcer severe PTS). Patients were asked to fill VEINES-QoL/Sym questionnaire, a disease-specific score that measures the impact of venous disease on the patient's QoL and symptom severity (higher scores indicating better QoL).

Mann-Whitney U Tests were used in continuous variables and Chi-Square/Fisher's tests in parametric variables to compare characteristics of patients with iliac and femoropopliteal DVT. Spearman's rank test was calculated to evaluate correlation between PTS degree and VEINES-QoL/Sym score. Logistic regression analysis was performed to analyse predictors of PTS and finally multiple regression to predict value of variables if P-value<0.2. Significant statistical value was set as P-value<0.05.

RESULTS

56 patients accepted entering the study. 66.1% were female, 64.3% (n=36) had iliac and 35.7% (n=20) femoropopliteal DVT. Iliac and femoropopliteal DVT groups were similar except for age (higher in femoropopliteal, P=0.006), internment (higher in iliac, P<0.001) and time of follow-up (higher in iliac, P<0.001). PTS was present in 52.8% of iliac and 65.0% of femoropopliteal DVT patients (P=0.413).

There was a significant correlation with PTS degree and both VEINES-QoL and VEINES-Sym scores (respectively r=-0.63 and r=-0.53, P<0.001). Major depression (OR=5.63, P=0.045, VEINES-QoL 63.7%±16.6% with depression versus 78.0%±16.0% without) and using compressing stockings (OR=4.69, P=0.041, VEINES-QoL 73.3%±18.3% using stockings versus 73.5%±16.8% without) were the only independent factors associated with PTS syndrome. Deep vein fibrosis/obstruction/reflux (OR=3.28, P=0.174), gender, iliac DVT and time after DVT (P>0.2) were not significantly associated with PTS syndrome.

CONCLUSION

VEINES-QoL/Sym has a good correlation with PTS degree. In our study, PTS was associated with depression and compliance to compressing stockings. However, patients with PTS using compressing stockings didn´t have lower QoL scores.

ENDOVASCULAR THROMBOASPIRATION IN THE MANAGEMENT OF ACUTE KIDNEY ISCHEMIA: CASE REPORTS

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Keywords: *acute renal ischemia, renal artery occlusion, endovascular, thrombectomy*

INTRODUCTION

Acute renovascular ischemia is defined as a sudden interruption of arterial and/or venous renal blood flow. It may involve either partial or complete ischemia of one or both kidneys. Because the renal arteries are considered end arteries, acute ischemia can rapidly progress to irretrievable loss of renal function if it goes unrecognized or untreated.

OBJECTIVES

We present 2 cases of acute renal ischemia treated with endovascular thrombectomy in the emergency setting.

RESULTS

Patient A was a 46 year old male, current smoker of 66 packs-years and with no other co-morbidities. He presented to the emergency department with an acute right lower back pain with 7 hours of evolution. Lab workup was normal. Angio-CT revealed occlusion of the right renal artery.

Patient B was a 76 year old female, with previous history of hypertension, dyslipidemia, aortic valve stenosis and atrial fibrillation (under anticoagulation with DOAC). Patient presented to the emergency department with a lower abdomen pain and vomiting for the past 4 hours. Lab workup revealed an acute kidney injury (AKI) (creatinine 1.59 mg/dL, urea 76 mg/dL) and angio-CT showed left renal artery occlusion with ischemic spots in the kidney parenchyma.

Heparin anticoagulation was immediately initiated and then both patients were treated in the angio suite. A percutaneous ultrasound guided brachial access was obtained and endovascular thromboaspiration with Penumbrasystem was successfully performed, followed by catheter-directed thrombolysis (CDT). At the end of the procedure, renal perfusion was restored and pain relieved.

CONCLUSION

We present 2 cases of acute renal ischemia in patients with very distinctive medical history. In patient B, cardiac embolism was the presumed cause of renal artery occlusion, but in patient A no embolic sources were determined.

One of the fears in evaluating and treating patients with acute renal ischemia is the possible worsening of AKI due to the use of contrast medium during angio-CT and Digital Subtraction Angiography (DSA), but it can be reduced by using few technical precautions.

Aspiration thrombectomy and CDT for acute renal artery occlusion is a safe modality of therapy and should be attempted for the purpose of kidney salvage, even in the setting of prolonged ischemia. Although general consensus exists to affirm that early diagnosis and treatment could reduce the ischemic injury, there are currently no guidelines on the timing of treatment, but revascularization may be considered in patients presenting with acute ischemia and potentially salvage- able renal function.

THE EARLY PERIOD AFTER VARICOSE SURGERY AND ULTRASONOGRAPHY ASSISTED SCLEROTHERAPY

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Keywords: *Ultrasonography, Varicose Surgery, Foam Sclerotherapy*

INTRODUCTION

Foam sclerotherapy, accompanied by ultrasonography (US), is a facilitating and efficacy-enhancing method for the treatment of varicose veins.

OBJECTIVES

With minimally invasive procedures performed in this way, the need for reoperation is reduced, while at the same time optimal treatment of venous insufficiency and symptoms is provided. In this study, we investigated the results of sclerotherapy of postoperative residual varices using US.

MATERIALS AND METHODS

In this retrospective study, patients who were followed up and treated in addition to surgical treatment of varicose veins between 2019 and 2021were examined. Demographic and outcome data of patients who underwent NIR-guided foam sclerotherapy were collected and analyzed.

RESULTS

A total of 257 patients were treated with foam sclerotherapy. Of the patients, 105 (40.8%) were male and 152 (59.2%) were female. Their ages range from 20 to 64, with an average age of 48.3. 4 (2.6%) of the patients underwent varicose vein excision, 137 (90.7%) varicose vein excision and stripping, 10 (6.6%) stripping, varicose vein excision and parva surgery were performed. An average of 1.64±1.05 sessions of sclerotherapy was applied, consisting of 1 session in 70 patients, 2 sessions in 37 patients, 3 sessions in 20 patients and 4 sessions in 11 patients. 13 patients, all male, did not require sclerotherapy.

No residual leakage was observed in saphenous vein controls. While only 12 (4.66%) patients had superficial venous thrombosis, 23(8.94%) patients had hyperpigmentation.

CONCLUSION

Surgical treatment of venous insufficiency is a safe and effective method. However, residual heirs remain. Foam sclerotherapy with US is a minimally invasive and safe treatment method for small and invisible residual varicose veins after the operation.

Although sclerotherapy requires fewer sessions in male patients, it has been observed that it has a great effect on clinical improvement if it is applied.

UNEXPECTED CHALLENGES IN ENDOVASCULAR SURGERY- REGARDING A CLINICAL CASE

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Keywords: *Endovascular, Challenges*

INTRODUCTION

Surgeons' strategy to prevent and manage endovascular challenges does not seem to be an issue openly discussed within the profession.

OBJECTIVES

To discuss the importance of being prepared and having material for the resolution of complications and challenges during endovascular surgery.

MATERIALS AND METHODS

Descriptive analysis of a rare and challenging endovascular clinical case.

RESULTS

A 79 year-old male, smoker and hypertensive, complains of disabling claudication of the right lower limb that didn´t improve with medical treatment (acetylsalicylic acid, statin, cilostazol and daily gait). On objective examination, he only had bilateral femoral pulses.

CT-angio revealed dissection of the right common iliac artery and occlusion of the distal superficial femoral artery (SFA) to the proximal popliteal artery at an extension of 10 cm with extensive calcification.

Recanalization of the femoropopliteal sector and placement of covered stent in the right common iliac artery was proposed.

First was performed left common femoral artery (CFA) puncture, cross over and placement of a 6F sheath in the right SFA, recanalization and percutaneous angioplasty with drug eluting balloon and placement of 2 Eluvia Stents at the femoropopliteal disease segment.

Subsequently, puncture of the right CFA and placement of a VBX stent 8*59 at the right common iliac artery (CIA). As it was noted that it had an excessive length, occluding the right internal iliac artery the stent was removed. During removal, the stent became loose inside the CIA, having migrated to the aorta. Through the guide, a balloon of 6 mm was placed to open the endoprosthesis and replace the prosthesis in the right iliac sector, but it was unsuccessful. Catheterization of the endoprosthesis via the left CFA was performed, making it possible to replace it between the aorta and the left CIA. After, was performed endovascular reconstruction of the aortic bifurcation and the right CIA with two more VBX stents.

The patient is asymptomatic and control CT angiography at 30 days showed excellent results.

CONCLUSION

When endovascular unexpected challenges appear, common sense and explicit experiences (own, referred or published) can be very useful for managing the unexpected.

In authour´s oppinion, this type of case reports are very important because although common sense and personal experience may improve only with seniority, a systematic approach based in a previous layout of the problem enlightened by the experience of others, may be learned.

SURGICAL CORRECTION OF A TYPE B AORTIC DISSECTION WITH FALSE LUMEN INDUCED THROMBOSIS VIA CANDY-PLUG TECHNIQUE - CASE REPORT

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Keywords: *Aortic Dissection, Candy Plug, Ultrasound, TEVAR*

INTRODUCTION

Traditionally, the majority of Stanford type B, or non-type A, acute aortic dissection were treated with best medical treatment (BMT), as it represents the cornerstone of their management during the acute phase. Thoracic endovascular aortic repair (TEVAR) represents a pivotal role in the treatment of aortic dissection in the subacute and chronic phases.

Furthermore, TEVAR has been reported to be safe and effective in preventing aortic enlargement and promoting thrombosis of the false lumen at long-term follow-up.

A limitation of endovascular therapy is continued retrograde false lumen perfusion with back-flow from distal entry tears. Treatment strategies in chronic Type B Aortic Dissections (cTBAD) should aim at false lumen thrombosis, resulting in a significantly lower aortic related mortality.

In this case, the Candy-Plug Technique was used, consisting on its placement into the false lumen. Suitability for the use of the Candy-Plug Technique includes available access to the false lumen at the iliac or infrarenal level, and sufficient extension of the dissection above the celiac trunk to accommodate the introduction system with an aortic diameter bellow 42 mm.

RESULTS

A 56 years-old man, under outpatient follow-up since 2014, when he was diagnosed with an uncomplicated Type B Aortic Dissection (TBAD). All visceral branches had its origin in the true lumen, exception to the right renal artery. After further aneurismatic degeneration of the thoracic aorta to 8 cm, the patient was submitted to a Frozen Elephant Trunk (FET) in November 2020.

In order to reduce the risk of spinal cord injury a metachronous procedure to the distal thoracic part of the cTBAD was planned and the patient was submitted in March 2021. A bilateral percutaneous femoral access was performed and a Pioneer ultrasound catheter was used to distinguish the true and false lumen. Subsequently, the endoprothesis was deployed at the level of the thoracic aorta middle third to the level of celiac trunk and the Candy Plug was implanted in the false lumen 2cm above the lower limit of the TEVAR.

The final angiography showed patency of both the true lumen and right Renal Artery and complete thrombosis of the false lumen in the thoracic region. The postoperative period occurred without adverse events.

CONCLUSION

Open and endovascular surgery are feasible and complement each other in complex Type B aortic dissections. Thus, this two-stage approach is associated with clinical improvement, acting as complementary procedures in the correction of cTBAD. Further follow-up will assess the long-term success.

THE IMPACT OF THE COVID PANDEMIC IN VASCULAR ACCESSES IN A TERTIARY HOSPITAL

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Keywords: *Vascular Access, Chronic Kidney Disease, COVID*

INTRODUCTION

Chronic kidney disease (CKD) is an important cause for decreased quality of life. In many cases, these patients have several comorbidities that increase the risk of adverse events. Venous vascular accesses are a major part of the care that hospitals must give to CKD patients. The COVID-19 pandemic put the care of the other pathologies under intense pressure.

OBJECTIVES

The objective of this work was to primarily verify the response capacity of a tertiary hospital regarding time between referral and consult, consult and surgery, referral and surgery and surgery and first post-operative evaluation by comparing the pre-COVID period with the post-COVID period.

MATERIALS AND METHODS

Records from a tertiary hospital were retrieved using the ICD-9 and ICD-10 codes for venous vascular accesses between March 2017 and December 2020. They were analyzed and information regarding patients' characteristics, comorbidities, referral date, consult date, surgery date, first postoperative evaluation and access information were retrieved. Statistical analysis was performed using SPSS version 27.

RESULTS

A total of 582 procedures were performed in the analyzed period and a total of 568 accesses were created, 506 being made pre-COVID and 62 post-COVID. Regarding patients' characteristics, the groups were similar except for history of stroke ($p=0,044$). The time from referral to vascular surgery consult was significantly increased for the COVID group (18 ± 23 vs 28 ± 44; $p<0,001$) while the time from consult to surgery was significantly shorter (76 ± 77 vs 40 ± 57; $p<0,001$). This resulted in significant less time from referral to surgery in the COVID group (103 ± 77 vs 88 ± 55; $p=0,008$). There was not a significant difference between the two groups regarding the time from surgery to the first postoperative evaluation (35 ± 38 vs 43 ± 32; $p=0,150$). The global rate of working access was 75,4% (n=428), while 49,8% (n=213) of these were effectively canulated. The difference between the working rate of pre-COVID (76,3%; n=386) and post-COVID (67,7%; n=42) groups was statistically significant ($p=0,004$).

CONCLUSION

The ability of hospitals to adapt their resources to respond to non-COVID patients was paramount to mitigate its impact. In our hospital, time from referral to consult was increased significantly during the first months of COVID but the time from consult to surgery was significantly reduced. Overall, these results show that despite the overwhelming number of COVID patients, there was a successful effort to expedite the construction of a venous vascular access.

EXTENSIVE ENDOVASCULAR REVASCULARIZATION AND MODERN SPINAL CORD STIMULATION: DEFYING LIMITS OF CHRONIC LIMB-THREATENING ISCHEMIA

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Keywords: *Infrapopliteal stenting, spinal cord stimulation, limb ischemia pain, Chronic Limb-Threatening Ischemia*

INTRODUCTION

Although advanced Chronic Limb-Threatening Ischemia (CLTI) with extensive complex arterial lesions are typically preferred for open surgery revascularization, not all patients are suitable candidates. Also, controversy remains regarding primary stenting in infrapopliteal arteries. Diversely, according to CLTI guidelines, Spinal Cord Stimulation (SPS) offers modest pain relief and is not a cost-effective treatment.

OBJECTIVES

Report a case of extensive hybrid revascularization in a patient with CLTI in which modern SPS was used for pain relief and to review current literature.

MATERIALS AND METHODS

PubMed literature review with the terms "infrapopliteal stenting", "anterior tibial stenting", "spinal cord stimulation pain", "spinal cord stimulation limb ischemia".

RESULTS

A 61-year-old ex-smoker male was diagnosed with primary myelofibrosis after left lower limb revascularization (femoro-distal bypass surgery). The patient begun to experience very intense pain 1-month after bypass thrombosis. Neither prostaglandins infusion, hyperbaric chamber treatments, epidural catheter with paraplegia inducing doses, nor high analgesic doses relieved pain.

Blisters and extensive bilateral leg skin ulcers developed due to important pendency swelling. Emergent left lower limb major amputation was performed due to phlegmon/sepsis. Right limb CT-angiography revealed a 5cm-lenght femoral superficial artery (FSA) stenosis/occlusion at origin and a 30cm-length FSA/popliteal artery occlusion with anterior tibial artery (ATA) recanalization, ankle-brachial index 0,22, WIfI stage 4. Hybrid surgery was performed with femoral tripod/FSA endarterectomy using 3 patches, endovascular FSA/popliteal/ATA subintimal recanalization was performed and 4 stents were deployed (2 in FSA, SuperaTM stent in popliteal artery and Xpert ProTM at ATA origin due to recoil). SPS WaveWriter AlphaTM was inserted in D10-D11 epidural space after laminectomy due to wound intense pain despite high opioid doses. The patient experienced 80% reduction in pain without medication and tolerated negative pressure therapy with great wound evolution. Pedal pulse is palpable at 5 months follow-up.

Although infrainguinal bypass is preferred for advanced CLTI, patients may lack a target vessel or have extensive wounds overlying a bypass target. According to literature, limb salvage may be similar in open and endovascular infrapopliteal surgery and stenting is better than angioplasty for restoring immediate vessel patency with no difference in 6-months patency rate.

SPS may increase tcpO2 and limb survival in selected CLTI patients not amenable to revascularization while supressing pain. Novel combination SPS capable of simultaneous waveforms like WaveWriter AlphaTM (launched September 2020) showed a higher response and degree of pain relief.

CONCLUSION

This case highlights the importance of adapting revascularization techniques to each patient. Novel SPS may be cost-effective in selected CLTI patients.

EVALUATION OF THE INFLUENCE OF POSTOPERATIVE GLYCEMIC CONTROL ON THE OUTCOMES OF LOWER LIMB BYPASS SURGERY

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Keywords: *bg2009135*

INTRODUCTION

Hyperglycemia in surgical patients, with and without diabetes, has been documented as a marker of poor clinical outcomes in several studies. However, evidence is limited regarding its impact on patients undergoing lower limb revascularization.

OBJECTIVES

To study the association between postoperative hyperglycemia and the development of short- and long-term complications after lower limb bypass surgery (LLBS).

MATERIALS AND METHODS

A retrospective review of consecutive patients undergoing open bypass surgery was carried out at a Vascular Surgery Department in the period from January 2013 to December 2018.

For this purpose, clinical data were obtained through the SClinico® Program, with subsequent recording and statistical analysis using the Statistical Package for the Social Sciences®. The highest blood glucose value assessed in the first 24 hours after surgery was recorded. The primary endpoints were bypass patency, major amputation and death.

RESULTS

Data from 168 consecutive patients were collected and analyzed. 42,5% of patients who underwent LLBS had postoperative hyperglycemia (blood glucose >140 mg/dl). Mean age was 68 years and follow-up time was 40.2 months. Of the patients with hyperglycemia, 8 grafts evolved to have a hemodynamically significant stenosis (10.5% vs 8.9%), 26 had graft thrombosis (34.2% vs 37.8%), 9 had major amputations (11.8% vs 17.8%) and 2 died (2.6% vs 6.7%) (all $P > .05$).

CONCLUSION

In this single-institution study with long-term follow-up, high postoperative blood glucose levels did not have association with the development of the assessed adverse vascular events.

CYSTIC ADVENTITIAL DISEASE OF THE POPLITEAL ARTERY

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Keywords: *Doença cística da adventícia*

INTRODUCTION

Cystic adventitial disease is a rare vascular condition affecting mostly the popliteal artery. It usually courses with a clinical presentation of intermittent claudication during exercise. The etiology is still a matter of strong debate, with trauma, systemic, ganglionic or embryonic developmental diseases currently proposed. Treatment depends on the vessels affected, and removal of the cyst with preservation or replacement of the artery has had promising results. Long-term follow-up is mandatory as recurrence may occur.

OBJECTIVES

To describe a case of a patient with cystic adventitial disease with clinical signs of intermitent claudication, treated surgically with cyst excision without the need for arterial reconstruction.

RESULTS

A 55-year-old female patient was referred to the vascular surgery department for symptoms of intermittent claudication of the right lower limb after 5 minutes of walking. Lower limb arterial ultrassonography revealed a nodular structure adjacent to the right popliteal artery measuring 18 x 12mm, with no evidence of luminal changes and triphasic flow. Physical examination revealed distal pulses in both lower limbs.

The complementary study with Angio-MRI revealed the presence of a polylobulated ganglionic cyst adjacent to the posterior aspect of the posterior cruciate ligament of the right knee, which extended through the thickness of the posterior capsule as far as the popliteal artery, involving its adventitial layer in a circumferential fashion with a maximum axial diameter of 25x13mm, longitudinal extension of 28mm and thickness of 3mm, but without affecting the reduction of the luminal calibre or integrity of the intimal wall.

The patient was submitted to surgery in the ventral decubitus position under regional anaesthesia and a posterior approach to the popliteal artery with an S-shaped incision. After dissection, the presence of a cystic structure involving the popliteal artery with gelationous content was confirmed. It was removed together with the arterial adventitial layer without the need for arterial reconstruction. Histological examination confirmed the diagnosis. The patient was discharged on the 4th postoperative day and at 1-month follow-up there was no recurrence of symptoms.

CONCLUSION

Although rare, cystic adventitial disease should be included in the differential diagnosis of intermittent claudication, especially in middle-aged patients without cardiovascular risk factors. Doppler ultrasonography, CT or MRI angiography are important tools for a correct diagnosis. Its treatment may include cyst excision with or without the need for arterial reconstruction.

PREDICTING OUTCOMES OF LOWER LIMB OPEN REVASCULARIZATION USING THE MODIFIED 5-ITEM FRAILTY INDEX

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Keywords: *lower limb open revascularization, modified 5-item frailty index*

INTRODUCTION

Frailty has a great influence on postoperative outcomes in patients undergoing surgery. It is important to identify vulnerable patients to predict long-term morbidity and mortality, and guide clinical decision.

OBJECTIVES

The authors pretend to evaluate the modified 5-item frailty index (mFI-5) as a predictor of long term complication in patients submitted to lower limb open revascularization in their institution.

MATERIALS AND METHODS

Retrospective analysis of patients consecutively submitted to lower limb open revascularization from January 2013 to December 2018. The mFI-5 score was calculated based on the presence of the 5 comorbidities factors: congestive heart failure within 30 days prior to surgery, diabetes mellitus, chronic obstructive pulmonary disease or pneumonia, hypertension requiring medication and partially dependent or totally dependent functional health status at time of surgery. The primary endpoints were bypass patency, major amputation and 30-days mortality. The statistical analysis was done with SPSS, v26.

RESULTS

There were 168 patients submitted to lower limb open revascularization. 76,8% were male, median age was 68 years, and median follow up time was 40,2 months. The median mFI-5 score was 1, with a minimum score of 0 and a maximal score of 4. Long term graft complications happened in 45,8%, graft thrombosis in 36,9%, major amputation in 15,5%, and 30 days mortality in 3% of patients. Frail patients (mFI-5 score of 2 and above) had similar results compared to patients with mFI5 score of 0 or 1.

CONCLUSION

The mFI-5 score did not have an association with bypass patency, major amputation complication or 30-day mortality in this group of patients.

IMPACT OF AGE, SEX AND SEASONALITY ON DEEP VENOUS THROMBOSIS PRESENTATION

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Keywords: *lower limb open revascularization, modified 5-item frailty index*

INTRODUCTION

Deep-vein thrombosis (DVT) has a high overall incidence in the adult population representing a significant burden for health systems. Most cases of DVT present in patients >65 years old, but women aged 20-45 have the highest risk. Several risk factors are described, which may influence DVT presentation, and are of interest to ongoing research.

OBJECTIVES

To describe the anatomical site and laterality of deep-vein thrombosis (DVT) in symptomatic patients using whole leg ultrasound scanning (WLUS), and to assess age and sex distribution and incidence seasonality.

MATERIALS AND METHODS

We conducted a retrospective single centre study of all the WLUS performed in the emergency department for suspected DVT between January 1st 2010 and the 31st of December of 2019. Patient's clinical files were accessed and relevant data extracted.

Thrombosis of the iliac, femoral, and/or popliteal veins is classified as proximal DVT, regardless of the presence of concomitant calf (distal) DVT.

RESULTS

From January 2010 to December 2019, 580 consecutive patients with acute DVT evidence in WLUS were included in our study. DVT was more frequent in women (n= 346; 59,7%) and in patients older than the age of 65 (53,0%) , although most women present before the age of 65 (51,7%) and men are more frequently diagnosed after the age of 65 (62,2%). Both men and women have an increased incidence of left leg DVT (51,7% and 62,6%, respectively), but there is a significantly higher incidence of left leg DVT among women ($p<0.05$). When considering only proximal DVT, women also present a significant higher incidence of left leg DVT ($p<0.05$), whereas men have similar left and right DVT incidence. There is an increased incidence of DVT in the Winter, representing 30,9% of all diagnosed cases.

CONCLUSION

We report higher incidence of DVT in women and older patients, in accordance with the current evidence. Also, there is a significant higher risk of proximal left leg incidence of DVT in women, which should draw the attention to May-Thurner syndrome, that is often unrecognized. We found a higher incidence of DVT in the Winter, contributing to the ongoing evidence of increased DVT incidence during cold periods.

Factors such as age, sex and seasonality influence DVT presentation, which can impact prophilaxys and treatment strategies, and prognosis.

ABO-BLOOD GROUPS AND ABDOMINAL AORTIC ANEURYSM RISK AND MORTALITY

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Keywords: *AAA, Blood Group*

INTRODUCTION

ABO and Rh blood types are not only important to hematologists so that they can cross-type blood before transfusions. ABO blood types are also associated with vascular disease.

OBJECTIVES

We wanted to access if blood group is associated with the development of aortic abdominal aneurysm (AAA) and if it impacts post-aneurysmatic repair mortality

MATERIALS AND METHODS

In this retrospective observational study, we enrolled 220 consecutive patients who underwent AAA repair at a tertiary care and referral center from January 2009 to December 2015. Demographic and clinical data were collected from the electronic health records. The distribution of ABO and Rh blood types were compared with the distribution of the population from Porto. Median follow-up time for the primary outcome (death from any cause) was 43.5 months (IQR 28-73 months). We used the log-rank test to determine the association of ABO and Rh blood groups on survival following repair.

RESULTS

Patients submitted to AAA repair were 96% male, had a mean age of 70±9 years old, and 76% were submitted to endovascular repair (EVAR) (versus 24% of open surgical repair [OSR]). Most patients were Rh blood type Rh+ (80%), whereas 20% were Rh-, and ABO blood type A (48%), whereas 42% were O, 7% B and 2% AB. The distribution of ABO and Rh blood types in our sample was similar to the reference population ($p > 0.05$). The patients were followed for a mean of 64 months (95% CI 54 – 75) in the open surgical repair (OSR) group and for 49 months (95% CI 43 – 55) in the endovascular repair (EVAR) group (p-value = 0.032). Patient survival after aneurysm repair was 87% at 1 year (95% CI 83 – 92), 84% at 2 years (95% CI 78.9 – 88.9) and 65% at 5 years (95% CI 57.5 – 73.5), and no differences were found between Rh blood group (p-value = 0.67) nor among ABO blood group (p-value = 0.43). At 5 years, survival in open OSR was 72% (95% CI 58 – 86) and after endovascular repair (EVAR) was 62 (95% CI 52 – 72), p-value = 0.09. The distribution of ABO and Rh blood types were similar between the two repair groups.

CONCLUSION

This study suggests that there is no association between blood type and survival following AAA repair.

ENDOVASCULAR STENT DETACHMENT AS A DELAYED COMPLICATION

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Keywords: *Aortic Aneurism, Endovascular repairment, Graft Migration*

INTRODUCTION

Endovascular treatments in thoracoabdominal aortic aneurysms have been found in the last decades.

There may be early and late complications after the interventions.

OBJECTIVES

Although late complications of current endovascular repairs have been reported, experience is needed to understand the phenomenon clearly.

In this case report, we mention a patient who has repaired endovascularly due to a thoracoabdominal aneurysm four years ago and had stent-graft separation and migration in follow-ups.

MATERIALS AND METHODS

An 81-year-old male patient applied with a fusiform aneurysm in the descending aorta and abdominal aorta four years ago (Movie 1). Dilatation starting from the left subclavian artery's distal was a large and widespread aneurysm involving both main iliac arteries.

The aneurysmatic aortic segment measured 56 mm above the level of the hiatus aorticus.

Dilated aorta up to both common iliac arteries measured 52 mm at the renal level. Approximately 1.5 cm of thrombus material was observed in the wall of the aneurysm (Image 1).

RESULTS

With the selective visceral and parenchymal cannulation, the endovascular repair was performed with the Cardiatis Multilayer Flow Modulator (Cardiatis, Isnes, Belgium) four years ago. After every year the patient applied to the cardiovascular outpatient clinic for follow up (Media contents of the post operative follow ups can be seen in Image 2, Image 3; Movie 2, Movie 3 respectively). Because the patient had back and abdominal pain, he applied to the cardiovascular surgery clinic. In the multislice computed tomography performed four years

after the endovascular intervention, it was observed that the stent-grafts were separated at the abdominal infrarenal level, and the stent-grafts implanted in both main iliac arteries were independently separated (Image 4). In the radiological examination, it was observed that the dilatation of the aneurysm increased further.

CONCLUSION

It is difficult to determine the cause of delayed complications after endovascular repair. Therefore, patients may be complicated for many reasons by resembling the limited studies conducted. In the case we presented, migration and detachment were observed. It can be challenging to determine the cause of this after a long time since the operation. Nevertheless, new materials used and improved surgical experience can minimize the complications observed after endovascular interventions.

RECURRENCE OF VARICOSE VEINS AFTER SURGERY: LIFESTYLE RISK FACTORS AND COMORBIDITIES

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Keywords: *Varicose veins, recurrence, chronic venous disease, surgery*

INTRODUCTION

One of the major drawbacks of the available varicose veins treatments is the inability to completely prevent disease recurrence. Most studies report recurrence rates of up to 80% in long-term follow-up and the etiology of recurrences is still poorly understood. It is paramount to detect the recurrence causes to increase the effectiveness of the varicose veins surgery (VVS) and to improve the quality of patient's life in a lengthier fashion.

OBJECTIVES

Analyze patient's comorbidities and risk factors that could significantly contribute for varicose veins recurrence.

MATERIALS AND METHODS

This was an observational, retrospective cohort study, including consecutive patients (n=224) who underwent VVS in a tertiary hospital, between January and July 2016.

Patients were contacted by phone to answer a questionnaire about their comorbidities, life-style habits, past medical history and the actual venous disease status. Surgery and ultrasound details were extracted from the clinical registries.

Our primary outcomes are CEAP improvement and need for a new VVS at 5 years. Secondary outcome is to compare patients that underwent one VVS versus multiple VVS.

RESULTS

A total of 224 patients underwent VVS. Mean age was 50,12 years and 71% were female patients.

106 (47.3%) patients reported improved CEAP 5 years after surgery. Male gender (64.6% vs 40.3%; P=0.004), an absence of osteoarticular pathology, 49.0% vs 30.0%; p=0.038) and less of pre-operative symptoms (83.3% vs 45.3%; p=0.035) were associated with CEAP improvement.

Fifteen patients (6.7%) needed a reintervention at 5 years. The type of surgery at the index procedure did not associate with the need for a new VVS (6.3% in those treated by open surgery vs 6.7% in those treated with radiofrequency; p=0.949). The patients that need a new VVS after 2016 had more often had a history of deep vein thrombosis (13.3% vs 2.9%; P=0.035).

Sixty two (27.7%) patients had multiple VVS (vs 162 (72.3%)) patients that had only one VVS). Patients who underwent multiple VVS, have more often a history of superficial vein thrombosis (45.2% vs 19.1%; P<0.01).

CONCLUSION

Varicose veins recurrence is a prevalent problem. Although the use of less invasive endovenous methods seems to reduce the incidence of short-term complications, and are therefore advocated, recurrence rates is still similar between open surgery and radiofrequency.

Large studies considering lifestyle risk factor and comorbidities as a cause for varicose veins recurrence are of major importance to better discuss with the patients the risks and benefits of a VVS.

DETERMINATION OF THE FACTORS EFFECTING ENDOTENSION AFTER ENDOVASCULAR REPAIR OF AORTIC ANEURYSMS AND DISSECTIONS

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Keywords: *Endotension, Endocascular Stent Graft*

INTRODUCTION

Aortic aneurysm is abnormal dilatation of the aorta due to the loss of ultrastructural characteristics of the aortic tissue. Dissection occurs when a tear in the inner wall of the aorta causes blood to flow between the layers of the wall of the aorta, forcing the layers apart. Either aneurysms or dissections occur due to non-specific or degenerative reasons. In current practice minimal invasive endovascular therapies (EVAR) increases in number. After the EVAR procedure routin close follow up is necessary for chasing after-procedure complications and the nature of the pathology.

OBJECTIVES

After the EVAR procedures the clinicians usually observe a slow diminish of the aneurysmal diameter. But there are some patients with whom there is no shrinkage but ongoing expansion without demonstrable endoleak. This study aims to determine the factors effecting endotension after EVAR procedure. This will bring out a new exposition to postprocedural follow up practice.

MATERIALS AND METHODS

This study has been carried out in our institution between Janurary 2009 – Decebmer 2020. The preoperative, peroperative and postoperative findings and data of the 94 patients have been recorded. Demographic and postporecdural parameters of the EVAR patients have been evaluated to reveal the factors affecting the expansion of the sac.

RESULTS

The elder age (above the mean value of the group) is found to be a risk factor for development of endotension ($p<0.01$). There is no statistically significant p value with the parameters, blood glucose level, HbA1C, LDL, HDL and Trigliserid levels ($p>0.05$). The markers of the acute or ongoing inflammation; Hs-CRP and neutrophil/lymphocyte ratio had a statistically significant p value ($p<0.05$). Likewise ongoing anemia, higher BMI and the history of COPD had significant p value ($p<0.05$) with heart rate ($p=0.00$), and systolic blood pressure ($p=0.01$). The history of Chronic renal insufficiency and Marfan Syndrome are other clinically significant reasons ($p=0.01$).

CONCLUSION

EVAR is less invasive and succesfull aneurysmal repair procedure that should been followed up by physicians in order to determine morphological changes which may be effect therapeutical approach and the efficacy of the treatment. Preprocedural and postprocedural measurements of the aneurysms can provide a better perspective to figure out possible complications and prognosis. In this study, the factors affecting endotension have been determined and bring out a more reliable and safe patient based roadmap for follow up period.

ACUTE LIMB ISCHEMIA IN A YOUNG PATIENT TAKING TAMOXIFEN

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Keywords: *Tamoxifen, Anticancer agents, arterial thrombosis, ischemia*

INTRODUCTION

A variety of anticancer agents have been shown to increase the risk of thrombotic events in patients with cancer. Tamoxifen, an oestrogen receptor antagonist used in the treatment of patients with oestrogen receptor–positive breast cancer, is associated with a significantly increased risk of both arterial and venous thrombosis.

OBJECTIVES

The aim of this study is to report a successfully treated case of acute limb ischemia in a patient taking tamoxifen.

MATERIALS AND METHODS

Patient's clinical files and auxiliar imaging studies were retrospectively reviewed.

RESULTS

A 44 year-old women, with history of dyslipidemia, smoking habits and breast cancer, was admitted in the Emergency Department due to sudden aggravated symptoms of coldness, paraesthesia and paraparesis in the left arm (interpreted as acute ischemia grade IIb). She had had left breast cancer 2 years before, and was submitted to breast-conserving surgery followed by radiotherapy. She was currently in remission and under tamoxifen medication. Besides this, she had chronic complains of mild loss of sensibility and loss of strength in the left arm since she received treatment regarding her breast cancer.
The Doppler ultrasound revealed left axillar, brachial, and radial artery hypoechogenic occlusion. There were no signs of atherosclerotic plaques. She promptly underwent open thrombectomy that successfully alleviated the symptoms. The day after, coldness, paraesthesia and paraparesis persisted, an angiography was performed showing brachial artery occlusion and catheter-directed thrombolysis (CDT) was decided. After 72 hours of CDT, the angiography showed occlusion of the distal brachial artery and of the radial arteries, but collateral arteries from proximal brachial artery allowed cubital artery flow. At this point, the patient showed improvement of her symptoms and CDT was stopped. She was discharged under anticoagulation (Xarelto 20mg daily). Further evaluation on the cause of the thrombotic event (echocardiogram and Holter) was uneventful. She was also evaluated by dedicated breast surgeons and tamoxifen was replaced by anastrozole in order to decrease her thrombotic risk. Six months after this event, the patient was stable, maintaining her baseline status of sensibility, mobility and strength.

CONCLUSION

With the increasing number of anticancer agents, adverse thrombotic events are likely to remain an issue in the management of patients with cancer. A low suspicion index is needed in these patients to allow early diagnosis and treatment. Further evaluation by dedicated cancer physicians is of paramount importance for management of the anticancer medication to achieve minimum risk of a new thrombotic event.

WHEN AN ULCER DOES NOT HEAL - A CASE REPORT

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Keywords: *Venous disease, Venous Ulcer, Thromboembolism*

INTRODUCTION

Chronic venous disease is prevalent, presenting with pain, oedema and skin alterations in inferior members. Venous ulcer occurs in advanced stages and is debilitating. Its pathophysiology involves genetic susceptibility and risk factors such as obesity, age, immobilisation, smoking, oestrogens or thromboembolism. Venous thrombosis is the most common cause and is also a consequence.

OBJECTIVES

Remember the role of the Family Physician (FP) in prevention, treatment and detection of complications.

MATERIALS AND METHODS

Case report of venous disease complicated with ulcer.

RESULTS

39-year-old lady. Sedentary, overweight, non-smoker. History of repeated abortions, pulmonary thromboembolism and deep vein thrombosis, because of thrombophilia by mutation of the MTHFR gene. She was treated with warfarin, tapentadol, atorvastatin and folic acid. The patient was observed in urgent consultation due to a worsening of chronic pain in the context of a venous ulcer. The patient reported severe pain with worsening over the last four days and when walking. Poor relief with Tapentadol and Tramadol/Paracetamol. No history of trauma, fever or constitutional symptoms. Similar previous episodes, the last one 15 days ago, with several cycles of antibiotherapy. The patient presented a claudicating gait, oedema of the left leg, exudative ulcer with surrounding inflammatory signs and palpable tibial pulses. The exudate was collected and arterial and venous doppler echocardiography was requested. The patient was treated with Ciprofloxacin 500mg bid, Bioflavonoids 1000 mg id and Tapentadol 100mg bid. On re-evaluation the patient maintained an exudative lesion, with a cultural examination identifying S.epidermidis sensitive to Amoxicillin/Clavulanic Acid. Arterial doppler revealed biphasic flows in the left anterior tibial artery, with possible obstructive disease proximal to the segment assessed.

Venous doppler don't assess the great saphenous distally due to the presence of an ulcer, although there was multiple collateral disease at this level. The antibiotherapy was adjusted, the anti-dyslipidemic therapy was intensified, and was recommended elastic stockings, limb elevation and exercise according to tolerance. The patient was referred to Vascular Surgery.

CONCLUSION

In the case described, the venous disease is related to previous thrombotic events, precipitated by hyperhomocysteinemia by MTHFR gene mutation. She presents severe pathology with interference in her quality of life and work absenteeism. The presence of non-healing ulcerations is a referral criterion, although the FP needs to act. Its role is based on the control of modifiable risk factors such as weight loss, physical exercise, periodic monitoring of arterial blood pressure and adjustment of contraception. Bioflavonoids, Sulodexide or Pentoxifylline are also beneficial in its treatment.

NATURAL HISTORY AND SURGICAL TREATMENT OF VENOUS ANEURYSMS: A RETROSPECTIVE ANALYSIS

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INTRODUCTION

Venous aneurysms are rare and therefore their natural history is not fully understood. Indications for treatment are often determined by the location and size of the aneurysm, however, considering the scarcity of data, there are no specific recommendations.

OBJECTIVES

We aim to describe our experience in this type of rare pathology.

MATERIALS AND METHODS

Retrospective observational study on a group of 20 patients with venous aneurysms diagnosed between January of 2007 and December of 2020. Demographic data, anatomic location and medical history including trauma or venous surgery were analyzed. We also evaluated all vascular reconstructions made and primary patency.

RESULTS

We identified a total of 20 patients with venous aneurysms, with a mean age of 57 years (range, 42-75years). Eleven patients were male (55%). The most common anatomic site was the popliteal vein (n=14). Of these, 4 patients (29%) had multiple venous aneurysms: one patient with bilateral popliteal and unilateral common femoral vein aneurysms, two patients with bilateral popliteal vein aneurysms, and one patient with a concomitant left internal jugular vein aneurysm. Eleven patients (79%) underwent treatment with partial aneurysmectomy, aneurysmorrhaphy and patch venoplasty when necessary. The average diameter at the time of surgery was 21.9 mm. The primary patency at 1 year was 100%. With a mean follow-up time of 4 years, popliteal thrombosis due to aneurysm recurrence was observed in 2 patients (18%).

One patient had a 21mm diameter gastrocnemius vein aneurysm, having been proposed for surgery, with thrombosis before the intervention. Two patients had common femoral vein aneurysms, both associated with previous ligation of the saphenous-femoral junction, treated with partial aneurismectomy and aneurysmorrhaphy. Two patients had aneurysms of the superficial venous system of the upper limb, associated with previous trauma, which were treated with simple ligation. Another patient presented with thrombosed bilateral iliac vein aneurysms causing severe edema of both lower extremities. Repermeabilization with catheter fibrinolysis was unsuccessfully attempted. One patient has a 23mm saccular aneurysm of the intrahepatic portal vein branch which is under imaging follow-up.

CONCLUSION

In our experience, the most common location of venous aneurysms is the popliteal vein, and it could be associated with chronic venous disease. The treatment of these aneurysms is important to avoid thromboembolic complications and close follow-up is necessary to detect late recurrence. Aneurysms from other locations are even rarer and if untreated can lead to severe thromboembolic complications.

RISK OF VENOUS THROMBOSIS IN THE PRIMARY CARE SETTING DURING THE COVID-19 PANDEMIC

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Keywords: *COVID-19, Venous Thrombosis, Primary Health Care*

INTRODUCTION

Coronavirus disease 2019 (COVID-19) infection leads to an increased risk of systemic hypercoagulability and thromboembolism. These are attributed to the inflammation cascade activation and the interference with the alternative complement pathway. This risk is unknown in non-hospitalized patients.

OBJECTIVES

This study aimed to determine if patients in the community with prior or current SARS-CoV-2 infection were at increased risk of DVT (Deep Vein Thrombosis) or Superficial Vein Thrombosis (SVT).

MATERIALS AND METHODS

Retrospective analysis of all patients who presented to a primary health care unit and were diagnosed with DVT or SVT from January 2018 to September 2021. Demographic and clinical data were collected including BMI, use of oral combined contraception, smoking status, date of diagnosis of COVID-19 infection and dates of COVID-19 vaccination. Univariate analysis was performed for data assessment, including Chi-Square and ANOVA tests.

RESULTS

Of the 8547 patients who attended a non-programmed consultation in the timeframe, seventy-nine patients (0.9%) were diagnosed with DVT (19) or SVT (60) and were included in the study. Their mean age was 57.3 years, with a female-to-male ratio of 3.2:1. There was no significant association between COVID-19 and the development of DVT or SVT (p=0,151). It was also verified a shift in the predominate gender diagnosed with these conditions (85% females in 2018 versus 53,8% in 2021; p=0.077).

CONCLUSION

Outpatients seen by general practitioners during the pandemic of COVID-19 appear to present a trend towards an increased risk of DVT and SVT compared with patients of an historical cohort. Further studies are necessary to shed some light on this issue since robust evidence is needed to enable clinicians and policymakers to minimize venous thromboembolism risk in patients with SARS-CoV-2 infection.