CONGRESSO SPCCTV

4D VISIONS 19

CARDIAC | THORACIC | VASCULAR | CARDIOLOGY

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Sociedade Portuguesa de CARDIOLOGIA

SURGERY WITHOUT BORDERS

CARDIAC SURGERY

SALA A - Sunday, November 24th, 11:30 a.m.

ORAL COMMUNICATIONS SELECTED FOR THE MANUEL MACHADO MACEDO AWARD

CC01-27087

OUTCOMES OF AORTIC VALVE SURGERY IN NON-STENOTIC VALVES: MECHANICAL REPLACEMENT VERSUS REPAIR

Rui J. Cerqueira (Portugal)[1,2]; Jéni Quintal (Portugal)[1]; Soraia Moreira (Portugal)[1,2]; Francisca Saraiva (Portugal)[1]; Ana Filipa Ferreira (Portugal)[1]; Raquel Moreira (Portugal)[1]; Renata Raimundo (Portugal)[1]; Mário J. Amorim (Portugal)[1,2]; Jorge Almeida (Portugal)[1,2]; Paulo Pinho (Portugal)[2]; André P. Lourenço (Portugal)[1,3]; Adelino F. Leite-Moreira (Portugal)[1,2]

1- Cardiovascular R&D Center, Surgery and Physiology Department, Faculty of Medicine, University of Porto;
2- Department of Cardiothoracic Surgery, Centro Hospitalar Universitário São João;
3- Department of Anesthesiology, Centro Hospitalar Universitário São João

Background: Considering selected patients and the expertise of the surgical team, aortic valve repair (REPAIR) has been recognized as an alternative to aortic valve replacement.
Aim: To compare mid-term survival, need of reoperation and hemodynamic results after mechanical replacement (MECH) or REPAIR in non-stenotic aortic valve disease.
Methods: Retrospective single-center cohort study including consecutive patients younger than 70 years-old, with non-stenotic aortic valve disease, who underwent 1st aortic valve surgery with MECH or REPAIR (2 experienced surgeons), during a 6-year period. Concomitant procedures were not excluded. First follow-up echocardiogram was performed within 3 months after surgery (median). Mean follow-up time was 4 years, maximum 7. According to the data distribution appropriate statistical tests to compare independent samples were used. Mid-term survival and need of reoperation were studied through Kaplan-Meier curves and Cox regression.
Results: MECH was performed in 94 (56.6%) and REPAIR in 72 patients. Individuals in MECH group were older and presented higher NYHA functional class than REPAIR group (51±11 vs 47±13 years, p=0.048; 30 vs 4%, p<0.001). MECH group presented higher prevalence of rheumatic etiology (17 vs 3%, p<0.001). Although aortic root intervention was more frequent in MECH group (41 vs 17%, p<0.001), there were no differences in cardiopulmonary bypass and cross clamping aortic times (166 vs 148 minutes, p=0.16; and 121 vs 108 minutes, p=0.15 in MECH and REPAIR group, respectively). Left ventricle mass regression was similar (18 vs 21%, p=0.450, in MECH and REPAIR group, respectively). Mid-term survival (REPAIR cumulative survival 97% and MECH 93%, Log-Rank test p=0.752) and reoperation rates were similar between the two groups. REPAIR procedure failed in 3 patients: 2 months (new aortic regurgitation, AR), 7 months (infective endocarditis, IE) and 4 years (AR). MECH failed in 2 patients: 6 months (IE) and 2 months after surgery (prosthesis thrombosis).
Conclusion: Aortic valve repair seems to be safe and effective in this single-center study showing similar results comparing with mechanical aortic valve replacement. We should reinforce the need of judiciously select patients for this complex surgical technique and the specialized training of the surgical team. Further studies are needed to provide reliable recommendations on this theme.

CC02-27091

LONG-TERM OUTCOMES OF ROSS OPERATION: A SINGLE-CENTRE EXPERIENCE

André Antunes (Portugal)[1,2]; David Prieto (Portugal)[1,2]; Gonçalo Coutinho (Portugal)[1,2]; Manuel Antunes (Portugal)[3]; Pedro Antunes (Portugal)[1,2]

1 - Cardiothoracic Surgery Centre, University Hospital, Coimbra;
2 - Faculty of Medicine, University of Coimbra;
3 - Emeritus Professor, Faculty of Medicine, University of Coimbra

Introduction: The Ross operation is an excellent surgical option for children and selected young adults, regardless of aortic pathology type.
Objective: We aimed to evaluate the long-term outcomes of patients with aortic valve disease who underwent to a Ross Operation at our institution.
Methods: A retrospective study was performed evaluating all consecutive 45 patients who underwent to a Ross Operation from January 1994 to December 2009.
Results: The mean age was 17 years (1-38 years) and 64% were male. The etiology was congenital anomaly in 19 patients (42%), infective endocarditis in 10 patients (22%) and degenerative or rheumatic pathology in 9 patients (20%). Seven patients were previously submmited

to an aortic valve repair. The mean hospital stay was 12 days (7-48 days). There was no intra-operative mortality, neither 30-day mortality. The mean follow-up was 15 years. Currently, 41 patients (91%) were in NYHA class I. Thirty-five patients (76%) have no autograft regurgitation or mild autograft regurgitation, 5 patients (11%) have moderate autograft regurgitation and 2 patients have ascending aorta dilatation. Four patients (9%) needed reoperation, 3 due severe autograft regurgitation and 1 due severe pulmonary homograft stenosis. One patient died eleven years after surgery due infective endocarditis. There was no thromboembolic complications.

Conclusion: The Ross operation can be performed in children and young adults with good long-term results. The potential of late autograft regurgitation, ascending aortic dilatation or pulmonary homograft stenosis or regurgitation warrants anual follow-up. This surgical solution is especially attractive for children and young adults with active lifestyles who wish to avoid the burden of lifelong anticoagulation, in some cases of infective endocarditis, and in some situations with medical and sanitary poor conditions.

CC03-27094
HYBRID AORTIC ARCH SURGERY TO CREATE A LANDING ZONE IN THE ASCENDING AORTA

António Cruz Tomás (Portugal)[1]; Álvaro Laranjeira Santos (Portugal)[1]; Jorge Pinheiro Santos (Portugal)[1]; Daniela Varela-Afonso (Portugal)[1]; José Fragata (Portugal)[1]

1- Hospital de Santa Marta

Introduction: Thoracic Endovascular Aortic Repair (TEVAR) has enabled the treatment of aortic pathology that previously could only be addressed with open surgery, with higher morbidity and mortality. However, the existence of a favorable landing zone (Lz), without compromising the patency of the supra-aortic vessels is mandatory. This meant that initially, Lz 2 of the Ishimaru classification was the most proximal technically feasible Lz in the endovascular treatment of thoracic aortic pathology.

Objective: Review all patients in our Department who underwent TEVAR following hybrid surgery in order to create a more proximal Lz.

Material and Methods: From November 2007 to October 2019, 80 TEVARs were performed at our Department to 72 patients. Of these, 15 required a hybrid strategy in order to achieve treatment - 9 by replacement of the ascending aorta and debranching of supra-aortic vessels under cardiopulmonary bypass (CPB) and 6 with debranching of supra-aortic vessels and re-routing to the ascending aorta (partial clamping, without CPB). All patients underwent their first postoperative computed tomography angiography (CTA) within 30 days of surgery and follow-up consisted of presential appointments and annual imaging control. Statistical analysis was performed with SPSS™ 25 (©IBM).

Results: The average age of the patients was 65.5 (11.5) years, with 73.3% being male (n=11). The average follow-up was 54.7 (46.2) months. The most common indication was thoracic aortic aneurysm (66.7%), followed by chronic type B aortic dissection (20.0%), penetrating aortic ulcer (6.7%) and reintervention due to endoleak (EL, 6.7%). Surgery was urgent in one patient. There was no in-hospital mortality. The average ICU stay and length of stay was 1.3 ± 0.8 days and 9.8 (10.3) days, respectively. Morbidity consisted of: cerebellar infarction (n=1), central retinal artery occlusion (n=1) and femoral access complication (n=1). Survival at 1- and 5- years was 84.6% and 65.8%, respectively. Throughout follow-up, no EL was detected in 66.7% (n=10) of patients. The incidence of early EL was 26.7% (n=4), of which half (n=2) had spontaneous resolution. Late EL rate was 13.3% (n=2). Endovascular reintervention was required in only one patient due to the increasing size of the EL, and a good surgical result was obtained afterwards.

Conclusion: TEVAR in the context of hybrid surgery is associated with low morbidity and mortality, with a relatively low incidence of EL and good survival. The hybrid strategy is a good alternative in high risk patients for classical surgery, allowing its treatment in a phased approach.

SALA A - Friday, November 22th, 5:00 p.m.
ORAL COMMUNICATIONS

CC04-26033
CAN WE PREDICT THE OCCURRENCE OF POSTOPERATIVE ATRIAL FIBRILLATION AFTER CARDIAC SURGERY?

Jorge Pinheiro Santos (Portugal)[1]; Pedro Coelho (Portugal)[1]; Marta Alves (Portugal)[2]; Ana Luisa Papoila (Portugal)[2]; John Groarke (United States of America)[3,4]; José Fragata (Portugal)[1,2]

1 - Hospital de Santa Marta, CHULC;
2 - Universidade Nova de Lisboa;
3 - Harvard Medical School;
4 - Brigham and Women's Hospital

Introduction: Postoperative atrial fibrillation (PoAF) is the most common rhythm complication after cardiac surgery. It occurs up to 20-40% of patients depending on surgical procedure. PoAF duplicates the risk of stroke in the first operative year, increases short and long-term mortality, prolongs hospital stay and increases costs.

Aim: create a risk model using perioperative variables for the development of early PoAF after cardiac surgery.

Materials and Methods: We performed a retrospective cohort study based on prospectively collected data from elective adult patients operated on the Cardiothoracic Surgery Department between January 2008 and December 2017 (7371 patients). We divided the patients into 5 groups: total sample (4060), aortic valve surgery (1324), CABG (2020), mitral valve surgery (211) and CABG and aortic valve surgery (348). We performed univariate logistic regression using clinical variables of the STS Score and EuroSCORE I as predictors and PoAF as the outcome. We used generalized additive regression models. For the model construction we used multivariate logistic regression and controlled for traditional risk factors for development of AF. We compared clinical outcomes between patients with or without PoAF using t-test and Pearson χ^2 test.

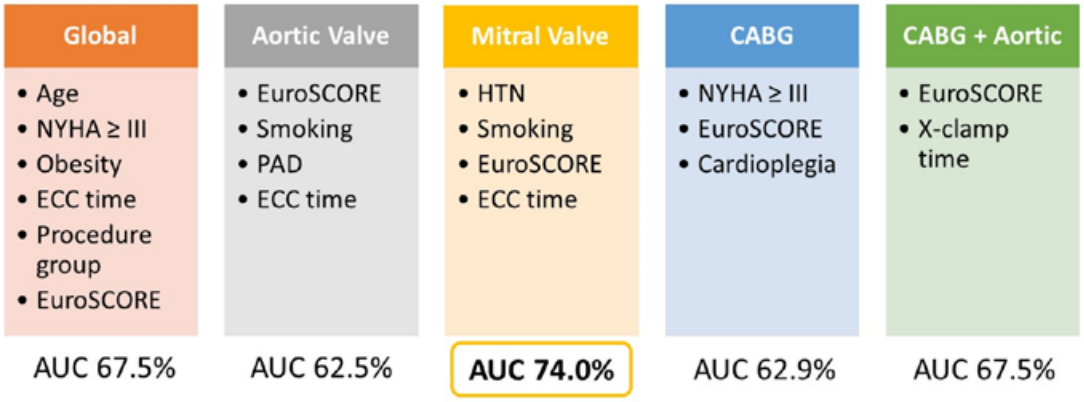
Results: We created 5 models using perioperative variables for prediction of PoAF. The models show variable predictive capacities, using different variables: global sample with AUC 67.5%, aortic valve model with AUC 62.5%, CABG model with AUC 62.9% and CABG and aortic valve model with AUC 67.5%. The mitral valve model, with the highest discriminative power – AUC 74%, includes hypertension, smoking, EuroSCORE I and extracorporeal circulation time as variables. All the models show good discriminative capacities. Patients with PoAF had higher mortality during the first postoperative year (8.40% vs. 4.68%, $p<0.001$), and a longer stay in the intensive care unit (3.0 ± 3.8 vs. 2.0 ± 2.2, $p<0.001$) and in the hospital (9.5 ± 6.8 vs. 7.6 ± 6.6, $p<0.001$). Incidence of stroke was not significantly higher in patients with PoAF (1.42% vs. 0.98%, $p=0.309$). Acute kidney injury (7.67% vs. 2.75%, $p<0.001$) and prolonged ventilation time (10.80% vs. 3.73%, $p<0.001$) were more frequent in patients with PoAF.

Conclusion: It is possible to create a model with a good predictive capacity for mitral valve surgery. PoAF is strongly associated increased morbidity and mortality and prolonged ICU and hospital stays.

	ALL PATIENTS			AORTIC VALVE			MITRAL VALVE		
	S	PoAF	p	S	PoAF	p	S	PoAF	p
DEATH @ 1Y (%)	4.68	8.40	**<0.001**	4.73	10.03	**0.001**	4.43	3.77	0.838
AKI (%)	2.66	7.60	**<0.001**	1.87	10.073	**<0.001**	3.16	7.55	0.172
VENTILATION >48H (%)	3.66	9.60	**<0.001**	3.05	7.12	**0.001**	4.43	5.66	0.715
ICU STAY (DAYS)	2.0 ± 2.2	3.0 ± 3.8	**<0.001**	2.0 ± 1.8	2.9 ± 4.0	**<0.001**	1.8 ± 1.0	2.6 ± 2.4	**0.001**
TOTAL STAY (DAYS)	7.6 ± 6.6	9.5 ± 6.8	**<0.001**	7.8 ± 6.4	9.6 ± 6.1	**<0.001**	7.3 ± 5.5	9.2 ± 4.4	**0.026**

	CABG			CABG + AORTIC VALVE		
	S	PoAF	p	S	PoAF	p
DEATH @ 1Y (%)	3.88	7.49	**0.007**	8.36	6.85	0.672
AKI (%)	2.62	3.37	0.485	5.09	5.48	0.894
VENTILATION >48H (%)	2.91	9.74	**<0.001**	6.91	15.07	**0.027**
ICU STAY (DAYS)	2.0 ± 2.1	2.6 ± 2.9	**<0.001**	2.4 ± 3.8	3.3 ± 2.8	0.069
TOTAL STAY (DAYS)	7.2 ± 6.7	9.0 ± 7.5	**<0.001**	8.7 ± 6.7	9.7± 6.6	0.181

S – sinus rhythm



CC05-27074

CORONARY ARTERY BYPASS SURGERY WITH HYPOTHERMIC VENTRICULAR FIBRILLATION WITHOUT AORTIC OCCLUSION: A CONTEMPORARY STUDY ON THE EARLY RESULTS AND LONG-TERM SURVIVAL

Carlos Branco (Portugal)[1,2]; Filipe Soares (Portugal)[1,2]; Pedro Correia (Portugal)[1,2]; André Antunes (Portugal)[1,2]; Gonçalo Freitas Coutinho (Portugal)[1,2]; David Prieto (Portugal)[1,2]; Manuel J Antunes (Portugal)[2,3]; Pedro E Antunes (Portugal)[1,2]

1 - Cardiothoracic Surgery - University Hospital, Coimbra;
2 - Faculty of Medicine, University of Coimbra;
3 - Emeritus Professor, Faculty of Medicine, University of Coimbra

Purpose: There is little information in the recent literature on the results of patients undergoing coronary artery bypass grafting (CABG) surgery with hypothermic ventricular fibrillation without aortic occlusion. We analyzed the early results and the long-term survival in a contemporary series of patients submitted to CABG surgery performed under this technique.

Methods: Patients were identified and the preoperative, operative, and postoperative data retrieved from our institutional prospective CABG registry. From this database, the records of 4,912 consecutive patients submitted to isolated CABG with hypothermic ventricular fibrillation without aortic occlusion from January 2000 to December 2013 were retrieved for analysis Mean age was 63.2±9.5 years, 13%(638) were women, 29.9%(1467) diabetic, 10.3%(508) had peripheral vascular disease, 8.8%(431) had cerebrovascular disease and 50.4%(2,475) had previous acute myocardial infarction (AMI). Three-vessel disease was present in 76.3%(3,747) of the cases and 8.5%(414) had left ventricle ejection fraction <40%. Patient survival was calculated by actuarial analysis according to the Kaplan–Meier method.

Results: The mean cardiopulmonary bypass time was 53.6±16.7min. The mean number of grafts per patient was 2.7±0.7 (arterial: 1.2±0.5). The left internal thoracic artery (ITA) was used in 99.6%(4,893) of patients and both ITAs in 21.8%(1071). The in-hospital and thirty-day mortality rate was 0.5%(24) and 0.6%(27), respectively. Inotropic support was required in 6.1%(299) and mechanical support in 0.6%(31), and 1.5%(74) were re-explored for bleeding and 0.6%(31) for sternal complications (mediastinitis, 0.3%). Acute kidney injury occurred in 962 patients (19.7%). The incidence rates of stroke/transient ischemic attack and AMI were 2.4 and 1.5%, respectively. The mean hospital stay was 7.0±4.4 days. Follow-up was 36,498 patient-years (median 7.8 years), and complete for 95.9% of patients. Late survival rates at 1, 5, and 10 years were 97.1±0.2, 92.2±0.4 and 80.1±0.7%, respectively.

Conclusions: In this contemporary series, we demonstrate that hypothermic ventricular fibrillation without aortic occlusion afford good early and long-term survival results in patients undergoing isolated CABG. This method is simple and expeditious and remains a very useful alternative technique of myocardial protection, which should be known to every surgeon who performs coronary surgery.

CC06-27099

SURGICAL MYECTOMY FOR HYPERTROFIC OBSTRUCTIVE CARDIOMYOPATHY: A SINGLE-CENTRE EXPERIENCE

André Antunes (Portugal)[1,2]; David Prieto (Portugal)[1,2]; Gonçalo Coutinho (Portugal)[1,2]; Manuel Antunes (Portugal)[3]; Pedro Antunes (Portugal)[1,2]

1 - Cardiothoracic Surgery Centre, University Hospital, Coimbra;
2 - Faculty of Medicine, University of Coimbra;
3 - Emeritus Professor, Faculty of Medicine, University of Coimbra

Introduction: Septal myectomy is the gold standard treatment for hypertrophic obstructive cardiomyopathy. This study aimed to evaluate the results from patients with hypertrophic obstructive cardiomyopathy who underwent to septal myectomy at our institution.

Methods: A retrospective study was performed evaluating all consecutive 15 patients with hypertrophic obstructive cardiomyopathy who underwent septal myectomy at our institution from January 2000 to October 2019. All patients were submmited to septal myectomy by transaortic approach. Were excluded all patients with concomitant aortic valve repair or replacement.

Results: The mean age was 54 years (19-76) and 66.6% were male. Most of the patients were in NYHA class III/IV preoperatively (86.6%). There were no need to mitral subvalvular apparatus procedures. The mean ICU stay was 2 days (1-4) and the mean in-hospital stay was 6 days. Six patients (40%) needed inotropic support. There was no intra-operative mortality neither in-hospital mortality. The mean resting left ventricular outflow tract gradients reduced from 81.5+/-24.4 mmHg preoperatively to 19.8+/-8.9 mmHg at discharge. There were 2 patients with conduction disorders and 1 needed pacemaker implantation. There were no iatrogenic ventricular septal defects. Fourteen patients (93.3%) attended the most recent follow-up assessments, and all were categorised as NYHA class I or II. The mean long-term survival rate after septal myectomy was 95.7%.

Conclusion: At our centre, septal myectomy is associated with low operative and early mortality rates, a low risk of early adverse events, and good clinical and haemodynamic outcomes.

CC07-26035
DAVID V PROCEDURE: A SINGLE CENTER EXPERIENCE

Jorge Pinheiro Santos (Portugal)[1]; Rui Rodrigues (Portugal)[1]; Álvaro Laranjeira Santos (Portugal)[1]; José Fragata (Portugal)[1]

1 - Hospital de Santa Marta, CHULC

Introduction: In 1988, Tyrone David introduced a procedure for replacement of the aortic root sparing the aortic valve and reimplanting the coronary ostia. The entire root and annulus are enclosed in graft material, preventing dilation over time. Patients benefit from the long-term durability associated with preservation of the native valve and freedom from anticoagulation. Different series from around the world show that the results of the David operation have been excellent.
Aim: To study the outcomes of patients submitted to the David V procedure in our center.
Materials and Methods: We studied patients from January 2013 to December of 2018 that were admitted to our service to be submitted to David procedure. We searched medical records for sociodemographic data, echocardiogram and computed tomography data.
Results: During this period 19 patients were submitted to the David procedure in our service. 79% were male and mean age was 41.9 ± 20.1 years. Median NYHA class at diagnosis was 2 (1;2). 42.1% of patients were hypertense and 31.6% of patients had a conjunctive tissue disease (Marfan syndrome (n=5) and Loeys-Dietz syndrome (n=1)). 3 patients had previous operations. Mean EuroSCORE II was 2.9 ± 1.6. 63.2% of patients had moderate to severe aortic regurgitation, mean diameter of Valsalva sinuses was 52.7 ± 7.0 mm and ascending aorta diameter was 40.5 ± 12.0 mm. In the postoperative period, the most common complications were definitive pacemaker implantation (10.5%) and atrial fibrillation (10.5%), mean thoracic drainage was 733.5 ± 235.3 mL. During follow-up, 95% of patients had minimal or mild aortic regurgitation. One patient had to be reoperated due to endocarditis with pseudoaneurysm of the aortic root.
Conclusion: David procedure, despite its inherent complexity, shows good results and is reproductible.

CC08-27069
COMBINED AORTIC VALVE AND CORONARY REVASCULARIZATION SURGERY IN OCTOGENARIAN PATIENTS

André Soeiro (Portugal)[1]; Gonçalo F. Coutinho (Portugal)[1]; Carlos Branco (Portugal)[1]; João Cardoso (Portugal)[1]; Pedro E. Antunes (Portugal)[1]

1 - Centro Hospitalar da Universidade de Coimbra - Serviço de Cirurgia Cardiotorácica e Transplantação de Órgãos Torácicos

Introduction: Aortic valve disease is the most common indication for heart surgery, particularly in older patients. In those patients, it is frequent the association with coronary disease. We aim at evaluate the population of octogenarian patients who have undergone concomitant aortic valve replacement surgery (AVR) and coronary revascularization (CABG) in our department.
Methods: From Oct/2010 to Dec/2018, 106 patients with age ≥80 years were, consecutively, submitted to concomitant AVR-CABG. Patients with other valvular procedures were excluded. Mean follow-up was 4,5±2,5 years and follow-up was completed in 100% of the patients. The study population was compared to the general population (age and gender-matched, 1-sample log-rank test).
Results: Mean age of the patients was 82±1,7 years [range 80-88], 65,1% were male, 26,4% were diabetic and 86,8% had chronic kidney disease. Ten per cent of patients had history of stroke and 6,6% had chronic obstructive lung disease, 37,7% were in NYHA class III-IV and 19,8% were class III-IV of CSS. Mean Euroscore II was 5,36±3,5% [range 1,73-16,54]. Left internal mammary artery graft was used in 64,2% of the patients and 72,6% had severe aortic stenosis. Half the patients had postoperative acute kidney injury, 28,3% had supraventricular dysrhythmia and 2,83% had postoperative disabling stroke. Thirty-day mortality was 1,89%. Survival at 1st and 5th years was 91,5% and 73,6%, respectively. The incidence of major adverse cardio and cerebrovascular events (MACCEs) 5 years was 33.1%. When compared to general population the surgery did not restore the life-expectancy in this group of patients (p=0.005).
Discussion/Conclusion: Our data suggests that combined AVR+CABG can be performed safely and with a very low postoperative mortality in octogenarians. The incidence of MACCEs at 5 years was also low. Although survival at 5 years was good, when compared to age and gender-matched Portuguese general population, surgery did not restore the expected life-expectancy.

CC09-26052

HEARTMATE 3- SEEMS TO BE A GOOD THERAPY IN LOW INTERMACS PROFILE PATIENTS

Vítor Mendes (Switzerland)[1]; Cândido Cerca (Switzerland)[1]; François Verdy (Switzerland)[1]; Anna Nowacka (Switzerland)[1]; Matthias Kirsch (Switzerland)[1]

1 - Centre Hospitalier et Universitaire du Vaudois- Lausanne

Introduction: Mechanical circulatory support with Heartmate 3 has become a mainstay option for the expanding population of patients with advanced stage heart failure.
In addition to increasing survival, the majority of Heartmate 3 patients experience substantial improvement in functional status.
Objectives: Evaluate safety and results in a three years Heartmate 3 implantation Program.
Methods: This study included 30 patients with chronic end-stage heart failure, who received Heartmate 3 device. We did a review of the demographic, clinical and surgical data, and we analysed the adverse events during mechanical circulatory support and the overall survival using the Kaplan-Meier method.
Results: Heartmate 3 was implanted in 27 male patients (90 %) with 56±12.7 years old and a body surface 2.0±0.24 m2. The baseline hemodynamic data showed left ventricular ejection fraction of 20.7±6.1 %, corresponding to 2.2±0.39 l/ min/ m2 of cardiac index.
Ischemic cardiomyopathy was the most common aetiology in this chronic heart failure population (n=20; 67 %); 94% were INTERMACS I-IV according to the pré-implant clinical Profile.
The implantation of Heartmate 3 was performed under cardiopulmonary bypass (74± 22.8 min); aortic cross clamping was needed in two patients (29±33.1 min) for a concomitant procedure (aortic valve replacement).
Adverse event rates included right ventricular dysfunction requiring temporary mechanical support (20%); bleeding requiring surgical review (30%); gastrointestinal bleeding (13.3%); specific VAD infection (30%); ischemic stroke (13.3%); Haemorrhagic stroke (post-traumatic) (3.3%) and renal dysfunction requiring dialysis (6.7%).
During the follow-up, 12 patients (40%) were transplanted and 3 died (10%). Using the Kaplan Meier method, we calculated an overall survival rate of 88.7±6.2 %, stable from 12 months after implantation.
Discussion and conclusion: Previously reported outcomes and adverse event rates at 12 months are maintained at 3 years. The survival rate of 88 % at 3 years with Heartmate 3 support mostly exceeds that from other recent trails. During the three years of follow-up, results show, as expected, an acceptable survival with low adverse event rates, which proves the efficacy of this therapy in patients with INTERMACS profiles lower than 4.

CC10-26057

CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH ADVANCED LEFT VENTRICULAR DYSFUNCTION: ELECTIVE VS URGENT PROCEDURES

Tiago Pinto Silva (Portugal)[1]; Carolina Rodrigues (Portugal)[1]; Manuela Silva (Portugal)[1]; Pedro Coelho (Portugal)[1]; José Fragata (Portugal)[1]

1 - Centro Hospitalar Lisboa Central - Hospital Santa Marta, Cardiothoracic Department

Introduction: The prevalence of patients with severe left ventricle dysfunction (LVD) being submitted to coronary artery bypass grafting (CABG) is increasing. Preoperative LVD is an established risk factor for early and late mortality after revascularization. The purpose of this study was to assess the impact of LVD on clinical outcomes, 1-year mortality and rate of complications.
Methods: Retrospective analysis of 87 patients who underwent revascularization either by on-pump or off-pump CABG, between January 2011 and November 2017. All patients had poor left ventricle function (LVF) defined by ejection fraction <30%.
Results: The patients' average age was 65,4±11,8 years and 89% of them were male. About 71,3% had prior myocardium infarction and 58,6% were on NYHA III/IV. The median logistic EuroSCORE was 12,5%. In our study, 45 patients were submitted to conventional CABG (51,7%) and 42 patients had off-pump CABG (48,3%). Two groups were analysed: 69 (79,3%) were elective patients and 18 (20,7%) patients were submitted to an urgent/emergent procedure, 3 of them emergent. The most common cardiac complications on both groups were the need for inotropic support longer than 48 hours (30,4% vs 77,8%), need of intra-aortic balloon pump (21,7% vs 77,8%) and a new onset of atrial fibrillation (21,7% vs 44,4%). The mean ICU stay was 2,71±2,7 vs 7,4±7,9 days and the total length of stay 11,1±7,3 vs 13±13,5 days. In-hospital mortality (30 days) was 8,7% vs 27,8%, one-year mortality 20,9% vs 41,2% and three-year mortality 40,4% vs 50%.
Conclusions: Patients with poor LVF who underwent CABG have a higher surgical risk. Those submitted to urgent/emergent procedures had a worse postoperative course compared to elective ones. In our study, overall one-year survival was 72,5% (80,6% vs 58,8%).

CC11-27080

EARLY AND MIDTERM OUTCOMES FOLLOWING AORTIC VALVE REPLACEMENT WITH MECHANICAL VERSUS BIOPROSTHETIC VALVES IN PATIENTS AGED 50 TO 70 YEARS

Rafael Rocha (Portugal)[1]; Rui J. Cerqueira (Portugal)[1,2]; Francisca Saraiva (Portugal)[1]; Soraia Moreira (Portugal)[1,2]; Jorge Almeida (Portugal)[1,2]; Mário J. Amorim (Portugal)[1,2]; Paulo Pinho (Portugal)[1,2]; André Lourenço (Portugal)[1,3]; Adelino Leite-Moreira (Portugal)[1,2]

1 - Cardiovascular R&D Unit, Department of Surgery and Physiology, Faculty of Medicine, University of Porto;
2 - Department of Cardiothoracic Surgery, Centro Hospitalar Universitário São João;
3 - Department of Anesthesiology, Centro Hospitalar Universitário São João

Introduction: The choice of the best prosthetic valve for each patient is a recurring and controversial question in cardiac surgery, especially in the 50-70 year old age-group, in which European and American guidelines differ.
Objectives: To compare 7-year survival and freedom from reoperation, as well as early clinical and haemodynamic outcomes, after surgical aortic valve replacement (SAVR) with mechanical or bioprosthetic valves in patients aged 50-70 years.
Methods: We performed a single-center retrospective cohort study including all adults aged 50-70 years who underwent SAVR in 2012 with a mechanical or Freedom Solo®, Trifecta® or Perimount® bioprosthetic valves. Pre-, Peri- and Post-operative data, including EuroScoreII, follow-up echocardiogram performed at 3 (2-5) months and need of reoperation were obtained from patient and national records. Median follow-up was 7 years. Univariable analyses were performed using Kaplan-Meier curves and Log-Rank tests for survival and freedom from reoperation analyses. A Logistic Regression and a Cox Regression, both adjusted for EuroScoreII, were done to estimate the effect of prosthesis type on hospital mortality and late mortality, respectively.
Results: Of a total of 193 patients, 76 (39.4%) received mechanical valves and 117 (60.6%) received bioprosthetic valves. The former were significantly younger (59.5 [62-68] vs 66 years [55-63], p<0.001), and had a higher prevalence of Atrial Fibrillation (AF) (32% vs 13.8%), p=0,003). Furthermore, they were more likely to undergo concurrent interventions on other valves (31.6% vs 12%, p=0.001), but less likely to undergo simultaneous CABG (19.7% vs 33.3%, p=0.04). The median EuroScoreII was higher in the mechanical group (2.52% vs 1.95%, p=0.06), as was early mortality (2.6% vs 7.9%). After adjusting for EuroScoreII, we did not find a significant difference in early mortality (OR=2.32 [0.515-10.496], p=0.272) or in 7-year survival (HR=0.427 [0.157-1.162], p=0.096). Freedom from reoperation at 7 years was higher in the mechanical group (100% vs 95.5%, Log-Rank=0.076). Regarding haemodynamic performance at follow-up echocardiogram, there were no differences in mean transprosthesis gradient (14.15mmHg in the Mechanical group vs 13 mmHg in the Bioprosthesis group, p=0.115) or severe Patient-Prosthesis Mismatch (4.6% vs 5.1%, p=0.888). However, reverse remodelling was not as pronounced (-14% vs -21%, p=0.036).
Conclusion: Mechanical and bioprosthetic aortic valves prostheses were comparable in terms of mid-term survival and early haemodynamic performance, in the 50-70 age group. Further prospective and larger studies are needed to provide evidence-based recommendations on this topic.

Friday, November 22th, 6:00 p.m.

SHORT COMMUNICATIONS

CC12-26041

PREOPERATIVE HEMOGLOBIN LEVELS AND TRANSFUSION RATES AFTER PBM IMPLEMENTATION IN CARDIAC SURGERY

Diana Castro Paupério (Portugal)[1]; João Pedro Monteiro (Portugal)[1]; Sara Costa (Portugal)[1]; Inês Morais (Portugal)[1]; Henrique Coelho (Portugal)[1]; Helena Gomes (Portugal)[1]; Nelson Paulo (Portugal)[1]; Diana Fonte Boa (Portugal)[1]; Manuela Vieira (Portugal)[1]

1 - Centro Hospitalar de Vila Nova de Gaia/Espinho EPE

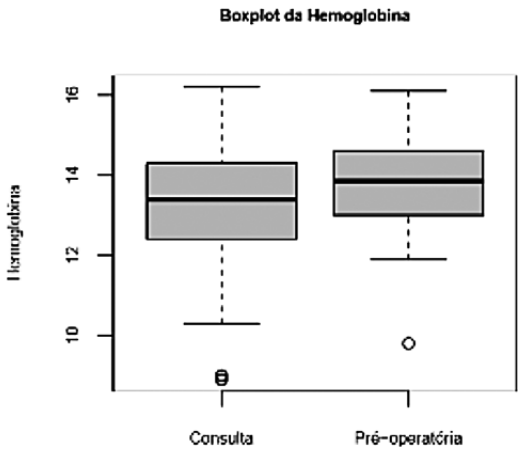
Background: Anemia can contribute negatively to a patient's morbidity and mortality. Patient Blood Management (PBM) is a patient-centered transdisciplinary approach designed to maintain the patient's blood mass and is associated with better patient outcomes, reduced transfusion rates, and costs. This study assesses the impact of the implementation of a PBM Program in cardiac surgery on hemoglobin levels on the day of surgery and the transfusion rate of red blood cells.
Methods: Between February of 2018 and January 2019, we designed a PBM program suitable for patients submitted to elective cardiac surgery in our institution. Seven different medical specialties, including primary care physicians, were involved, and we also needed to include informatics, nutrition, and nurses in the project. After the implementation

of a three pillars PBM approach regarding preoperative, intraoperative and postoperative periods we analyzed clinical, analytical and transfusion data of patients enrolled in the first five months of our PBM program and compared them with patients submitted to surgery before the implementation of PBM.

Results: Between 17.01.2019 and 17.06.2019 255 patients were submitted to elective cardiac surgery. A comprehensive PBM approach was possible in 75 patients. Preoperative anemia and iron deficiency were found in 38,7% of patients, and they were treated with IV iron (34,5%), IV iron and erythropoietin (55,2%), folic acid (6,9%) and vitamin B12 (3,5%). In this group of patients, hemoglobin distribution in the preassessment anesthesia consultation is statistically different from hemoglobin distribution on the day of surgery (Fig. 1). Cardiac bypass was necessary for 76 % of the patients. Tranexamic acid was used in 65% of patients. The transfusion rate of red blood cells in the PBM group was 21,7% in contrast with transfusion rates above 35% seen before PBM implementation. Restrictive transfusion thresholds were not fully adopted, and they had the potential to reduce the transfusion rate to 6,5%. Length of stay in ICU and ward was significantly lower in patients not submitted to transfusion of RBC.

Conclusions: Patient Blood Management implementation addressing all three pillars were associated with higher preoperative hemoglobin levels and a significant reduction in the transfusion of RBC with the potential of a more substantial decrease by adopting restrictive transfusional strategies.

Hg	Doentes	Observações	Media	SD	Mediana
Consulta	75	69	13.2	1.84	13.4
Pré-operatória	75	50	13.8	1.25	13.8



A distribuição da hemoglobina na consulta é estatisticamente diferente da distribuição da hemoglobina pré-operatória (p-value do Wilcoxon test = 0.003).

CC13-27096

PENETRATING ULCER DISTAL TO ENDOVASCULAR PROSTHESIS: A NEW ENTITY?

António Cruz Tomás (Portugal)[1]; Álvaro Laranjeira Santos (Portugal)[1]; Jorge Pinheiro Santos (Portugal)[1]; Daniela Varela-Afonso (Portugal)[1]; José Fragata (Portugal)[1]

1 - Hospital de Santa Marta

Introduction: The treatment of complex pathology of the thoracic aorta has become widespread in recent years, due to the multiple strategies available that provide good results combined with low morbidity and mortality. For a good surgical outcome, both in Frozen Elephant Trunk (FET) and Thoracic Endovascular Aortic Repair (TEVAR) surgery, preoperative study is crucial in assessing both the proximal and distal landing zone (Lz) to choose the most adequate site for the prosthesis deployment and thus to avoid potential complications.

Objective: Review all patients undergoing FET and/or TEVAR surgery at our Department and identify those in which during their follow-up new lesions were identified distally to the treated segment.

Material and Methods: From November 2007 to October 2019, 80 TEVAR and 54 FET were performed to 126 patients at our Department. All patients underwent their first postoperative computed tomography angiography (CTA) within 30 days of surgery and follow-up consisted of presential or telephone appointments and annual imaging control.

Results: During this period, 2 patients (1.6%) developed a new penetrating ulcer immediately distal to the treated segment. In the first patient this occurred distally to the endovascular component of the FET at 24 months postoperatively (Figure 1). On the second patient, who was submitted to a FET + TEVAR, it occurred at 6 months postoperatively (Figure 2). Both patients were successfully treated with a new TEVAR that completely excluded the lesion. There was no in-hospital mortality. The only complication recorded was a femoral access complication in one patient. Throughout the remaining follow-up, no EL nor new distal lesions were detected in these patients.

Conclusion: Hybrid and endovascular surgery are procedures that require rigorous clinical and imaging follow-up for early detection of de novo lesions, which, although rare, are potentially fatal. Preoperative study and planning should take into account the angulation of the aorta immediately after the distal Lz, where blood flow directed towards to this angle may exert greater pressure on the vessel wall and induce a new injury.

CC14-27089

OUTCOMES AFTER ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY REPAIR: A SINGLE-CENTRE EXPERIENCE

André Antunes (Portugal)[1,2]; David Prieto (Portugal)[1,2]; Gonçalo Coutinho (Portugal)[1,2]; Manuel Antunes (Portugal)[3]; Pedro Antunes (Portugal)[1,2]

1 - Cardiothoracic Surgery Centre, University Hospital, Coimbra;
2 - Faculty of Medicine, University of Coimbra;
3 - Emeritus Professor, Faculty of Medicine, University of Coimbra

Introduction: An anomalous left coronary artery from pulmonary artery (ALCAPA) is a very rare congenital anomaly with an incidence of 1 in 300 000 live births, which corresponds to 0.25-0.5% of all congenital heart disease.
Methods: A retrospective study was performed evaluating all consecutive patients who underwent surgical repair of ALCAPA at our institution. All preoperative and postoperative echocardiographic reports were reviewed, focusing on the recovery of left ventricular (LV) and mitral valve (MV) function.
Results: The study included 5 patients with median age at repair around 12 years (8 months to 48 years). Three were infantile-type of ALCAPA with moderate depression of LV function and moderate to severe MV regurgitation submitted to coronary transfer, and two were adult-type of ALCAPA with mild depression of LV function and mild MV regurgitation treated by closure of ALCAPA and CABG with LIMA to LAD. There were no concomitante MV repair. There were no 30-day mortality neither late mortality. The mean ejection fraction of LV improved from 41% to 61%, with the most remarkable change taking place in the first year, and, in all cases, MV function improved significantly. The mean hospital-stay was 5 days and the mean follow-up was 5.2 years.
Conclusions: Following ALCAPA repair, LV function significantly improved, regardless of age at the time of repair. In addition, preoperative functional MV regurgitation decreased over time, without concomitant mitral valve surgery.

CC15-26046

POSTOPERATIVE STROKE IN CARDIAC SURGERY

Manuela Silva (Portugal)[1]; Carolina Rodrigues (Portugal)[1]; Tiago Silva (Portugal)[1]; Rui Cerejo (Portugal)[1]; Pedro Coelho (Portugal)[1]; Nuno Banazol (Portugal)[1]; Luís Miranda (Portugal)[1]; José Fragata (Portugal)[1]

1 - Hospital Santa Marta, Centro Hospitalar Lisboa Central

Introduction: Neurological adverse events following cardiac surgery are some of the most worrisome complications, with increased morbidity and mortality. Stroke negatively impacts recovery, quality of life and costs.
Objectives: We aim to study our center cohort of patients with neurological complications and analyse outcomes.
Methods: Single center, retrospective study of 4153 adult patients who underwent aortic valve replacement (AVR), coronary artery bypass grafting (CABG) and combined procedures (AVR + CABG), between January 2008 and March 2017. Two groups (STROKE vs. NO STROKE) were compared.
Results: Overall incidence of stroke was 1,66% (n=69). AVR was performed in 1613 patients, 2160 patients underwent CABG and 380 had AVR+CABG, with stroke rate of 1,92%, 1,34% and 2,37%, respectively. The two groups, STROKE (n=69) and NO STROKE (n=4084), had similar baseline characteristics, except for older age (>70 years), higher incidence of arterial hypertension, diabetes, atrial fibrillation and cerebrovascular disease in STROKE group (p<0,05). Neurological adverse events were associated with renal dysfunction, prolonged invasive mechanical ventilation (>24 hours), need for inotropic support over 48 hours, perioperative myocardial infarction, intra-aortic balloon pump, cardiac

	STROKE (n=69)	NO STROKE (n=4084)	p value <0,05
Age(years), mean **>70years**	73, 4 ±7,9 52 (75)	68,2 ±10,8 2063(50)	✓
Male gender (%)	39(57)	2715(66)	
Arterial Hypertension (%)	66 (96)	3514(86)	✓
Diabetes (%)	32(46)	1414(34)	✓
Hyperlipidemia (%)	55(80)	3112(76)	
Smoking history (%)	22 (32)	1473(36)	
Previous atrial fibrilation (%)	9 (14)	298(7)	✓
Myocardialinfarction (%)	25 (36)	1570(38)	
CongestiveHeart failure(%)	26 (38)	1607(39)	
Chronic lung disease(%)	3 (4)	308(8)	
Renal disease(%)	4(6)	150(4)	
Cerebrovascular disease (%)	4 (6)	228(6)	✓
Peripheral vasculardisease (%)	7 (10)	172(4)	
Previous cardiac surgery (%)	5 (7)	148(4)	
CPB time >120minutes (%)	19 (28)	559(14)	

arrest, postoperative atrial fibrillation and need for temporary or definitive pacemaker (p<0,05). Overall in-hospital mortality was 2,31%; STROKE group had significantly higher in-hospital mortality (18,84% vs. 2,03% p<0,05).
Conclusions: Postoperative stroke in cardiac surgery is a devastating complication. Overall incidence in our study was similar to other series published in the literature. A higher morbidity and a significant higher in-hospital mortality were associated with stroke.

CC16-26040
WHICH FACTORS CAN INFLUENCE QUALITY OF LIFE IN THE FIRST POSTOPERATIVE YEAR AFTER CARDIAC SURGERY?

Jorge Pinheiro Santos (Portugal)[1]; Pedro Coelho (Portugal)[1]; José Fragata (Portugal)[1]

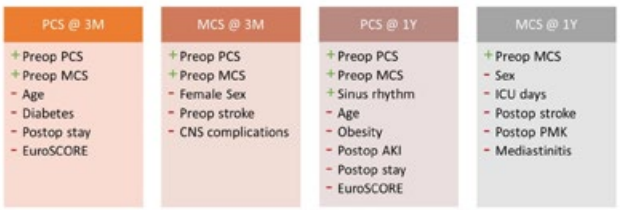
1 - Hospital de Santa Marta, CHULC

Introduction: Due to improvements in cardiac surgery and decreasing mortality, not only survival but also quality of life after surgery has become a main endpoint in cardiac surgery.
Aim: evaluate the quality of life after cardiac surgery during the first postoperative year in elective patients.
Methods: Retrospective study with data from patients operated between January 2011 and December 2017, elective and those operated on the same-admission after diagnosis. Patients were divided patients into groups depending on surgical procedure.
Data was collected on demographics, comorbidities, diagnosis, procedure and complications. SF-36 Health Survey was used to evaluate quality of life and calculated the scores for each of the 8 health domains and psychometrically-based physical component summary (PCS) and mental component summary (MCS) scores.
We performed Kolmogorov–Smirnov test, Friedman ANOVA and multiple comparison and Mann–Whitney U test and multiple linear regression.
Results: In this period, 3577 patients were operated in our department: 2258 elective and 1319 operated on the same-admission after diagnosis. Elective patients were divided into 5 groups: valvular surgery (n=1125), CABG (n=629), CABG and valvular surgery (n=155), aortic procedures (n=98) and miscellaneous procedures (n=251). Overall mortality was 3.5%.
Elective patients showed significant improvement in all 8 quality of life dimensions 3 months after surgery. At 1 year, all dimensions, except for mental health, also improved significantly. Postoperative PCS and MCS at 3 and 12 months were significantly influenced by preoperative PCS (p<0.001) and MCS (p<0.001). Patients with higher EuroSCORE I, older and with longer length of stay had significantly worse PCS at 3 (p<0.001) and 12 months (p<0.001) postoperatively. Female patients had significantly worse MCS at 3 (p=0.01) and 12 months (p=0.004). There was no significant difference in quality of life in patients submitted to different procedures.
Elective patients had better PCS at 1 year when compared with patients operated on the same-admission after diagnosis [57.1 (55.3, 58.1) vs. 56.9 (55.0, 58.1), p = 0.013]. PCS and MCS at 3 months were similar.
Conclusion: QoL improves during the postoperative period in all patients. Worse physical and mental preoperative state and complications are associated with worse quality of life. Elective patients have better quality of life after cardiac surgery, when compared to previously admitted patients.

Variation in SF-36 dimensions at 3 months and 1 year

	Preop	3M	p (PO - 3M)	1Y	p (3M - 1Y)
Physical function	50 (25-70)	80 (55-90)	**0.001**	85 (55-95)	**0.001**
Role physical	44 (25-69)	75 (50-94)	**0.001**	75 (63-100)	**0.001**
Bodily pain	60 (41-94)	94 (74-100)	**0.001**	100 (74-100)	**0.001**
General health	50 (40-62)	62 (52-72)	**0.001**	62 (52-72)	**0.011**
Vitality	44 (25-56)	69 (56-81)	**0.001**	69 (56-81)	**0.001**
Social function	75 (50-100)	100 (75-100)	**0.001**	100 (68-100)	**0.006**
Role emotional	58 (33-92)	100 (75-100)	**0.001**	100 (75-100)	**0.001**
Mental health	55 (45-70)	70 (60-75)	**0.001**	70 (60-75)	0.138

Factors associated positively and negatively with QoL at 3M and 1Y (p<0.05)



CC17-27070
CONTRIBUTION OF THE TRANSCRANIAL DOPPLER IN THE PREVENTION OF MICROEMBOLISM DURING CARDIOPULMUNARY BYPASS

Hélder Santos (Portugal)[1]; Marina Silva (Portugal)[2]; Catarina Lopes (Portugal)[3]

1 - Escola Superior de Tecnologia da Saúde de Coimbra - IPC;
2 - Hospital Distrital da Figueira da Foz;
3 - Cirurgia Cardiotoracica do Centro Hospitalar e Universitário de Coimbra

Introduction: Despite the technology evolution and the various safety systems, the production and passage of

microemboli remains the cause of post-CPB neuropsychological lesions.
Objectives: Detection of the passage of microemboli during CPB and what to do to minimize their occurrence.
Materials and Methods: The study was conducted in patients with cardiac pathology using open heart surgery. A transcranial Doppler was used for continuous and simultaneous monitoring of the middle cerebral arteries (right and left) during cardiac surgery using two transducers (2 MHz) and supported by cranial fixation system. We recorded the stages of surgery where the most microemboli occurred, and tried to understand the reason for their passage.
Results: Microembolism passage was detected in the following phases: anesthetic induction, aortic and ventricular cannulation, bypass onset, aortic clamping, aortic unclamping, onset of ventricular contraction.
Conclusions: Despite all available mechanisms, much can be done to prevent microembolization. With these results we intend to sensitize the professionals involved by alerting to the importance of using bubble filters,
greater care in cannulation and purging techniques, complete filling of the heart, aspiration of the cardiac cavities at the beginning of contraction, and during the exit of bypass, rise and fall of flow slowly. We believe that small procedures and greater attention to intraoperative maneuvers minimize potential neuro-cognitive damage.

CC18-26051
SURGICAL CORRECTION OF AORTIC COARCTATION IN NEONATES AND INFANTS: A SINGLE CENTER ANALYSIS OF THE LAST 20 YEARS

Carolina Rodrigues (Portugal)[1]; Rui Cerejo (Portugal)[1]; Manuela Silva (Portugal)[1]; Rui Rodrigues (Portugal)[1]; Conceição Trigo (Portugal)[1]; José Fragata (Portugal)[1]

1 - Hospital de Santa Marta

Objectives: The goal of this study was to review the results of surgical correction of aortic coarctation in neonates and infants, taking into consideration that there is still controversy concerning the ideal surgical repair technique.
Methods: This is a retrospective single center study. Our entire series of 82 children under the age of 12 months undergoing repair between January 1998 and December 2018 was reviewed.
Results: Regarding age of operation, 62%(n=51) were neonates and 38%(n=31) were infants (ages between 29 days and 1 year). Fifty three percent of patients (n=44) had a simple coarctation and 47%(n=38) had complex coarctation with additional intracardiac anomalies, namely, ventricular septal defect (n=22), Shone's syndrome (n=11), aortic arch hypoplasia (n=6), aortic valve stenosis (n=6) and great arteries transposition (n=4). Forty two percent (n=42) were repaired with a subclavian flap operation, 28%(n=23) with resection and end-to-end anastomosis, 10%(n=8) with extended end-to-end anastomosis and 11%(n=9) with other repair techniques (e.g. patch and reversed flap). Mean time of follow-up is 73 months. Peri-operative mortality (30 days) was 4,8% (n = 4) while overall mortality was 9,7% (n =8). Sixteen patients needed reintervention because of recoarctation, 13 were treated with balloon dilatation, while 3 had to be reoperated. Rate of reintervention because or recoarctation was 12% (n=5) with subclavian flap and 35%(n=8) with end-to-end anastomosis.
Conclusions: Perioperative mortality occurred in 4 patients, all with complex coarctation. Reoperation for recoarctation occurred in 16 patients (19%). Rate of reintervention because or recoarctation was higher with end-to-end anastomosis technique.

CC19-26049
TEN YEARS OF EXTENDED MYECTOMY FOR THE TREATMENT OF HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY – DOES SEX MATTER?

José Máximo (Portugal)[1,2]; Armando Abreu (Portugal)[1,2]; Paulo Pinho (Portugal)[1,2]; Jorge Casanova (Portugal)[1,2]

1 - Serviço de Cirurgia Cardiotorácica, Centro Hospitalar e Universitário de S. João, Porto, Portugal;
2 - Serviço de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto, Porto, Portugal

Introduction: Hypertrophic obstructive cardiomyopathy (HOCM) is a hereditary condition affecting the heart and surgery plays a major role in its treatment. Gender differences in clinical presentation and treatment outcomes are currently in debate. Our aim is to describe the population of HOCM patients in whom extended myectomy was performed in our tertiary care facility, between 2009 and 2019, and characterize sex differences before and after surgical treatment.
Methods: The data was collected from the clinical records (n = 33), in all patients with a main operative diagnosis of HOCM in the last 10 years. Pre-operative demographics, clinical and diagnostic work-up information, intraoperative variables and post-operative outcomes were collected. Statistical analysis was performed using the SPSS software (v24.0).
Results: No intraoperative deaths were registered; hospital mortality was 3% (one patient died due to arrhythmia)

and three deaths occurred during a median follow up time of 4.5 years (two cardiac and one respiratory in nature). Median time until hospital discharge was 8 days. From the 33 patients included in the analysis, 14 were male and 19 females. Female patients are older (p=0.05) and more symptomatic (greater proportion of patients in New York Heart Association [NYHA] functional classes III or IV; p=0.003) than male patients at the time of surgery; their pre-operative study showed higher left atrium dimension (p=0.002) and interventricular septum thickness (p=0.028) to body surface ratio and a higher incidence of atrial fibrillation (p=0.027). During surgery, although extracorporeal circulation and aortic cross-clamp times did not differ significantly, females required more blood transfusions (p=0.046). After surgery, interventricular septum and left ventricle outflow tract gradient reductions are similar between genders, but transition to lower NYHA classes is significant for females (p=0.003), but not for male patients. Although survival curves seem to diverge, this was not statistically significant.
Conclusions: Female patients seem to be in worse clinical condition upon presentation to surgery and show markers of more advanced disease. Nevertheless, after surgery, females presented greater functional improvement. We need to focus on a more comprehensive approach in patient preoperative study and increase the sensitivity for disease diagnosis in earlier stages in the female population.

CC20-27064
NIGHTMARES IN SAPHENOUS HARVEST VEINS IN CARDIAC SURGERY

Elisa López (Portugal)[1]; Viviana Gonçalves (Portugal)[1]

1 - Centro Hospitalar Universitário São João

Introduction: In coronary artery bypass grafting (CABG) the saphenous harvest vein continues to be used frequently, even with all scientific development. Today, the most important matter is the patient, and improving his recovery is the aim of the team and for that we need to offer the best skills with the best techniques. For the saphenous harvest vein, we perform two techniques: open and minimal incisions.
Aim: Improve the recovery of the patient with the best technique of saphenous harvest vein without complications.
Method: We realise that the open technique, that could be easier, brings more post-operation complications. In the other side, we have the minimal incisions, which technique we perform too, and the healing results are better than the results of the open technique.
Results / Discussion: Infection of saphanectomy is the most usual complication and, with that, the length of stay will be extended, spend more hours in treatments, antibiotics, decreasing the quality of life of the patients and them families, with big economic and social impact. Not long time ago, complications of saphanectomy could become a disaster, even ending in amputations. These complications are more often in the open technique, because the surface for healing is bigger than the minimal incisions. The results tell us that the minimal incisions should be more frequently use rather than the open technique, being even more important in patients with risk factors, like diabetes, peripheral venous insufficiency, obesity.
Conclusion: Today, our intervention should be in the prevention of complications, but when that is not possible, we can treat the complications sooner and with good results with Negative Pressure Wound Therapy (NPWT), which allows that patient recovery could be as short as possible. We should be aware to the risk factors and improve the results with Incisional Negative Pressure Wound Therapy when the patient has some of them, in both techniques. The minimal incisions technique allows the patient recovery more quickly, with less pain at post-operation, more quality of life and even with a better functional scar.

CC21-27068
MINIMALLY INVASIVE APPROACH FOR CONCOMITANT AORTIC AND MITRAL VALVE SURGERY

Daniel Martins (Portugal)[1]; Sara Costa (Portugal)[1]; João Monteiro (Portugal)[1]

1 - Centro Hospitalar Vila Nova de Gaia/Espinho

Valve surgery through a median sternotomy has been the standard approach, but in the past decade various minimally invasive approaches have gained increasing acceptance.
Few experiences exist in minimally invasive cardiac surgery for the treatment of double-valve disease. Most data available on minimally invasive valve surgery has generally involved single valve surgery. For patients undergoing combined aortic and mitral valve surgery, a minimally invasive approach, performed via a right lateral thoracotomy, is possible. This method is safe and effective and leads to an enhanced recovery in our patients given the reduction in surgical trauma. We report our incial experience, describing surgical technique and post-operative results.

CC22-27100

LEVOSIMENDAN IN CARDIAC SURGERY OUR EXPERIENCE

Carlos Pinto (Portugal)[1]; Luis Vouga (Portugal)[1]

1 - CHVNGE

Introduction: Levosimendan has been used, with good clinical results, in cases of low output syndrome, with low left ventricle ejection fraction (LVEF), in heart failure. Based in this results, it has been proposed, with the same indications, in cardiac surgery, with excellent results in some series. Randomized trials, did not found the same clinical advantage. Our objective is to present our experience, using levosimendan in cardiac surgery, during a ten year period. The objective was to observe the impact of the drug in terms of morbidity and mortality (30-day and hospital).

Methods: Demographic, clinical, ecocardiographic, surgical and morbi-mortality data, of patients submitted to cardiac surgery in whom levosimendan was used, during the period between jan.2009 and dec.2018, were retrospectively collected.

Results and discussion: A total of 246 patients were considered eligible for this study. 62% were male, with a mean age of 69,4 years (27-91). The collected data confirmed the high complexity of this cohort. Low LVEF was found in 52,4% of the cases, 30,5% with less than 35%, right ventricle dysfunction in 8,5% and a high NYHA class in 61%. In 10,6% of the patients, the surgical team dealt with a reoperation case. A critical pre-operatory status was presented in 15,4% and in 22,4%, of the cases the cases, surgery was emergent. Data analysis, showed that pre and peri-operatory administration of levosimendan granted protection, with a reduction in morbi-mortality. The positive effect in mortality reduction was more noticeable in patients with low LVEF, specially submitted to CABG surgery. This positive effect was lost when levosimendan is administered later in the postoperative course. No statistically significant difference was found in reduction of mechanical support, intra-aortic ballon pump, renal replacement therapy or myocardial infarction. Need for surgical haemostasis revision and mechanical support after surgery were independent factors for bad prognosis, with little impact of levosimendan administration. The intra-hospitalar mortality was 26,8% (66 patients). In the ten year period, another 19 died, all from cardiac causes.

Conclusion: The collected data point to favorable results of levosimendan in patients with low LVEF, specially when administered pre or peri-operatively. The less positive impact in morbidity of this drug, can be justified by the administration in too critical patients. It is mandatory to compare this results with a placebo population, with the same characteristics, in order to formulate definitive conclusions.

THORACIC SURGERY

SALA B - Friday, November 22th, 6:00 p.m.

ORAL COMMUNICATIONS SELECTED FOR THE EDUARDO ESTEVES PINTO AWARD

CT0126048
NON-INTUBATED UNIPORTAL VIDEO-ASSISTED THORACIC SURGERY – PRELIMINARY RESULTS IN A SINGLE INSTITUTION

Joana Rei (Portugal)[1]; Susana Lareiro (Portugal)[1]; Pedro Fernandes (Portugal)[1]; Catarina Celestino (Portugal)[1]; Luís Vouga (Portugal)[1]; Miguel Guerra (Portugal)[1]

1 - Centro Hospitalar Vila Nova de Gaia/Espinho, EPE

Objectives: Over the years, thoracic surgery has evolved under the premise of minimum invasiveness and maximum safety. As so, non-intubated video-assisted thoracic surgery (NIVATS) has gained relevance in the surgical field, as it overcomes the risks of orotracheal intubation and single-lung ventilation.
The main goal of this study is to evaluate the outcomes of all patients submitted to uniportal NIVATS at our institution, regarding safety, efficacy and potential benefits.
Materials and Methods: We performed a retrospective study including all cases of uniportal NIVATS performed at our department since March 2019 until August 2019. We collected patient-related data, as well as anesthetic (ASA score, anesthetic drugs, duration of anesthesia) and surgical data (procedures performed, duration of surgery). Patients were considered candidates for surgery if their BMI was <30, ASA score <IV, without cardiac comorbidities and whenever they were proposed for simple procedures.We evaluated outcomes analyzing intra-operative complications (such as conversion to orotracheal intubation) and post-operative course (duration of air leak, time until feeding, post-operative pain, inflammatory reaction, complications and length of stay).
Results: Seventeen patients were submitted to uniportal NIVATS at our center, either for the performance of surgery for pneumothorax or for lung biopsy procedures (2 cases). Patients' age ranged from 15 to 64 (mean = 31 years) and they had no significant comorbidities. Mean surgical time was of 34.59 minutes, while mean anesthetic time was of 46.47 minutes. There was no need for conversion to orotracheal intubation in any case. Mean time until feeding was of 3.47 hours, while mean maximum pain reported in the first 48 hours was of 4/10. Post-operative air leak occurred for approximately 1.46 days after surgery, with a 4-day median length of stay (LOS). Post-operative inflammatory reaction was evaluated through post-operative drainage (mean= 216.56 mL) and difference between of post and pre-operative leucocyte count (mean=1,99x10^6/mm3). Complications occurred in three cases, two with prolonged air leak and one with pneumothorax recurrence in need of re-operation.
Conclusions: Uniportal NIVATS is a safe technique that can be performed in simple procedures, for patients within a wide range of age. It does not significantly increase anesthetic time, post-operative inflammatory reaction, complications or mean LOS. The main aim of performing NIVATS in small procedures is to improve the surgical technique and further characterize potential candidates, in order to proceed into the performance of more complex surgical procedures in patients with clear risks for orotracheal intubation and selective ventilation.

CT02-26055
VATS PROGRAM FOR ANATOMICAL LUNG RESECTION - A DEPARTMENT'S EXPERIENCE

Magda Alvoeiro (Portugal)[1]; Mariana Antunes (Portugal)[1]; Cristina Rodrigues (Portugal)[1]; Samuel Mendes (Portugal)[1]; Carolina Torres (Portugal)[1]; Telma Calado (Portugal)[1]; Daniel Cabral (Portugal)[1]; Francisco Félix (Portugal)[1]

1 - Serviço de Cirurgia Torácica, Hospital Pulido Valente, CHLN

Objective: VATS is now the preferred approach for anatomic lung resection. It's been preformed since 1991 and its worldwide acceptance is undeniable. Large series analysis has proven it's safe and oncologically equivalent to open surgery when performed by experienced teams. Our department started the VATS program after establishing experience on thoracoscopic surgery for minor surgery, and has been evolving ever since. This work aims to review our performance regarding completed VATS anatomical resections, team training and evolution, diagnosis and indications.
Methods: We retrospectively reviewed the clinical records of all patients submitted to anatomical resections (bilobectomy, lobectomy and segmentectomy) from January 2012 to September 2019. We collected data considering the approach, performing surgeon, completed procedures and conversion rate. We reviewed clinical variables such as diagnosis,

presentation and staging. Three groups were established for analysis purposes: A – 2012 to 2014, B – 2015 to 2017, and C – 2018 to 2019.
Results: During the study time frame, 1202 major anatomical resections were performed, 294 by VATS. In Group A 8,7% of the resections were VATS, followed by a constant increase on the following years: Group B 26,6% and Group C 44%. When considering the last year of the study (2019) VATS approach reached 46,4%. Nine surgeons were included. Two completed >50 procedures, 1 is over 45, 2 over 25, 2 are at the beginning of the learning curve, and the remaining two left our center. Our conversion rate was 4,8%. Segmentectomies were only performed in Group C. 252 patients (86%) were lung cancer patients, clinically staged IA (25,4%), IB (51,6%), IIA/IIB (11,9%), IIIA (8,6%), one IIIB and 5 stage IV patients. Post-chemotherapy patients and higher lung cancer stages were more common in groups B and C.
Conclusion: Our department has steadily adopted VATS as a first approach to anatomical lung resection and has been extending its indications throughout time according to team experience. We've encouraged all surgeons on our team to start VATS lobectomy/segmentectomy, including residents, aiming to offer most patients what will soon be the standard of care in lung surgery.

CT03-26050
LUNG TRANSPLANTATION IN PORTUGAL – PAST, PRESENT AND FUTURE

João Santos Silva (Portugal)[1]; Costa Ana Rita (Portugal)[1]; João Eurico Reis (Portugal)[1]; Rita Barata (Portugal)[1]; Paulo Calvinho (Portugal)[1]; José Fragata (Portugal)[1]

1 - Hospital Santa Marta, CHULC

Introduction: Lung transplantation is the gold standard for end stage respiratory failure. We this paper we aim to describe the national center activity regarding short and long-term outcomes and compare it with the international literature. Our secondary goal was to compare the activity of the past 2 years with the rest, regarding volume, mortality rate and survival.
Methods: All lung transplantation cases in our institution were reviewed, from beginning of 2008 until September 2019.
Results: 248 lung transplants were performe since the beginning of the program. 100 uinilateral (40%) and 148 bilateral lung transplants (60%). Since Semptember 2017, 90 transplants were performed, from which 22 were unilateral (24%). 1-year survival was 76% for the entire population.
Conclusion: Lung transplantation is a complex procedure, but with good results in the treatment of end stage repiratory failure. Global survival in our center is similar to the one described in the literature. Outcomes in the recent years are better than global outcomes, reflecting the impact of the learning curve and volume, reflecting the trends described in other centers. The proportion of bilateral procedures will tend to rise. Future perspectives include increase the donor pool with lung recondicioned by XVIVO and use of donors in cardiac death.

SALA B - Friday, November 22th, 5:00 p.m.
ORAL COMMUNICATIONS

CT04-26037
INTRAPLEURAL FIBRINOLYSIS VS VATS IN THE MANAGEMENT OF COMPLICATED PARAPNEUMONIC PLEURAL EFFUSION OR EMPYEMA

Susana Lareiro (Portugal)[1]; Ana Rita Gigante (Portugal)[1]; Joana Rei (Portugal)[1]; Nuno China (Portugal)[1]; Pedro Fernandes (Portugal)[1]; Daniel Coutinho (Portugal)[1]; Ana Oliveira (Portugal)[1]; Carla Ribeiro (Portugal)[1]; Miguel Guerra (Portugal)[1,2]

1 - Centro Hospitalar Vila Nova de Gaia/ Espinho;
2 - Faculdade de Medicina da Universidade do Porto

Background: Parapneumonic pleural effusion (PPE) is a frequent complication of pulmonary infections. The effusion may progress with fibrin deposition, formation of septations, and pleural thickening, as the fluid evolves from turbid to purulent and, eventually allows for bacterial isolation, constituting a complicated PPE or empyema (if purulent). In these cases, pleural drainage is associated with antibiotic therapy for treatment, however, this is not always enough. There is no consensus in the literature about the best approach for the early and effective resolution of this condition.
Aims: To compare the application of intrapleural fibrinolytics to video-assisted thoracoscopic surgery (VATS) in the management of complicated PPE or empyema when conventional treatment fails.
Methods: A retrospective observational study in admitted patients, between April 2016 and May 2019, diagnosed with complicated PPE or empyema with an unsatisfactory response to antibiotic therapy and pleural drainage was conducted. Two groups were defined according to the subsequent treatment: one group of 13 patients who received intrapleural instillation of alteplase and dornase alfa in addition to pleural drainage and intrapleural saline washes, and another of 12 patients undergoing VATS for debridement and/or pleural decortication. Demographic data, effusion characteristics, pre-procedure antibiotic time, efficacy and

complications of the procedure, duration of a chest drainage, length of stay, mortality, and readmissions were recorded.

Results

	Intrapleural fibrinolysis n=13	VATS n=12	*p*-value
Age, years	56[52-63]	56[41-65.5]	0.758
Gender (male)	11(84.6)	8(66.7)	0.378
Effusion size**			
1	0(0)	0(0)	
2	2(15.4)	1(8.3)	0.09
3	9(69.2)	2(16.7)	
4	2(15.4)	9(75)	
Turbid or purulent pleural fluid	10(76.9)	7(63.6)	0.659
Loculations	13(100)	12(100)	1.00
Positive pleural culture	1(7.7)	2(16.7)	0.593
Duration of antibiotic therapy before intervention, days	11[6-18]	11.5[7-21.5]	0.682
Duration of a chest drain placed before intervention, days	4[3-7]	8[4-12]	0.190
Complications	4(30.8)	2(16.7)	
Mild bleeding	1	0	
Severe bleeding/ anaemia requiring transfusion support	2	1	0.645
Subcutaneous emphysema	1	1	
Duration of a chest drain placed, days	6[5-8]	5[4.5-6.5]	0.383
Total length of stay, days	26[16-32]	22[17.5-26]	0.574
Length of stay after intervention, days	10.5[8-22]	8[6.5-12]	0.164
Inpatient mortality	0	0	1.00
Readmission at 3 months	0	1(8.3)	1.00
Radiological alterations >3 months	3(30)	7(58.3)	0.179

Data are presented as n(%) or median [range];*p<0.05 **Effusion size scale: 1-costophrenic angle obscured; 2-entire diaphragm obscured; 3-up to hilum; 4-above hilum

Conclusions: No procedure was superior in efficacy, complications, length of stay or safety for the treatment of complicated PPE or empyema.

CT06-27077
LAPAROSCOPIC AND THORACOSCOPIC APPROACH OF POS-TRAUMATIC DIAPHRAGMATIC HERNIA

Raquel Pereira (Portugal)[1]; Aline Gomes (Portugal)[1]; João Freitas (Portugal)[2]; Carlos Casimiro (Portugal)[1]

1 - Cirurgia Geral, Centro Hospitalar Tondela-Viseu;
2 - Cirurgia Torácica, Centro Hospitalar Tondela-Viseu

Introduction: Diaphragmatic injuries following thoraco-abdominal trauma are rare (1,1-3,9%) and often difficult to diagnose. These lesions can manifest years later as chronic diaphragmatic hernias. Due to a high risk of life-threatening complications, such as volvulus or incarceration, surgery is the first-line treatment option. The authors present a clinical case about the surgical treatment approaches for chronic traumatic diaphragmatic hernia.

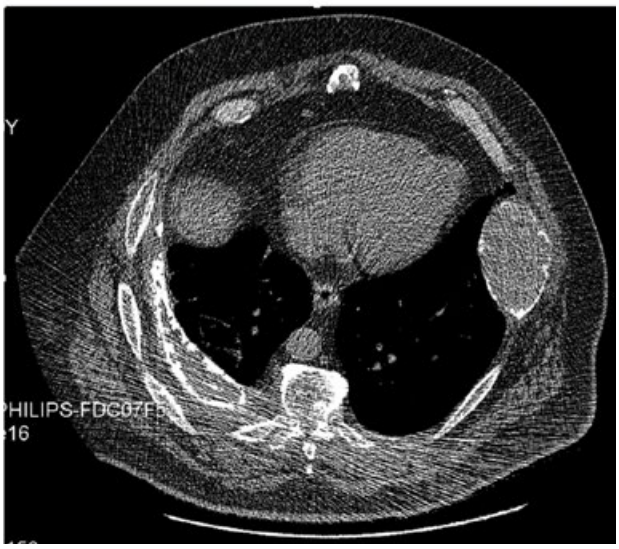
Materials & methods: The clinical case involves a 66 year old male patient that was in a car accident two years ago suffering blunt chest trauma (seven fractured ribs and hemopneumothorax that required drainage). The patient had been asymptomatic until recently when he started having abdominal and thoracic pain on the left side. The chest CT scan revealed a left diaphragmatic hernia with omental herniation. The surgical procedure involved a laparoscopic and thoracoscopic approach with hernia reduction, lysis of adhesions in pleural cavity, thoracic drainage and frenoplicature. There were no complications on the pos-op period and the patient was discharged on the 2nd day.
Conclusion: Chronic diaphragmatic hernias can be treated by laparoscopic or thoracoscopic approach. Isolated thoracoscopic approach can be difficult especially in the presence of pulmonary adhesions. The combination of both approaches reduces the risk of intraoperative complications.

CT07-27101
A RIB OSTEOSARCOMA – BEYOND THE MASS, THE CHALLENGING PATIENT

Mariana Antunes (Portugal)[1]; Cristina Rodrigues (Portugal)[1]; Rita Araújo (Portugal)[2]; Fernanda Paula (Portugal)[3]; Filipe Froes (Portugal)[3]; Júlio Semedo (Portugal)[4]; Daniel Cabral (Portugal)[1]; Magda Alvoeiro (Portugal)[1]; Telma Calado (Portugal)[1]; Carolina Torres (Portugal)[1]; Samuel Mendes (Portugal)[1]; Francisco Félix (Portugal)[1]

1 - Serviço de Cirurgia Torácica, Hospital Pulido Valente, CHLN, Portugal;
2 - Serviço de Anestesiologia, Hospital Pulido Valente, CHLN, Portugal;
3 - Unidade de Cuidados Intensivos Médico-Cirúrgicos Respiratórios - Hospital Pulido Valente, CHLN, Portugal;
4 - Serviço de Pneumologia, Hospital Pulido Valente, CHLN, Portugal

Introduction: Most primary osteosarcoma arises in long bones of children and young adults. 10-15% of malignant chest wall tumors are osteosarcomas and most often originate in the rib, scapula and clavicle.
Methods: We report a case of primary osteosarcoma of the rib in an adult male with morbid obesity.
Case presentation: Male patient, 50 years old, non-smoker. Medical history: morbid obesity (198kg, sleeve gastrectomy in 2015), High blood pressure, Type 2 Diabetes Mellitus with poor metabolic control, Obstructive sleep apnea syndrome (using BiPAP) and an episode of deep vein thrombosis.
Incidental finding of a litic mass, with periferic calcifications, originated from the lateral portion of seventh left rib and fibrothorax with pleural calcifications at the right lung. On physical exam there was no palpable mass on the left chest. Thoracoabdominal CT and PET-Scan showed



only the mass (with metabolic uptake SUV 17,4), without metastasis. CT-guided core needle biopsy revealed an osteosarcoma.

After the patient was intubated under conscient sedation by fiberoptic broncoscopy, we performed a segmental resection including the sixth, seventh and eighth left ribs with parcial serratus anterior muscle and reconstruction with polypropylene mesh. Without any intraoperative complication, he was admitted at our ICU and extubated on day 1. Initial postoperative period required high flow oxygen therapy during the day and nocturnal non-invasive ventilation. The chest tube was removed on the seventh postoperative day and he was discharged home the day after.

Conclusions: Primary osteosarcoma of the chest wall is rare in the thorax. Improved survival is related with R0 resection.

We present a case representing a surgical and medical challenge, the required cooperation of a team of professionals that managed to offer the best treatment, without complications.

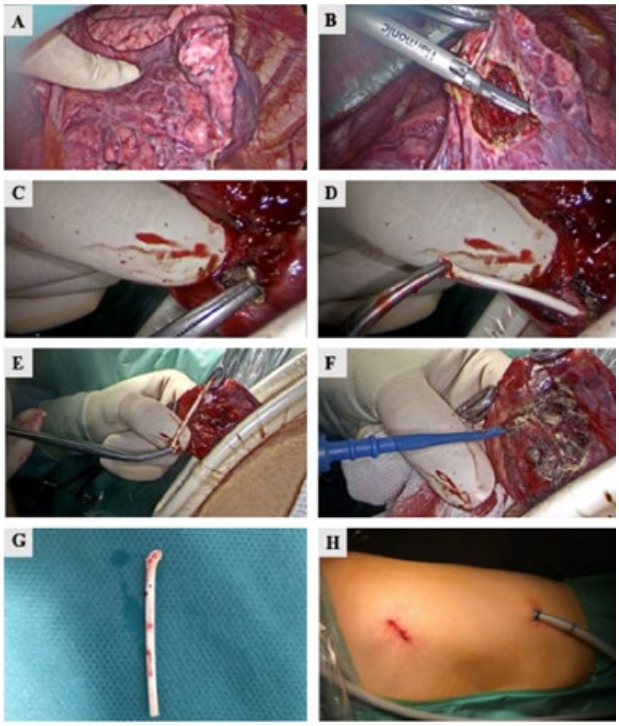
CT08-26027

EMBOLIZATION OF IMPLANON DEVICES - FIRST CASE REPORT OF LUNG SPARING VATS

Sara Lopes (Portugal)[1]; Rita Costa (Portugal)[1]; João Maciel (Portugal)[1]; Paulo Pinho (Portugal)[1]

1 - Centro Hospitalar e Universitário São João, Porto, Portugal

Subdermal contraceptive implants are an effective option of family planning. Implanon NXT ® is a single-rod long acting subdermal hormonal contraceptive implant (68 mg of etonogestrel), measuring 4 cm in length and 2 mm in diameter. Migration or even embolization are possible, being advisable percutaneous or surgical retrieval. When device cannot be detected by palpation, a radiography can locate it, because barium is one of its components. We report the first case of a subdermal contraceptive device removal from a segmental pulmonary artery by videoassisted thoracic surgery without lung resection.



CT09-26059
PANCOAST TUMOUR WITH SPINE INVASION - CASE REPORT

Daniel Cabral (Portugal)[1]; Cristina Rodrigues (Portugal)[1]; Carolina Torres (Portugal)[1]; Wilson Teixeira (Portugal)[2]; Sérgio Livraghi (Portugal)[2]; Mariana Antunes (Portugal)[1]; Samuel Mendes (Portugal)[1]; Magda Alvoeiro (Portugal)[1]; Telma Calado (Portugal)[1]; Francisco Félix (Portugal)[1]

1 - Serviço Cirurgia Torácica, CHULN;
2 - Serviço de Neurocirurgia, CHULN

Case Report: We report the case of a 66 year-old male, former heavy smoker. He mentioned the presence of cough and left ptosis and miosis in the previous six months. Chest CT showed a 6 cm long-axis mass in the left upper lobe, invading the first and second ribs and the vertebral body of D2, with increased uptake on FDG-PET. There were no further uptake locations. The diagnosis was obtained by fiberoptic bronchoscopy. Pathology revealed a squamous cell carcinoma (PDL1> 50%). The case was discussed at a multidisciplinary meeting, including the neurosurgery team, and neoadjuvant chemotherapy (vinorelbine/cysplatine) plus neoadjuvant radiotherapy (50Gy) was decided. Five weeks later the patient was admitted to the hospital for a joint surgical procedure between thoracic surgeons and neurosurgeons. The intervention was divided into four parts. In the first one, the patient was positioned in ventral decubitus and cervico-dorsal arthrodesis was performed. After that, a left upper lobectomy and anterior section of the first three ribs and posterior disarticulation of the first and third ribs were made. Then, D1-D2 and D2-D3 discectomy took place, allowing the en bloc resection of the full specimen, including the vertebral body of D2. In the last part the patient underwent mediastinal lymphadenectomy and hemostasis control. He stayed in the ICU for eleven days, being discharged after twenty five days. Pathology analysis of the specimen confirmed squamous cell carcinoma with free margins. TNM 8th edition: ypT4N0. Currently, four months after surgery, the patient is being treated with immunotherapy due to disease progression in the right acetabulum, which was also irradiated (20Gy).
Discussion: Pancoast tumours represent less than 5% of all lung cancers. They are defined as tumours that arise from the upper lobe and invade the thoracic inlet. Clinical features depend on the involved structures. For many years invasion of the spine was considered unresectable and fatal. Due to the progress in spine surgery, en bloc resection including the spine is nowadays possible. Furthermore, some case series reported 57% and 43% of overall survival at three years and five years after surgery, respectively. As performed in our case, trimodality treatment based on induction chemoradiotherapy followed by surgery became the standard treatment. A complete R0 resection, which was achieved in our patient, is one of the major outcome determinants.
Conclusions: Patients which are candidates for surgical resection should be highly selected and multimodality and multidisplinary approach is mandatory.

CT10-26039
''SUGAR TUMOR'': CASE REPORT OF A RARE DIAGNOSIS

Rita Afonso Costa (Portugal)[1]; Sara Lopes (Portugal)[1]; João Maciel (Portugal)[1]; Paulo Pinho (Portugal)[1]

1 - Department of Cardiothoracic Surgery, University Hospital Center of São João, EPE, Porto, Portugal

A 36-year-old male, welder, previously healthy, reported insomnia, caused by dyspnea, dysphagia and permanent chest oppression to his physician. No other symptoms, including fever, weight loss or nocturnal hypersudoresis, were present.
In the initial study, an enlargement of the mediastinum was apparent in anteroposterior X-ray. Subsequently, a chest CT scan revealed a regular mass in the posterior mediastinum, measuring 56x56x86mm, pushing the carina and compressing of the main bronchus and esophagus. Transthoracic biopsy, which was inconclusive, ruled out the hypothesis of a lymphoproliferative tumor, paraganglioma or carcinoma. Magnetic resonance showed a 10x8.8x6.5 cm mass in the posterior mediastinum, with no involvement of adjacent structures, but in close apposition with the descending thoracic aorta and the terminal portion of the aortic arch, from the level left subclavian artery, involving less than 180º of its circumference.
We conducted a resection of the mass, by right posterolateral thoracotomy. Although closely related to the surrounding structures, it was possible to find a dissection, except with the descending aorta. No vascular tumor pedicle was found.
Anatomo-pathological analysis revealed multifocal expression in HMB45 and MelanA, in the absence of expression of protein S100, SOX10, CAM5.2, chromogranin, synaptophysine, desmin, actin and MDM2. These characteristics are compatible with malignant perivascular epethelioid cell carcinoma (PEComa), a rare malignant tumor, especially in this location.

CT11-26058

THORACIC ENDOMETRIOSIS DIAGNOSED AFTER REPEATED SURGERY FOR RECURRENT PNEUMOTHORAX: A CASE REPORT

Rita Lopes (Portugal)[1]; Rita Pancas (Portugal)[1]; Sara Cunha (Portugal)[1]

1 - Cardiothoracic Surgery Department, University Hospitals of Coimbra, Coimbra, Portugal

Background: Thoracic Endometriosis Syndrome (TES), the presence of ectopic endometrium-like tissue in the thoracic cavity, is a rare condition which affects reproductive-age women. The presentation is variable and a chronological association with menstruation is not always recognized. The definitive diagnosis is achieved by histopathological confirmation of intrathoracic endometrial implants as well as visualization of intraoperative diaphragmatic lesions. The aim of this study is to present a case of a young female with recurrent pneumothorax associated with diaphragmatic hole and pleural endometriosis foci that was diagnosed after a first surgical treatment.
Methods: A 33-year-old nulliparous woman was admitted to the emergency department with right-sided chest pain along with shortness of breath. A thorough medical history demonstrated chronic pelvic pain, dyspareunia, dysmenorrhea and primary infertility for which she was taking ovarian stimulants in the previous month of presentation. Her history revealed that she had a similar episode three years back and she had undergone right thoracotomy apical bullectomy and pleurodesis because of a persistent air leak under chest tube. Chest radiography at the time of admission revealed a right basal hydropneumothorax.
Results: The patient was proposed for right video-assisted thoracoscopic surgery (VATS). Intraoperatively, an obvious diaphragmatic hole was found in the anteromedial portion of the central tendon of right hemidiaphragm and diaphragmatic thinning around the defect. The parietal, as well the diaphragmatic pleura, showed scattered red-brownish lesions. We performed a primary close of the diaphragmatic defect with pledget-supported polybutilate (Ethibond®) sutures. A right inferior pleurectomy with abrasive mechanical and chemical pleurodesis was also executed. Immunohistochemical tests were consistent with pleural endometriosis. Medical treatment with continuous oral contraceptives was initiated after surgery. The patient developed recurrence of pneumothorax two days after discharge managed by talc slurry pleurodesis. CT 3 moths postoperatively showed a persistent stable pneumothorax.
Conclusion: The diagnosis of TES remains challenging and should be suspected in premenopausal women presenting with a single or recurrent pneumothorax. It is important to get a comprehensive gynecological history and a precise examination of chest cavity and diaphragm surface during surgery in cases of clinical suspicion is mandatory. VATS has contributed greatly to the increased recognition and diagnosis of TES. Closure of diaphragmatic defects should be performed but still might not prevent recurrence of pneumothorax. This case may suggest TES as a progressive form of endometriosis. The tendency to recur even after surgical treatment may be a characteristic of endometriosis-related pneumothorax.

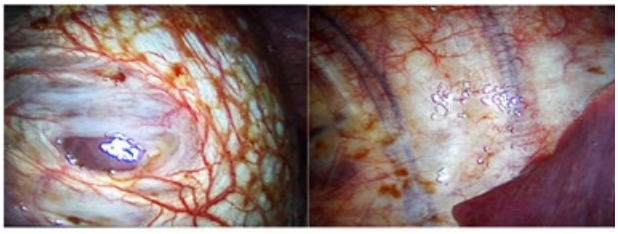


Figure 1 – Intraoperative findings: (1) Thoracoscopic view of diaphragmatic hole and endometrial implants in the central tendon of the right hemidiaphragm. (2) Parietal pleural endometriosis.

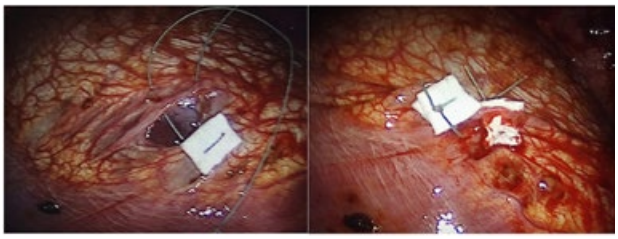


Figure 2 - Suture repair of the diaphragmatic defect.

CT12-26044

GIANT PLEURAL TUMOR AND SEVERE HYPOGLYCEMIA: DOEGE-POTTER SYNDROME IN A PREVIOUSLY HEALTHY FEMALE

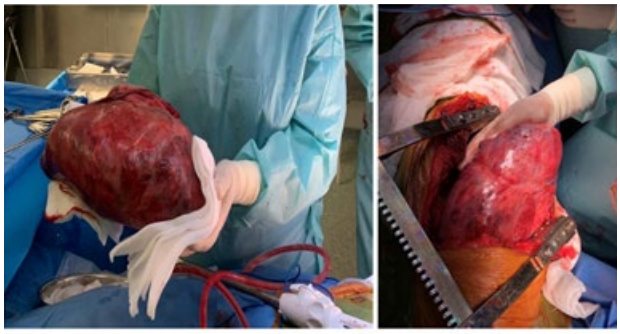
Nádia Junqueira (Portugal)[1]; João Caldeira (Portugal)[1]; Ricardo Ferreira (Portugal)[1]; Joana Silva (Portugal)[1]; Filipe Costa (Portugal)[1]; Teresa Monteiro (Portugal)[1]; Ângelo Nobre (Portugal)[1]

1 - Hospital de Santa Maria

Introduction: Doege–Potter's syndrome is a rare paraneoplastic syndrome, consisting in hypoglycemia and solitary fibrous tumor of the pleura. These tumors represent <5% of all tumors of the pleura and can only be cured by surgery. In this article, we report a case of a patient presenting with severe hypoglycemia, as the only symptom, and a mass occupying the entire left hemithorax.
Case presentation: Female patient, age 54, with severe

hypoglycemia, a chest radiograph with almost total opacification of the left hemithorax and a computed tomography scan with a mass in the left hemithorax. Surgery was performed and a mass with 30cm × 18cm × 11cm and weighed 3195g was resected. The postoperative course was uneventful with immediate resolution of the hypoglycemia. The immunohistochemistry diagnosis was solitary fibrous tumor of the pleura.

Conclusions: Solitary fibrous tumor of the pleuraare very rare. Less than 5% are associated with hypoglycemia, taking the form of Doege-Potter Syndrome. Radiation therapy and chemotherapy have shown low response rate and complete surgical resection is the only procedure that offers the cure. This case reports describes a rare giant solitary fibrous tumor of the pleurawith severe hypoglycemia, successfully treated by surgery. Long-term follow-up of the patient after the surgery is necessary for detection of any possible recurrence.



VASCULAR SURGERY

SALA C - Saturday, November 23th, 2:30 p.m.

ORAL COMMUNICATIONS SELECTED FOR THE JOSÉ CID DOS SANTOS AWARD

CV01-27103

PHLEGMASIA CERULEA DOLENS: A NOWADAY PERSPECTIVE ON A VASCULAR CATASTROPHE

Pedro Lima (Portugal)[1]; Mário Moreira (Portugal)[1]; Mafalda Correia (Portugal)[1]; Bárbara Pereira (Portugal)[1]; Joana Silva (Portugal)[1]; Vânia Constâncio (Portugal)[1]; Anabela Gonçalves (Portugal)[1]; Manuel Fonseca (Portugal)[1]

1 - Centro Hospitalar Universitário de Coimbra

Introduction: Phlegmasia cerulea dolens (PCD) is the most serious reversible presentation of a deep vein thrombosis (DVT), which can lead to limb loss and death. Due to its low incidence, the knowledge regarding the natural history and possible therapies is limited.

The authors present a systematic review in order to gather data to ease analysis on the progression of PCD and (dis) advantages of the diverse therapeutic approaches.

Methods: The databases PubMed and Embase were searched in a 40-year period, excluding non-related papers or single-case reports. Additionally, the authors collected the first 10 elements listed on each selected article bibliography. A total of 7 articles were included, all written in a case series fashion. The collected data concerning demographics, natural history, treatment approaches and follow up were analysed.

Results: From the 7 articles included, comprising a total of 54 patients, the median age was 55,8 years (min. 26; max. 83). The reported risk factors were diverse, but neoplasms were the most frequent. PCD was more oftenly seen in left lower limbs. Doppler ultrasound (DUS) was the tool used in most cases to diagnose PCD. All patients had an iliofemoral DVT occluding the common femoral vein.

The chosen therapies were surgical or endovascular thrombectomy, thrombolysis, angioplasty or a combination of

these. The use of Vena Cava filters varied according to each institution protocol.
The median follow up was 10.7 months and the reported outcomes were heterogeneous. Eight patients died, 4 were submitted to amputation and 11 patients had post-thrombotic syndrome.
Conclusions: Despite the collected data derived from case series with a broad diversity of reported outcomes, we noticed an evolution in the approach to patients with PCD. This study does not make up to the fact that the different strategies used in each case series related to patients at different points of a severity spectrum, which seems to be the leading prognostic factor.
However, different surgical and endovascular strategies are described that can efficiently reduce clot burden and prevent or reduce the ominous outcomes attached to this condition.

CV02-26063
DIAGNOSTIC VALUE OF CEREBRAL OXIMETRY IN DETECTING NEUROLOGIC COMPLICACTIONS DURING CAROTID ENDARTERECTOMY

Juliana Pereira-Macedo (Portugal)[1]; João Rocha-Neves (Portugal)[2,3,4]; André Leite-Moreira (Portugal)[1,5]; José P. Andrade (Portugal)[3]

1 - Faculdade de Medicina da Universidade do Porto;
2 - Departamento de Angiologia e Cirurgia Vascular;
3 - Departamento de Biomedicina - Unidade de Anatomia, Faculdade de Medicina da Universidade do Porto;
4 - Departamento de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto;
5 - Centro Hospitalar de São João

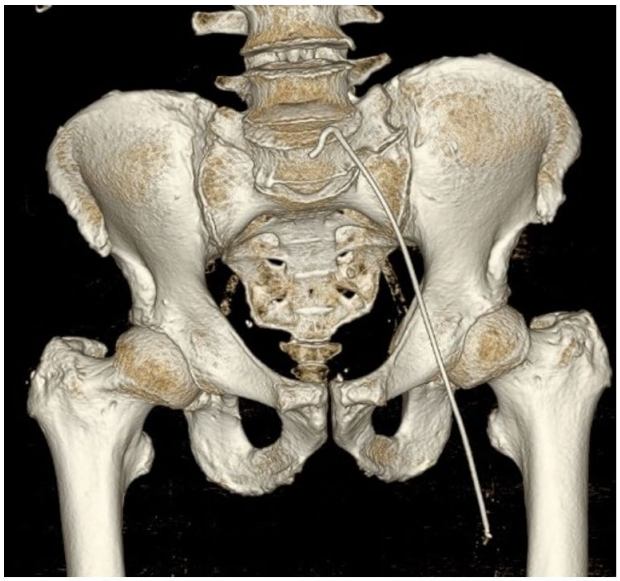
Introduction: Carotid endarterectomy (CEA) is still the gold-standard to treat patients with carotid artery stenosis (CAS). Nonetheless, peri-procedural risks mainly intra-operatory cerebral hypoperfusion and/or stroke may occur following carotid artery cross-clamping. Near Infrared Spectroscopy has been established as a simple, non-invasive and real-time method of regional oxygen saturation (rSO2) measurement during CEA
Objective: This study aims to evaluate the feasibility of the INVOS cerebral oximeter in detecting cerebral hypoperfusion during CEA under loco-regional anaesthesia (LA).
Methods: From January 2009 to January, 2018, 62 consecutive patients from a tertiary and referral center, who underwent CEA with LA were retrospectively gathered. Cerebral topography was assured by double examination and all patients were subjected to INVOS cerebral oximetry with initial neurologic evaluation and subsequent surveillance every 5 minutes. For data assessment, univariate analysis were performed. Subsequently, operating characteristic curve and Cohen's kappa coefficient were determined to evaluate the reliability of the monitoring test.
Results: ROC curve analysis demonstrated that a drop of at least 20% in rSO2 is the best threshold to infer about cerebral hypoperfusion. However, the respective AUC was 0.6 (95%CI 0.463-0.753, P = 0.158) with a calculated Cohen's kappa of 0.177, P = 0.08. Regarding 30-days outcomes, only awake testing has shown significant associations with stroke and major adverse outcomes (P = 0.012 and P = 0.036), that were higher in patients with neurologic deficits.
Conclusion: INVOS cerebral oximeter is not a reliable predictor of critical cerebral hypoperfusion during CEA under LA. Actual gold-standard of monitoring cerebral perfusion while the patient is awake has demonstrated better feasibility and its association during the surgery is recommended.

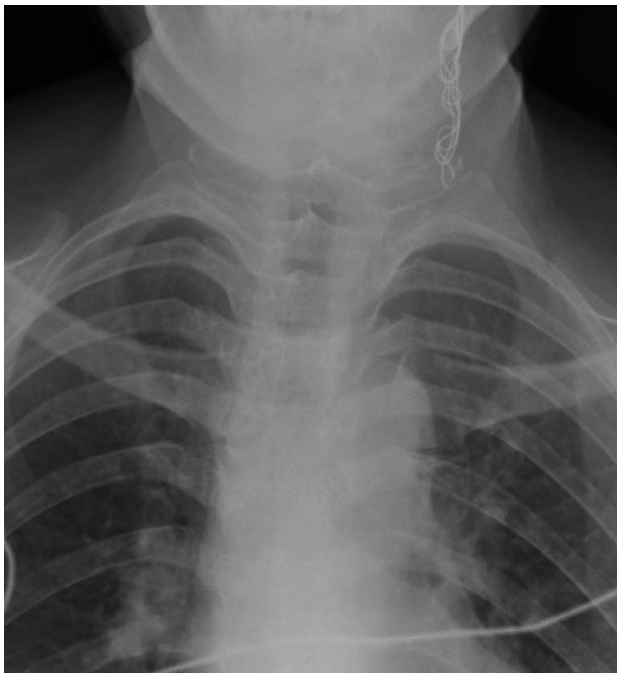
CV03-27075
INTRAVASCULAR FOREIGN BODY RETRIEVAL - THE ROLE OF OPEN AND ENDOVASCULAR PROCEDURES

Ricardo Correia (Portugal)[1]; Ana Garcia (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Rita Bento (Portugal)[1]; Fábio Pais (Portugal)[1]; Isabel Vieira (Portugal)[1]; Rita Garcia (Portugal)[1]; Frederico Gonçalves (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

1 - Hospital de Santa Marta, CHULC

Introduction: Intravascular foreign body (IFB) embolization is a potential complication of any vascular procedure. It is increasing as endovascular procedures become ubiquitous. Most often, IFB are guidewires, fragmented catheters, lost stents or coils. Intravascular foreign body retrieval (IFBR) can be achieved using percutaneous techniques, open surgery or both combined.
Methods: We completed a retrospective review of patients who underwent endovascular or open IFBR between 2011 and 2019 in our institution. We evaluated the cause, management, and outcomes of IFB misplacement. Primary end-point was retrieval technical success and secondary end-points were procedure related complications and 30-days survival.
Results: 23 patients underwent IFBR. Median time from intravascular device lost and retrieval was 1 day. 26% were endovascular devices (sheaths or catheter fragments, stents or coils). Most often, authors faced non-endovascular guidewires and sheaths (CVCs, hemodialysis, blood pressure monitoring, Implantofix). 61% of IFBs were lost during its deployment; 39% during their removal attempts.
44% were lost in arterial tree and 56% in veins. The most common target vessels were: superior vena cava (n=6)





and common femoral artery (n=4).
We used an endovascular procedure as a first-step in IFBR in 48% of patients and open procedure in 52%. There was a statistically significant association between target vessel and first treatment option (p<0,001). In presence of IFB on thoracic or abdominal cavity, it was always tried a first--endo approach; if IFB was present on neck or limbs, 86% were retrieved by open surgery.
Success rates were 100% for open and 82% for endovascular procedures. 2 endovascular procedures were unsuccessful: on the first, surgeon decided to switch to open procedure facing a lost internal jugular vein (IJV) guidewire after an unsuccessful snaring; on the second, it was impossible to snare a lost BMS on aorta. We used a snare on 55% of endovascular IFBR.
IFB caused 5 acute complications: 1 IJV thrombosis, 2 strokes, 3 acute limb ischemia.
There were no procedural complications related to IFBR. At 1-month, survival rate was 100%.
Discussion: Embolization of IFBs is a growing problem, which can be minimized with proper device selection, deployment and removal. When an intravascular foreign body is identified, careful planning and a working knowledge of the tools available will allow its removal in the safest and most expedient manner. In this review, open and endovascular retrieval had high success rates and minimal morbidity. However, its choice is surgeon dependent and restrained by devices availability.

CV04-27071

PROGNOSTIC EFFECT OF 5 ITEM MODIFIED FRAILTY INDEX (5 ITEM MFI) IN PATIENTS UNDERGOING CAROTID ENDARTERECTOMY WITH REGIONAL ANESTHESIA – A PROSPECTIVE STUDY

Leonardo Andrade (Portugal)[1]; João Rocha Neves (Portugal)[1,2,3]; José Teixeira (Portugal)[2]; José Paulo Andrade (Portugal)[1]

1 - Department of Biomedicine – Unity of Anatomy, Faculdade de Medicina da Universidade do Porto, Portugal;
2 - Department of Angiology and Vascular Surgery, Centro Hospitalar Universitário de São João, Porto, Portugal;
3 - Department of Surgery and Physiology, Faculdade de Medicina da Universidade do Porto, Portugal

Background: Frailty has been studied as a predictor of averse health events and poor postoperative outcomes patients undergoing surgery. Thus, the use of simple and more adapted indexes like MFI11 proved useful in assessing patients undergoing vascular surgery. However, there is little information on application in MFI5 in these patients and specially in the ones submitted to carotid endarterectomy[jn1]. The aim of this study was to validate and estimate the prognostic value of the MFI-5 on the long term survival of this population.
Methods: From January 2011 to June 2019, 184 patients from a tertiary care referral center who underwent CEA with RA for carotid artery stenosis were selected from a previous prospective cohort database. Clinical adverse events such as stroke, myocardial infarction (MI), acute heart failure (AHF), and all-cause mortality were assessed 30-days post-procedure and in the subsequent long-term surveillance period. MFI5 was applied to this population, and frailty with mortality and morbidity.
Results: The MFI 5 was not able to predict 30 day postoperative adverse events. In the long term results it was able to predict long term Miocardial infarction (P=0.000),

Acute heart failure (P=0.043), MACE (P=0.001) and Death (P=0.000) . MALE and Stroke were not associated.
Conclusion: The MFI-5 has proved to be an index capable of stratifying patients and predicting long-term outcomes. The MFI-5 provides a mean of rapidly comparing the comorbidity charge between cohorts.

CV05-27109
AMBULATORY ENDOVASCULAR PROCEDURES FOR LOWER EXTREMITY PERIPHERAL ARTERIAL DISEASE - A RETROSPECTIVE ANALYSIS

João Carvas (Portugal)[1]; José Vidoedo (Portugal)[2]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; João Almeida Pinto (Portugal)[2]

1 - General Surgery Department, Unidade Local de Saúde do Nordeste (ULSNE), Bragança;
2 - Vascular Surgery Department, Centro Hospitalar Tâmega e Sousa (CHTS), Penafiel

Objectives: Ambulatory endovascular procedures for peripheral arterial disease (PAD) are increasingly performed because of the convenience for the patient and cost-benefit. It is therefore important to analyse the efficacy and safety of these procedures.
Materials and Methods: Data was collected from a cohort of patients submitted to ambulatory endovascular procedures for PAD in a Vascular Surgery department during 2017.
Results: We analysed the clinical files of a total of 151 patients (21 inpatients). The average age was 68 years old, and 77% were male. Approximately 42% of patients were stage VI of the Leriche-Fontaine classification, and 34% stage III. Main comorbidities were hypertension (77%), dyslipidemia (72%) and diabetes mellitus (56%). A significant proportion was a smoker or ex-smoker (55%),suffered from heart disease (33%) or had a stroke history (9%). Prefered vascular access was the common femoral artery (CFA, 55%), followed by the superficial femoral artery (SFA, 23%) and humeral artery (19%). All accesses were ultrasound-guided. Most cases required only one access. In 30% of patients a vascular closing device was used (22% Proglide™, and 7% Exoseal™). Global complication rate was 8%. False aneurysm (n=3, 1.5%) and hematoma (n=2, 1.0%) were the main local complications. Peripheral complications included dissection (n=6, 3.0%), distal embolization (n=1, 0.5%), AVF (n=1, 0.5%) and arterial rupture (n=1, 0.5%). One patient died 6 days after the procedure because of an ischaemic stroke. No procedure related mortality existed.
Conclusions: Ambulatory procedures for PA are a safe and shouldbe supported. They represent a good option to reduce the burden over inpatient care in PAD. Nevertheless, complications do occur, and should be monitored and minimized in orther to selet the best suitable patients.

CV06-26026
ONSET OF NEUROLOGICAL DEFICIT DURING CAROTID CLAMPING WITH CAROTID ENDARTERECTOMY UNDER REGIONAL ANESTHESIA IS NOT A PREDICTOR OF CAROTID RESTENOSIS

José Diogo Guimarães Carneiro Vieira-Andrade (Portugal)[1]; João Manuel Palmeira Rocha-Neves (Portugal)[2]; Juliana P. Macedo (Portugal)[3]; Marina Felicidade Dias-Neto (Portugal)[2]

1 - Faculdade de Medicina da Universidade do Porto;
2 - Department of Surgery and Physiology, Faculdade de Medicina da Universidade do Porto, Portugal;
3 - Faculdade de Medicina da Universidade do Porto, Portugal Department of Angiology and Vascular Surgery, Centro Hospitalar Universitário São João, Porto, Portugal.

Background: Many awake patients undergoing carotid endarterectomy (CEA) present test clamp neurological deficits (NDs) during the procedure. Guidelines advocate tighter Doppler ultrasound (DUS) surveillance in these patients because of probable higher likelihood of hemodynamic stroke (class 1 grade C). The focus of the study is the assumption that patients with ND have a higher risk of developing a complete stroke if the ipsilateral carotid artery becomes occluded, making surveillance of restenosis in this group justifiable. The authors present their experience on restenosis in this group of patients.
Methods: Data were collected between 2009 and 2018 for patients of a university tertiary referral center who underwent CEA under regional anesthesia and developed alterations in the neurologic monitoring during internal carotid artery (ICA) test clamping. Control patients were selected as the next patient submitted to the same procedure who did not develop ND. Primary outcome was any restenosis detected by DUS between 16 and 30 months of follow-up. Clinical adverse events (stroke, myocardial infarction, acute heart failure, all-cause death) were assessed after 30 days and in the long-term surveillance period. Multivariate analysis of factors with significant associations to restenosis >50% was performed by binary logistic regression. Kaplan-Meier analysis and life tables were used to evaluate time-dependent variables.
Results: Ninety patients with ND and 94 controls were included. Those with ND had a higher prevalence of obesity, mean age and ASA scores, and a lower mean degree

of ipsilateral stenosis (p=0.032) and higher mean degree of contralateral stenosis (p=0.030). Restenosis after 2 years did not differ significantly between groups. Multivariate analysis yielded two significant associations to restenosis >50%: ipsilateral stenosis (p=0.02) and peripheral arterial disease (p=0.048). ND were not associated with restenosis (p=0.856). After a median follow-up period of 52 months, patients with ND did not have a higher incidence of stroke (p=0.869), MACE (p=0.377), or all-cause death (p=0.981) than controls. The presence of any restenosis was not associated with later stroke rate (p=0.515).

Discussion and conclusion: Cost-effective DUS surveillance after CEA requires evidence-based factors associated with restenosis and late stroke. The present study does not support the assumption that patients who presented NDs during ICA test clamping present a higher risk of developing late stroke. These patients also did not present a higher incidence of restenosis. For these reasons, tighter DUS surveillance in this group seems not justifiable. Results from other groups are required.

CV07-27097
BLOOD BIOMARKERS FOR ACUTE AORTIC DISSECTION: A SYSTEMATIC REVIEW

Filipa Jácome (Portugal)[1]; Jennifer Wingyian Huynh Wingyian Huynh (Netherlands)[3]; Jennifer Wingyian Huynh Wingyian Huynh (Portugal)[2]; Marina Dias-Neto (Portugal)[1]

1 - Hospital Universitário de São João;
2 - Amsterdam University Medical Centers, location VUmc, Amsterdam, the Netherlands;
3 - Amsterdam University Medical Centers, location VUmc, Amsterdam, the Netherlands

Introduction: Acute aortic dissection (AAD) is a highly-fatal cardiovascular pathology and prompt diagnosis and treatment are critical to decreases mortality. To distinguish AAD from other pathologies, physicians are mainly dependent on imaging techniques. Circulating biomarkers are of increasing interest because are a fast, easy, and low-cost approach for AAD diagnosis. Besides D-dimer, which has low specificity, none has been used in practice.

Aim: analyze putative biomarkers measured in blood, plasma or serum, for the diagnosis of adult patients with an acute aortic dissection to distinguish these patients from healthy individuals or patients with other pathologies.

Methods: This study followed the PRISMA guidelines. The databases Pubmed, EMBASE and Scopus were systematically searched from inception to May 2019. Prospective or retrospective cohort studies and case-control studies were included. Studies were considered if they present measurements of biomarker(s) in the blood/plasma/serum samples from patients with acute aortic dissection versus controls. Exclusion criteria were subacute or chronic dissection (that is, >14 days), if they lack of a control group, or if were animal studies, revisions or editorials.

The main outcome was the identification of biomarkers (other than D-dimers) associated with AAD, measured in blood/plasma/serum and that included a control group, where this biomarker was also measured.

Data was extracted from the articles by two investigators following a predefined protocol. A qualitative systematic review was then undertaken.

Results: Research query resulted in 1161 articles after removal of duplicates. A total of 48 full-text articles were included. Were included general blood assessment (number of white blood cells, platelets, platelet to lymphocyte ratio, neutrophil to lymphocyte ratio, high sensibility C reactive protein, uric acid level and homocysteine and folate), microRNAs, lipidomics (AFMK, Lysophosphatidylcholines and Sphingolipids, Ergothioneine and Glycerophosphocholine), extracellular matrix markers (matrix metalloproteinase, lumican, serum elastin fragment and tenascin-c, osteopontin, fibulin 1 and calponin), ischemia-associated molecules (sLOX-1, troponin T, serum heart-type fatty acid-binding, soluble ST2, ischemia-modified albumin), inflammatory molecular markers (transforming growth factor β, IL-6, TLR4, IL11, resistin), among other molecules (angiopoietin 2, endothelial progenitor cells and vascular endothelial growth factor). Most studies lack diagnostic validity such as sensibility and specificity. When present, such data was not available for the same biomarker in more than one paper (if present) precluding a pooled analysis.

Conclusion: A great heterogeneity of molecules has been studied as putative diagnostic markers of AAD. Studies of better quality are need, presenting the diagnostic validity of the molecules under analysis.

CV08-26015
MYOCARDIAL INJURY AFTER CAROTID ENDARTERECTOMY WITH REGIONAL ANESTHESIA: A PROSPECTIVE STUDY

Juliana Pereira-Macedo (Portugal)[1]; João Rocha-Neves (Portugal)[2,3,4]; Marina Dias-Neto (Portugal)[2,4]; António Neves (Portugal)[2,3,4]; José Andrade (Portugal)[3]

1 - Faculdade de Medicina da Universidade do Porto;
2 - Serviço de Angiologia e Cirurgia Vascular, Centro Hospitalar Universitário São João, Porto;
3 - Departamento de Biomedicina - Unidade de Anatomia, Faculdade de Medicina da Universidade do Porto;
4 - Departamento de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto

Introduction: Myocardial injury after noncardiac surgery (MINS) is a frequent event in patients undergoing carotid

endarterectomy (CEA) with general anesthesia with a mortality rate of up to 10% in the short term. Short and long-term risk of myocardial infarction (MI), stroke and other cardiovascular outcomes have been strongly associated with the presence of MINS.

Aim: Due to the absence of studies concerning CEA with regional anesthesia (RA), the present study aimed to evaluate the incidence of MINS in patients with RA and its prognostic value regarding related cardiovascular events or death. Influence of other likely factors in the incidence of MINS was also estimated.

Methods: From January 2009 to January 2018, 156 patients from a Portuguese tertiary care medical center who underwent CEA under RA were retrieved from a prospectively gathered database. Troponin I or high-sensitive troponin I values were systematically measured in the post-operative period. Other clinical outcomes such as stroke, MI and restenosis were also assessed for long-term periods. Survival analysis was performed.

Results: Incidence of MINS after CEA was 15.3%. Multivariate analysis confirmed MINS was strongly associated with chronic heart failure (P = 0.0002). As long-term risk, MI and major adverse cardiovascular events (MACE) were found to be associated with previously diagnosed MINS (hazard ratio (HR): 3.318, 95% CI: 0.97-13.928, Breslow: P = 0.025 and HR: 1.955, 95% CI: 1.01 – 4.132, Breslow: P = 0.046; respectively).

Conclusion: MINS is a long-term predictor of MI and MACE. Troponin assessment after CEA should be routinely monitored in patients with a cardiovascular risk superior to 5%. Further studies concerning prophylaxis and the management of MINS plus the effect of the anesthesia approach on the incidence of troponin elevation, should be carried on.

CV09-27018
MORTALITY SCORES IN SURGICAL CORRECTION OF ABDOMINAL AORTIC ANEURYSM IN RUPTURE

Filipa Jácome (Portugal)[1]; João Rocha-Neves (Portugal)[1]; Marta Ribeiro (Portugal)[2]; Sandrina Figueiredo-Braga (Portugal)[3]

1 - Hospital Universitario de São João;
2 - Escola de Medicina – Universidade do Minho;
3 - Hospital da Senhora da Oliveira de Guimarães, EPE

Introduction: Ruptured abdominal aortic aneurysm's treatment relies on the emergent referral for surgery considering preoperative prognosis. Several scores that allow the estimation of perioperative mortality of ruptured abdominal aortic aneurysm have been classically described, including the Glasgow Aneurysm Score and the Vancouver Scoring System. The clinical decision-making utility of scoring algorithms for predicting mortality after ruptured abdominal aortic aneurysm remains unknown, as they do not demonstrate sufficient discriminative power in a real population. In 2016, Weingarten et alproposed a new score based only on the preoperative clinical presentation of the patient.

Objective: Compare the prognostic validity of the Weingarten score with the Glasgow Aneurysm Score and the Vancouver Scoring System. Validation of three prognostic ruptured abdominal aortic aneurysms tools for a west Mediterranean population

Methods: A retrospective analysis of consecutive patients with ruptured abdominal aortic aneurysm surgically treated, in a peripheral and in a referral hospital between 2012 and 2016 was performed. The three scores 30 days mortality discriminative power was analysed.

Results:120 patients were included. The mean Glasgow Aneurysm Score was 98.53 ± 19.57, the Vancouver Scoring System was 3.64 ± 1.43. The Weingarten score classified 51 (43.2%) patients as stable and 67 (56.8%) as unstable. The three scores demonstrated some predictive value concerning mortality, although Glasgow Aneurysm Score demonstrated the highest area under the ROC curve (0.74) and the best discriminatory capacity for cut-off points with higher specificity. Neither of the scores demonstrated clinically useful predictive value.

Conclusions: The Weingarten score did not present as a superior prediction model of preoperative mortality in ruptured abdominal aortic aneurysm. None of the scores, even when optimized for a higher specificity, could select which patients will not benefit from surgical intervention. The Glasgow Aneurysm Score was validated for the Portuguese population.

CV10-27107
HEMATHOLOGICAL PARAMETERS AS PROGNOSTIC PREDICTORS IN CAROTID ENDARTERECTOMY

António Pereira-Neves (Portugal)[1,2]; João Rocha-Neves (Portugal)[1,2]; Luís Gamas (Portugal)[1,2]; José Oliveira-Pinto (Portugal)[1,2]; Alfredo Cerqueira (Portugal)[1]; José Teixeira (Portugal)[1]

1 - Centro Hospitalar e Universitário São João;
2 - Faculdade de Medicina da Universidade do Porto

Introduction: In the recent years, a growing interest in systemic inflammatory markers has emerged as they seem to play a pivotal role in the pathogenesis of atherosclerosis. Neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR) have been described has two of the main markers, having demonstrated prognostic ability in several areas, such as tumours, systemic lupus erythematosus,

sepsis and cardiovascular disease. The aim of this study was to evaluate the predictive value of NLR and PLR in patients who underwent carotid endarterectomy.

Methods: From January of 2009 to January of 2019, a total of 184 patients submitted to carotid endarterectomy in a tertiary hospital, were prospectively selected and included. Clinical characteristics, pre-operative blood cell counts and postoperative outcomes were analysed. Univariate analysis was performed for preoperative comorbidities and postoperative complications and longitudinal analysis was performed for clinical outcomes still occurring after 2 months after the procedure.

Results: Neither NLR or PLR showed ability to predict 30-day newly neurologic event or postoperative complications. Nonetheless, both ratios presented a statistical significance relation with major adverse cardiovascular events (MACE) and long-term survival (NLR P=0.005, HR 2.14, CI 95% 0.45-0.87 and P=0.004, HR 1.99, CI 95% 0.43-0.85, respectively; PLR P=0.019, HR -0.013, CI 95% 0.98-1 e P=0.019, HR -0.013, CI 95% 0.43-0.85, respectively). Also, to notice that the haemoglobin-platelet ratio displayed a statistical significance with restenosis >50% at 2-year follow-up (P=0.049).

Conclusion: In this study the NLR and PLR, two easily available parameters inferable from blood cell count, demonstrated predictive value for MACE and long-term survival after carotid endarterectomy. Additional studies are needed to fully understand this prognostic stratification and define therapeutic interventions.

SALA C - Saturday, November 23th, 6:00 p.m.

ORAL COMMUNICATIONS

CV11-26054

POST-IMPLANTATION SYNDROME AND ASYMPTOMATIC MYOCARDIAL INJURY AFTER EVAR

Joel Sousa (Portugal)[1]; João Neves (Portugal)[1]; José Teixeira (Portugal)[1]

1 - Hospital de S. João

Introduction: Post-implantation syndrome (PIS) is the clinical and biochemical expression of an inflammatory response following endovascular aneurysm repair (EVAR), with a reported incidence ranging from 14-60%. Although generally benign, some studies report an association between PIS and post-operative major cardiovascular events (MACE). Nonetheless, the role of PIS in post-operative asymptomatic myocardial injury is unknown.

This work aims to evaluate the relation between post-implantation syndrome and MINS in a subset of EVAR patients, as well as assess the impact of PIS in all-cause mortality.

Methods: All patients undergoing elective standard EVAR between January 2008 and June 2017, and with at least one measurement of contemporary (cTnI) or high sensitivity troponin I (hSTnI) in the first 48h after surgery, were retrospectively analyzed. Post-implantation syndrome was defined as the presence of fever and leukocytosis in the postoperative period in the absence of infectious complications. MINS was defined as the value exceeding the 99th percentile of a normal reference population with a coefficient of variation n<10%, which was >0.032ng/ml for cTnI and 0.0114 (female) and 0,027ng/ ml (male) for hSTnI. Patients demographics, comorbidities, medication, access, anaesthesia and blood loss were also evaluated.

Results: One hundred and thirty-one consecutive patients were included (96.9% male; mean age 75.40 years). Mean follow-up was 26.70 months. The mortality rate was 32.1% (n=43), with two fatalities at 30 days.

The prevalence of post-implantation syndrome was 37.4% (n=49). The prevalence of MINS was 16% (n=21), and it was completely asymptomatic in 85.7% of the cases.

No association was found between PIS and patients' gender, comorbidities or type of anesthesia. A trend suggesting an association between intraoperative blood transfusion and PIS was found (p=0.62), although this may be explained by transfusional reaction. The type of graft used significantly affected the prevalence of PIS (p=0.004), with higher rates observed with the EndurantÒgraft (MedtronicÒ).

Despite previous reports, PIS was significantly associated with a lower prevalence of MINS (p=0,004). Also, survival analysis revealed no differences between patients with or without PIS regarding 30-day mortality as well as long--term all-cause mortality.

Conclusions: No association was found between PIS and long-term all-cause mortality in EVAR patients. Also, and despite the risk of cardiovascular events in post-implantation syndrome, the prevalence of MINS was lower in this group of patients. Further studies are required to clarify the cardiovascular implications of PIS.

CV12-27098
OVERVIEW OF A VASCULAR SURGERY EMERGENCY DEPARTMENT AT A HOSPITAL CENTER

Mafalda Correia (Portugal)[1]; Vânia Constâncio (Portugal)[1]; Joana Silva (Portugal)[1]; Pedro Lima (Portugal)[1]; Bárbara Pereira (Portugal)[1]; Mário Moreira (Portugal)[1]; Luís Antunes (Portugal)[1]; Manuel Fonseca (Portugal)[1]

1 - Centro Hospitalar e Universitário de Coimbra

Introduction: Nowadays, along with improved access to healthcare, an increasing number of patients is observed in the Emergency Department (ED), ranging from non--urgent to emergent.

Objective: The objective of this paper is to investigate patients observed by Vascular Surgery in the ED of a Hospital Center during 6 months.

Methods: Patient selection was preformed through the ED program ALERT®. Data about font of referral, triage assignment, diagnosis, specialties that observed the patient and final referral was collected.

Results: A total of 805 patients was obtained. On average, 4,4 patients were observed per day however.

The font of referral was primary healthcare in 45%, another hospital in 34% and home or nursing home in 9% of the cases.

According to the Manchester Triage System 59% of the patients were assigned to yellow, 24% to orange and 14% to green category. Only 27% of orange and 31% of yellow categories were truly urgent - had promptly surgery or were hospitalized. Conversely, 64% and 35% of patients assigned to orange and yellow categories, respectively, were discharged without a further referral.

Sixty-two percent of the patients are directly referred to Vascular Surgery and 38% from another in-hospital specialty.

Globally, 27% were operated or hospitalized, 26% were already followed or referred to Vascular Surgery consultation and 50% were discharged without a referral. From those transferred from another hospital 48% returned to the origin without a referral.

Regarding patient's pathology: 44% had peripheral arterial disease (PAD) or diabetic foot, 17% deep vein thrombosis (DVT) and 9% phlebitis. Embolic acute ischemia and dialysis access related issues both accounted for 5%. Two percent had aortic pathology and 1% peripheral aneurysms.

Regarding PAD/diabetic foot, 37% of the patients admitted to the ED were urgently operated or hospitalized and 46% was already followed or referred to Vascular Surgery consultation.

Concerning patients with suspicion of DVT, less than 20% of patients were referred from another hospital with D-Dimer level measurement. From those with confirmed DVT, only 6% of the patients were hospitalized or submitted to thrombolysis.

Conclusions: There is an over referral of patients to the ED and the Manchester Triage System didn't accurately reflect the urgency status of the patient. PAD and diabetic foot patients account for most of the patients observed in the ED. Finally, we may conclude that almost half of the inter-hospital transfers might be preventable.

CV13-26025
HYBRID SOLUTIONS FOR AORTIC ARCH: BEYOND ENDO AND OPEN LIMITS

José Oliveira-Pinto (Portugal)[1,2]; Joel Sousa (Portugal)[1,2]; Tiago Soares (Portugal)[1,2]; Mário Lachat (Switzerland)[3]; José Teixeira (Portugal)[1]

1 - Departamento de Angiologia e Cirurgia Vascular do Centro Hospitalar de São João, Porto;
2 - Departamento de Cirurgia e Fisiologia da Faculdade de Medicina da Universidade do Porto;
3 - Mário Lachat

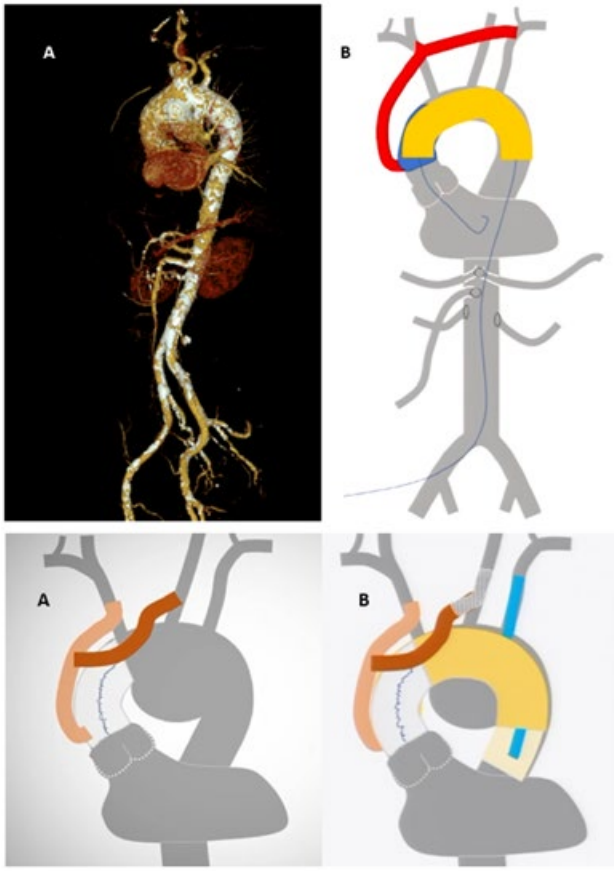
Introduction: Aortic arch aneurysms represent life-threatening conditions. Open repair has been the mainstay of treatment over the last decades but the advent of complex endovascular solutions have broadened indications for higher risk patients.

The aim of this study is to report hybrid solutions as feasible alternatives in high risk patients unsuitable for total endo repair

Methods: The authors present three cases of thoracic aortic ach repair (two arch aneurysms and one pseudoaneurysm), with three different hostile anatomies, successfully treated with hybrid approaches.

Results

Case 1: Male, 69 years old, history of type 2 Diabetes and dyslipidaemia. Referenced to the cardiothoracic surgery due to aortic arch aneurysm (60 mm of maximum



diameter) and diffuse aortic calcification (porcelain aorta) – Figure 1A.

Repair was performed in two steps. Step 1: ascending aorta endarterectomy and replacement with a prosthetic conduit, in order to create landing zone 0. Posteriorly a full debranching from the implanted conduit was performed to LSA; BCT; LCCA and LSA. Step 2: landing zone 0 TEVAR - Figure 1B. Patient deceased 3 months after surgery due to cerebral event.

Case 2: Male, pseudoaneurysm of distal anastomosis after Bentall surgery. Due to anterior projection of the pseudoaneurysm, bleeding risk was unacceptable for open repair. Patient underwent full supra-aortic debranching and subsequently TEVAR in landing zone 1 with parallel graft to the braquicefalic trunk.

Case 3: Male, 68 years old with history of myocardial infarction and COPD. Diagnosed with 70 mm arch aneurysm with an ascending aorta of 48mm. Patient refused E-vita open and branched/fenestrated grafts. Hybrid procedure was choosed: step 1 – ascending aorta wrapping and open debranching of BC trunk and LCA (Fig 2A); step 2 – TEVAR landing zone 0 with periscope for LSA (Fig 2B). Post-operative period uneventful no complications reported up to 8 months of follow-up.

Discussion: Aortic arch aneurysms represent life-threatening scenarios with multiple and complex solutions. While open repair has been traditionally more adopted, clinical risk may constitute an obstacle. On the other hand, endo solutions have emerged as interesting approaches but anatomic suitability limit patients' selection for these techniques. Hybrid repair represent safe and feasible alternative for selected cases.

CV14-27104

MIOCARDIAL INJURY AFTER NON CARDIAC SURGERY AFTER SUPRAARTICULAR FEMOROPOPLITEAL BYPASS

Filipa Jácome (Portugal)[1]; Marina Dias-Neto (Portugal)[1]; João Rocha-Neves (Portugal)[1]

1 - Hospital Universitário de São João

Introduction: Short and long term risk of myocardial infarction (MI) and stroke have been strongly associated with the presence of MINS, with an associated mortality rate superior to 10% in the first year.

Aim: This study aimed to evaluate the incidence of MINS after supraarticular femoropopliteal bypass and validate its prognostic value as a predictor of major adverse limb events and mortality.

Methods: A retrospective cohort of consecutive patients submitted to supraarticular femoropopliteal bypass

Table 1. Demographic data of patients who underwent supraarticular femoropopliteal bypass

	Without MINs (n=25)	With MINs (n=5)	P=	Total
Age, mean	70.72 ± 9.72	62.00 ± 16.2	0.1	69.27 ± 10.8
Sex (males) n	23	4	0.414	27
Diabetes Mellitus, n (%)			0.365	
- no	13	4		17
- under oral therapy or insulin	12	1		13
Hypertension, n (%)			0.572	
- no	6	0		6
- mono/dual/triple therapy	19	5		24
Statin use	20	5	0.326	25
BMI, mean	24.66±4.8	27.34		???
Tobacco use			0.535	
- Active smoker	13	3		16
- Stop smoking	5	0		5
Coronary heart disease, n (%)			0.107	
- Angina (Stable/Unstable)	4	3		7
- Myocardial infarction	4	1		5

Table 2. Mortality among patients with and without MINs.

Suvival Death P=0.001	30 D	1 year	MALE P=0.326	30 D	1 year
No Mins	25	19 (90.5) SE: 6.4 2	No Mins	24	19 (90.9) SE: 6.1 2
MINS	3 (60) SE 21.9 2	3 (60) SE 21.9 2	MINS	3	3

(SAFPB) in a tertiary referral center between May 2015 and December 2016 was assembled. The established primary endpoints were major adverse limb events (MALE); and mortality, in the MINS population. The median follow-up was 28 months.

Results: 30 patients were submitted to SAFPB and had postoperative troponin measurements. MINS demonstrated a higher prevalence regarding congestive heart failure (4(80%) vs 4 (16%) P=0.011). No additional significant differences were found between groups. Mortality was higher among patients with MINS (p=0.006). The causes of death are displayed in table 2 for the two groups.

Discussion: CHF was suggested as a predictor of MINS. The sample is reduced, which limits the results and its external validity.

Conclusions: Although being an ongoing and still enrolling study, MINS demonstrated some predictive capacity regarding death. No prognostic value regarding MALE was found. Further studies concerning prophylaxis and management of MINS should be carried on focusing on its cardiovascular prognostic value.

CV15-27076
PSOAS MUSCLE: AN UNUSUAL SUSPECT OF UNILATERAL LEG EDEMA

Joana Pimenta (Portugal)[1,2]; José Videodo (Portugal)[2]; André Vinha (Portugal)[2,3]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; José Almeida Pinto (Portugal)[2]

1 - Unidade Local de Saúde do Baixo Alentejo;
2 - Centro Hospitalar do Tâmega e Sousa;
3 - Centro Hospitalar Universitário da Cova da Beira

Objectives: Lower limb edema may have various causes. We present two clinical cases of patients with unilateral lower limb edema originating from psoas muscle pathology.

Material and Methods: Retrospective review of patient clinical data.

Results: The first case is of a 68-year-old woman complaining of pain and edema of the left leg for two weeks; she presented with godet-positive left leg edema and tenderness. The patient was admitted due to elevated inflammatory parameters and unexplained fever. Imaging investigation revealed a left psoas sarcoma with osseous metastasis and iliac compression, resulting in ilio-femoral DVT. Due to progressive clinical degradation, only palliative care was implemented, and the patient died during the hospital stay.

The second case is a 68-year-old man with a previous medical history of congestive heart failure NYHA III, chronic renal disease 3a, arterial hypertension and dyslipidaemia, and documented left iliopsoas bursitis. He presented with worsening bilateral lower limb edema for the last month, with perineal extension. After renal and cardiac function stabilization, the lower limb edema became unilateral to the left limb. Doppler-ultrasound ruled out DVT, and the CT scan identified a worsening iliopsoas bursitis. Percutaneous drainage was undertaken with good clinical response, and the patient was discharged. Within a month, the patient was admitted for recurrence, having undergone a new percutaneous drainage with sclerotherapy through the drain (40 mg metilprednisolone + 2cc de lidocaine 2% + 1cc contrast), showing no communication with the hip joint. The patient improved and was discharged with compression stockings and DVT prophylaxis. Since then, no other recurrences were documented.

Conclusion: Iliopectineal bursitis is a rare pathological condition; communication with the hip joint is present in about 14% of the population. According to the literature, about 44% of patients present with unilateral leg swelling, other complaints being groin pain and/or mass or paresthesia due to neurological involvement.

Regarding the psoas sarcoma, there have not been previous reports in the English-language literature to our knowledge; there are, however, reports of lymphomas presenting as unilateral leg edema.

Both these cases emphasize the importance of including intra-abdominal or articular causes in the differential diagnosis of unilateral lower limb swelling.

CV16-27090
A COMPLICATED ACUTE TYPE B DISSECTION – CLINICAL CASE

Rita Bento (Portugal)[1]; Gonçalo Rodrigues (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Ricardo Correia (Portugal)[1]; Isabel Vieira (Portugal)[2]; Rita Garcia (Portugal)[1]; Fábio Pais (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

1 - Hospital de Santa Marta;
2 - Hospital do Divino Espírito Santo

Introduction: Stanford type B aortic dissections (TBADs) involve the descending aorta and can present with complications, including malperfusion syndrome or aortic rupture, which are associated with significant morbidity and mortality if left untreated.

Objective: To describe a clinical case of a complicated TBAD.

Methods: Based in clinic report.

Results – case report: A male, 47-year-old patient, with no medical background, no previous medication and smoking habits, presented at the ER with generalised malaise, chest pain, palpitation, pain and decreased strength in the right lower limb, with 3h of evolution. The patient presented an episode of vomit and hematochezia. Physical examination on admission, revealed poor general state, pale, dyspneic,

BP of 200 × 120 mmHg, HR of 90 bpm and right lower limb hipoperfusion. Critical care was initiated, controlling BP with labetalol and monitoring the patient in an ER.
Laboratory results showed acute renal failure (urea 35 mg/dL, serum creatinine 1.5 mg/dL), worsening hepatic function (AST 672 U/L; ALT 817 U/L), CK of 7867 U/L, myoglobin of 1922,5 ng/mL and lactate 7.0 mmol/L. CT-angiography showed an TBAD, starting on LSA extending as far as CT, SMA, renal arteries (occlusion of left renal artery) and the common iliacs arteries (occlusion of the left iliac artery).
Emergent TEVAR was indicated, and a covered stent (ZENITH TX2 Dissection 36x79mm) to exclude the proximal tear was deployed in Zone 2. Once the collapsed true lumen was confirmed, additional bare stents were deployed, extending to the aortic bifurcation. A covered kissing stent was deployed in the common iliac bifurcation (ADVANTA 10x38mm left CIA + ADVANTA 9x59mm right CIA). A ballon expandable bare stent FLEXIVE 5x40mm was deployed in LRA.
The control angiography showed that the proximal flap had been sealed, the true lumen was significantly expanded from the distal arch to the abdominal aorta and the visceral arteries and obstructed iliac artery flow was resolved completely. All preoperative symptoms were improved immediately after the operation, a total recovery of renal, hepatic and gastrointestinal function was observed.
Discussion: Complicated TBADs are associated with significant morbidity and mortality if left untreated. Clinical diagnosis is straightforward, typically confirmed using CT angiography. Treatment begins with immediate anti-impulse medical therapy. Acute TBAD with complications should be repaired with emergent thoracic endovascular aortic repair (TEVAR).
Conclusion: The Full Petticoat technique has demonstrated acceptable short-term results for dynamic obstruction due to complicated TBADs.

CV17-27102
DIAGNOSING GIANT CELL ARTERITIS: ABDOMINAL AORTA FIRST

Joana Pimenta (Portugal)[1,2]; José Vidoedo (Portugal)[2]; André Vinha (Portugal)[2]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; José Almeida Pinto (Portugal)[2]

1 - Unidade Local de Saúde do Baixo Alentejo;
2 - Centro Hospitalar do Tâmega e Sousa

Objectives: The authors intend to remind the possibility of large vessel involvement in giant cell arteritis, namely of the abdominal aorta.
Material and Methods: Review of patient clinical data.
Results: A 70-year-old woman presented with a month-long history of excessive nocturnal sweating, anorexia and weight loss, and paroxysmal fever during the previous week. She had an elevated white blood cell (WBC) count of 25.67x109/L, with 87% neutrophils and C-reactive protein (CRP) of 160.5 mg/L. On abdominal CT scan an 8mm circumferential wall thickening of the distal infra-renal aorta was identified. Fever persisted, and new onset holocranial headache and jaw claudication was noted. Temporal artery was tender on palpation. Inflammatory parameters remained elevated with erythrocyte sedimentation rate (ESR) of 114. An infectious or auto-immune cause was excluded.
Temporal artery biopsy revealed degenerative endarteritis with intimal thickening, luminal stenosis and histiocytic infiltrate.
The patient was started on high-dose steroid therapy showing improvement within two days. At 3-month follow-up she was asymptomatic and repeat abdominal CT scan showed the same 7mm wall thickening of the infra-renal aorta. At 1 year follow-up she remained asymptomatic, and steroid therapy has been continued long-term.
Conclusion: Aortitis in GCA is the most worrisome large vessel implication but it is also a rare location; the ascending aorta is more frequently affected. Our patient presented with weight loss and fever with elevated inflammatory parameters associated with more typical temporal arteritis symptoms.
Inflammatory parameters are usually but not mandatorily increased. The temporal artery biopsy is less than ideal due to the segmental nature of the disease and the fact that some large vessel disease patients might not have temporal arteritis.
Treatment is centered on corticosteroids, enabling good symptom control as evidenced by our case. In patients with refractory symptoms, other immunosuppressants might be considered. Surgery is reserved for patients requiring aortic valve function restoration, symptomatic or enlarging aneurysms, or to restore aortic branches patency.

CV18-26053
JUXTARENAL AORTIC OCCLUSION – A THREAT TO THE KIDNEYS?

Pedro Alves Martins (Portugal)[1]; Madalena Romero (Portugal)[1]; Sergio Eufrasio (Portugal)[1]

1 - Hospital Distrital Santarém

Introduction: Juxtarenal aortic thrombosis is an uncommon and advanced form of aortoiliac disease, whose surgical treatment is demanding. Its proximal aortic extension is feared due to renal/visceral complications and associated mortality.
Objectives: The authors report the case of a patient with

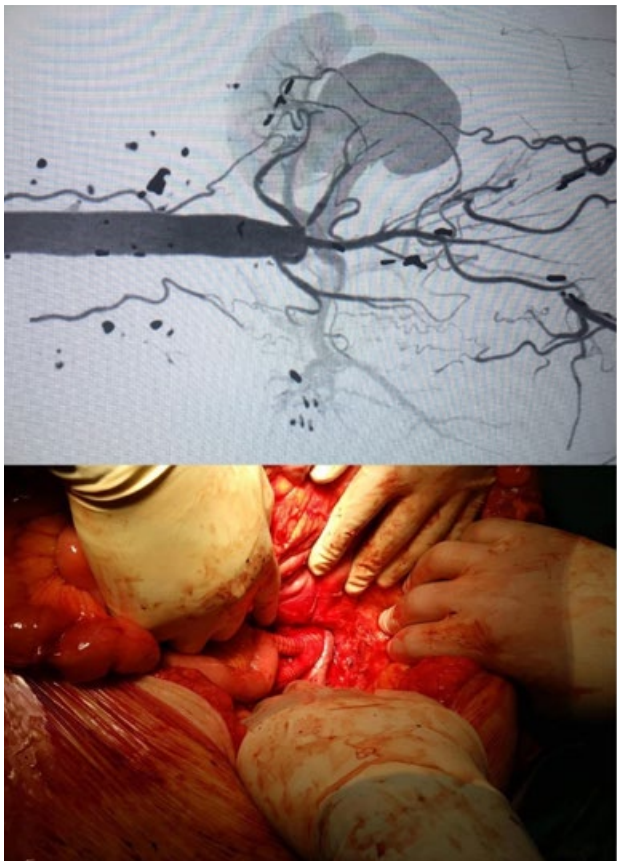
juxtarenal aortic thrombosis whose proximal extension caused right renal atrophy and renovascular hypertension due to critical renal artery stenosis of the single functioning kidney, who underwent successful revascularization by conventional surgery.

Materials and Methods: A 65-year-old female smoker with a history of aorto-bifemoral bypass 15 years earlier due to aortoiliac disease was referred to the Vascular Consultation for incapacitating lower limbs claudication lasting for one year. The patient had no femoral pulses and the angioTC study showed occlusion of the aortic bypass in the context of juxtarenal aortic thrombosis and revascularization was suggested. The patient did not accept the surgical proposal and was lost in the follow-up.

She was referred again after one year for worsening of the claudication and difficult to control hypertension. AngioTC study showed proximal extension of aortic thrombosis with right renal artery occlusion and marked ipsilateral kidney atrophy, as well as critical left renal artery stenosis.

She underwent a median xipho-pubic laparotomy, transperitoneal isolation of the para-renal area, and referral of both renal arteries. Under suprarenal clamping (22 minutes), para-renal aortic thrombectomy and aorto-bifemoral interposition was performed with bifurcated prosthesis (Dacron 16x8mm) with preservation of the left renal vein. In the postoperative period there was a transient acute renal failure, and the patient was discharged on the 12th day.

Results: After 6 months, the patient is asymptomatic, with broad pedis pulses, controlled blood pressure and normalized renal function. The angioTC study shows aortic and left renal revascularization in good condition.



Conclusion: The case report presented shows that juxtarenal aortic thrombosis can be a dynamic entity whose proximal extension is ominous by renal/visceral impairment. Its conventional surgical treatment is demanding but with favorable results as shown.

CV19-26062

RUPTURED MYCOTIC POPLITEAL ARTERY ANEURYSM - A CASE REPORT AND LITERATURE REVIEW

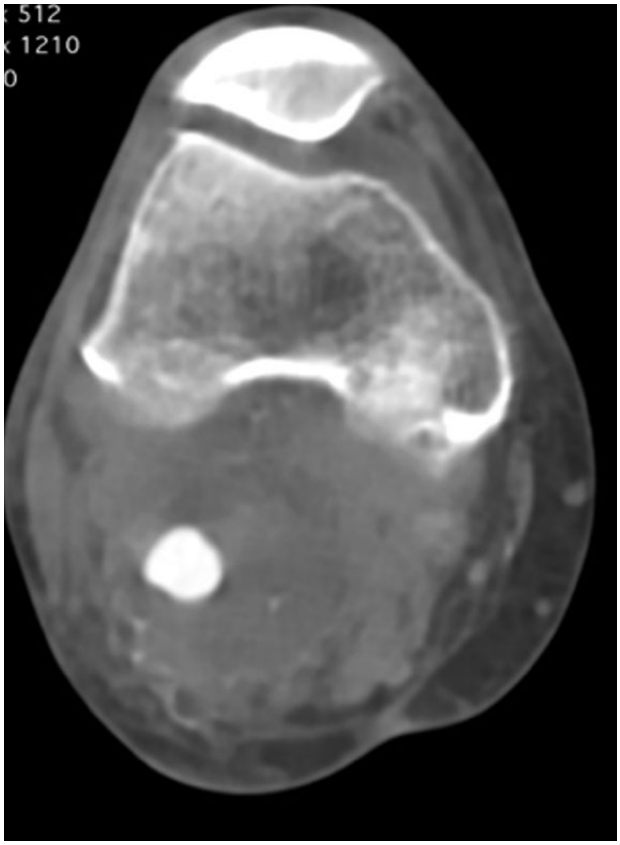
Joana Catarino (Portugal)[1]; Gonçalo Alves (Portugal)[1]; Carlos Amaral (Portugal)[1]; Nelson Camacho (Portugal)[1]; Ricardo Correia (Portugal)[1]; Rita Bento (Portugal)[1]; Fábio Pais (Portugal)[1]; Isabel Vieira (Portugal)[1]; Rita Garcia (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

1 - Hospital Santa Marta

Introduction: Mycotic popliteal artery aneurysms (MPAA) are an extremely rare condition. The estimated male-to-female ratio is 11:3 and customarily presents as a painful, tender, pulsatile leg swelling in pyrexic patients. Less than 50 cases are described in literature, and rupture as a complication of these aneurysms was reported in less than 5 of these cases. Positive cultures only appear in approximately 50% of patients. The gold standard management is surgical intervention. A prolonged antibiotic therapy is mandatory.

Methods: This is a case-report of a patient who was referred to our emergency department with a history of inflammatory signs in the right popliteal fossa associated with a pulsatile mass and fever. A literature review was also done. **Results:** The patient was a 78 years-old male, with a past medical history of chronic renal disease, benign prostatic hyperplasia and a endocarditis secondary to S. Aureus (10 mouths before). The patient referred inflammatory signs in right popliteal fossa and fever for the past week, with acute onset of pain hours before admission. The physical examination showed signs of local inflammation in the popliteal region, and filiform distal pulses were present. The laboratory findings showed a significantly raised white blood cell count of 20,32x10^9, with 90% neutrophilia and PCR 295,9mg/dl. A duplex scan showed a popliteal aneurysm of 5cm transverse diameter, without deep vein thrombosis. Angio CT scan showed a unilateral popliteal aneurysm with evidence for contained rupture and 3 vessel runoff. We assume a rupture MPAA and initiate broad spectrum antibiotics. Surgery was performed through a standard medial approach and a popliteal-popliteal bypass with reversed GSV was done

VASCULAR SURGERY



after aneurysm exclusion. The aneurysm was opened through a posterior approach and organized thrombus with evidence of purulence was encountered and sent to microbiology lab. The postoperative course was uneventful apart from mild oedema of the limb, with complete normalization of laboratory findings. The cultures were positive for methicillin sensitive S. Aureus and the patient went on flucloxacillin (endovenous) for 14 days. The patient was discharged from the hospital with anticoagulant regimen and antibiotic treatment (flucloxacillin oral) for 6 weeks. At 6 mouth follow-up the patient was assymptomatic, and the control duplex scanning reported no associated complications.

Conclusion: The rupture of MPAA is an extremely rare condition. A high index of suspicion is therefore necessary. The gold standard management is surgical intervention with excision, and reconstruction using an autologous vein graft. A prolonged antibiotic therapy is mandatory.

CV20-27066

POPLITEAL ARTERY ENTRAPMENT SYNDROME TYPE III - TWO CASE REPORTS OF LIMB-THREATENING ISCHEMIA

Fábio Pais (Portugal)[1]; Anita Quintas (Portugal)[1]; Carlos Amaral (Portugal)[1]; Rita Ferreira (Portugal)[1]; Nélson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Isabel Vieira (Portugal)[1]; Ricardo Correia (Portugal)[1]; Rita Bento (Portugal)[1]; Rita Garcia (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

1 - Hospital de Santa Marta, Centro Hospitalar Universitário de Lisboa Central

Introduction: Popliteal artery entrapment syndrome (PAES) is an uncommon vascular condition, that predominantly affects active young males. The patients usually complain of intermittent pain in the feet and calf after the exercise and that vanishes at rest. Acute limb ischemia is a rare presentation. If left untreated the PAES can lead to the popliteal artery stenosis or thrombosis and distal arterial thromboembolism. The gold standard management is surgical intervention. We report two cases of type III popliteal entrapment syndromes that presented with limb-threatening ischemia: the first one was referred to the emergency department with an acute lower limb ischemia and the second one was referred to a appointment with foot rest pain and paresthesia.

Methods: It is presented the diagnostic approach and treatment management of two cases of limb-threatening ischemia, secondary to a type III popliteal entrapment syndrome.

Results: The first patient was a 26 years-old male athlete, referred with acute onset of foot rest pain and paresthesia. The physical examination showed pallor of the foot with sensory (but not motor) impairment and absence of popliteal and distal pulses. A duplex scan showed a segmental occlusion of the popliteal artery. It was performed an MRA that reveal an entrapment of the popliteal artery by an accessory abnormal muscle slip from the medial head of gastrocnemius muscle. Surgery was performed through a posterior approach with myotomy of the accessory abnormal muscle and a popliteal-popliteal interposition with contralateral inverted great saphenous vein. The postoperative course was uneventful and at 4 month follow-up the patient was assymptomatic.

The second patient was a 32 years-old woman, with no relevant past medical history, that is referred to a vascular appointment with paresthesia and foot rest pain in the past month. Angio CT scan and MRI showed a type III popliteal entrapment with a sub-occlusive thrombosis of the popliteal artery. Surgery was performed in similar conditions including

a popliteal-popliteal interposition with small saphenous vein, with recovery of pedal pulse. In the postoperative course the rest pain resolved but the patient kept mild parestesias, that are still present at 6 months of follow-up.

Conclusion: PAES is a rare vascular disease that can present with limb-threatening ischemia. A high index of suspicion is therefore necessary. Delay in diagnosis and management can lead to irreversible effects of lower limb ischemia and impairment in a young active population. The gold standard management is surgical intervention with good outcome

Saturday, November 23th, 4:00 p.m.

SHORT COMMUNICATIONS

CV21-27067

PANCREATO-DUODENAL ANEURYSM RUPTURE – A CASE REPORT

Ricardo Correia (Portugal)[1]; Ana Garcia (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Rita Bento (Portugal)[1]; Fábio Pais (Portugal)[1]; Isabel Vieira (Portugal)[1]; Rita Garcia (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

1 - Hospital de Santa Marta, CHULC

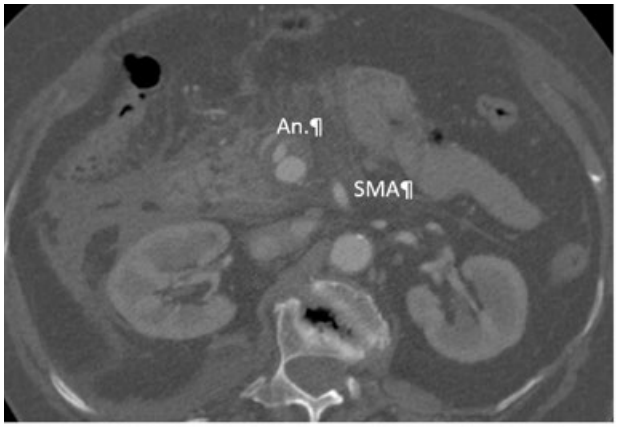
Introduction: Visceral artery aneurysms are rare and usually do not cause symptoms. Often they are diagnosed when ruptured, condition associated with a high mortality rate.

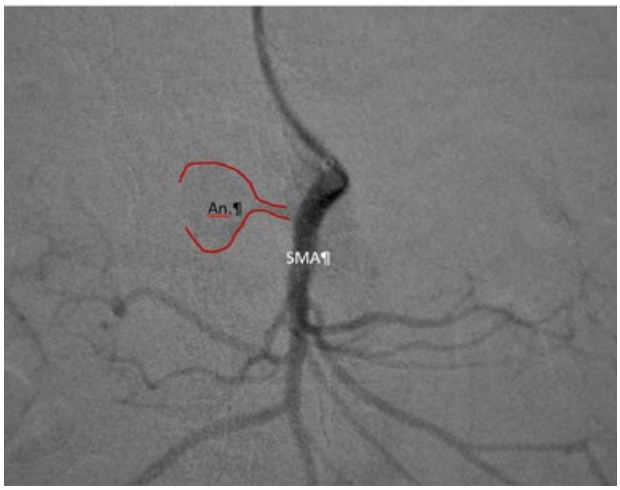
Objective and Methods: This is a case report of a patient with a ruptured visceral aneurysm, that intends to characterize a possible approach to its surgical treatment.

Results: Female patient, 85 years, obese, with hypertension, dyslipidemia, hypothyroidism, and anticoagulated due to atrial fibrillation.

She presented to the ER with sudden onset of upper abdominal pain, lipothymia and acute anemia. She underwent angio-CT scan (Fig.1), that showed a saccular aneurysm involving a collateral of the SMA (superior mesenteric artery), probably the inferior pancreato-duodenal artery. This aneurysm had ruptured and was associated with contained retroperitoneal hematoma.

Patient underwent urgent endovascular procedure via left umeral artery. The SMA selective angiography confirmed presence of saccular aneurysm involving a SMA collateral (Fig.2), that was embolized using microcoils (Cook®). Final angiography showed absence of aneurysm filling with contrast, but procedure was complicated by SMA dissection, solved with balloon angioplasty.





Angio-CT scan at 3 months showed coils in place and absence of contrast enhancement on a periduodenal organized hematoma, decreasing in diameter.

Conclusion: Most often, treatment of ruptured visceral aneurysms uses conventional xifopubic laparotomy, associated with high morbimortality.

However, its difficult conventional exposure challenges this treatment modality, which underlines the role of visceral aneurysm endovascular treatment.

In endovascular treatment of this patology, options include aneurysm exclusion using feeding artery bare metal stenting associated with aneurysm coiling, feeding artery stent graft deployment, simple aneurysm coiling. This decision involves availability, costs and anatomy restraints.

A simple and effective approach like the one used in this case involves feeding artery embolization using coils. Visceral arteries collateral navigation, evaluation of visceral collaterality and precise identification of feeding vessel are challenges in endovascular treatment of visceral aneurysms that authors took in account in treating this patient.

VASCULAR SURGERY

CV22-26034

RADIOLOGICAL SIGNS OF IMPENDING ABDOMINAL AORTIC ANEURYSM RUPTURE - PREDICTING ABDOMINAL AORTIC ANEURYSM FAST-TRACK REPAIR

João Peixoto (Portugal)[1]; João Ribeiro (Portugal)[1]; Ana Semião (Portugal)[1]; Evelise Pinto (Portugal)[1]; Nuno Coelho (Portugal)[1]; Rita Augusto (Portugal)[1]; Andreia Coelho (Portugal)[1]; Alexandra Canedo (Portugal)[1]

1 - CHVNG/E

Objective: The identification of radiological signs that precede the rupture of an abdominal aortic aneurysm (AAA).

The rupture of an AAA is a complication associated with a high mortality rate. Although clinical evaluation remains fundamental, it has limitations in the identification of rupture. This complication is characterized by the presence of an acute hemorrhage, through the aneurysm, in the retroperitoneal and/or intraperitoneal space. The rupture process is, however, complex and progressive, being identified – in an initial phase- signs compatible with the instability of the AAA wall.

To accomplish the proposed goals, an overview synthetizing the findings of the literature retrieved from digital (pubmed) and hospital databases, was done. Experts in radiology and in vascular surgery were also consulted.

The patient is an 83 year old female, autonomous, that resorts to the Emergency Room describing a 15 day evolving abdominal pain. An Angio computerised tomography (angioCT) was preformed that showed a large AAA, showing no signs of overt rupture, nevertheless showing some features of wall instability. The patient was submitted do an endovascular repair of the aneurism (EVAR) with bifurcated stent graft. There were no complications during hospital admission and the patient was discharged 3 days later. One month after discharge, patient was asymptomatic.

CT is the most reliable method for the characterization of an AAA. Aside clinical risk factors for rupture, there are some radiological signs that suggest wall instability and impending rupture: size of the aneurysm, rapid expansion rate, low thrombus-to-lumen ratio, the hyperattenuating crescent sign, outward displacement of calcified intimal plaque, the drapped aorta sign, and the periaortic stranding sign.

The identification of these signs can help stratify the severity of the disease since they appear in relatively specific phases of the rupture process: the decrease in the thrombus-to-lumen ratio and the hyperattenuating crescent sign are early signs of rupture, as opposed to the drapped aorta and the periaortic stranding signs that usually mean severe instability and, in some cases, may already be suggestive of overt rupture.

The identification of AAA's wall instability signs, will be paramount for the identification of patients that will require urgent repair, being, however, achieved a long enough time interval so that the accurate characterization of the AAA, preparation of the surgical and anesthetic teams, as well as the stabilization of the patients medical conditions can be done.

More studies are necessary to validate these signs

Figura 1: Cortes Coronais e Axiais de um AAA em TC com e sem contraste. Observa-se a fissuração do trombo mural (setas brancas), o sinal do crescente hiperatenuante (seta azul) e a diminuição do ratio trombo mural-lúmen (seta preta).

CV23-27065
TYPE II ENDOLEAKS AFTER EVAR: CONSERVATIVE APPROACH OR REINTERVENTION?

Ana Carolina Semião (Portugal)[1]; Clara Nogueira (Portugal)[1]; Ricardo Gouveia (Portugal)[1]; Andreia Coelho (Portugal)[1]; Rita Augusto (Portugal)[1]; Nuno Coelho (Portugal)[1]; Evelise Pinto (Portugal)[1]; João Ribeiro (Portugal)[1]; João Peixoto (Portugal)[1]; Alexandra Canedo (Portugal)[1]

1 - Centro Hospitalar Vila Nova de Gaia/Espinho

Introduction: EVAR is currently the preferential treatment for abdominal aortic aneurysms (AAA), given its decreased rate of periprocedural mortality, complications and length of hospital stay. However, some studies revealed that EVAR is associated to a higher incidence of delayed complications, such as endoleaks. The occurrence of endoleaks following EVAR has posed some challenges. There is a general consensus on the relevance of type I and III endoleaks, which are life threatening conditions that require a secondary intervention. Type II endoleaks are the most frequent type of endoleaks (8-40%) and its treatment remains controversial.

Methods: Patients with type II endoleak and sac growth >10mm during follow-up were elective for treatment.

Results: Three patients were submitted to invasive treatment. Interventions were as follow: transarterial coils embolization; transarterial thrombin and onyx embolization; and translombar sac embolization with thrombin. Technical success was defined as no evidence of flow on the aneurysmal sac at the end of the procedure and was obtained in every patient.

Conclusions: There is lack of evidence supporting the efficacy of a secondary intervention for type II endoleaks following EVAR. These endoleaks have a relatively benign natural history, with 50% spontaneously sealing. According to current AAA guidelines, the decision to treat is based on the size and expansion (>5 mm) of the aneurysm, the type and size of patent inflow and outflow vessels and the presence of symptoms. Whenever we need to plan the treatment of a type II endoleak, it is essential to closely evaluate the images and perform a correct interpretation of the source of the endoleak. Some ingenious techniques may be needed to completely eliminate the aneurysmal sac feeding.

CV24-26043
HORNER SYNDROME - INAUGURAL PRESENTATION OF INTERNAL CAROTID ARTERY ANEURYSM

Pedro Alves Martins (Portugal)[1]; Madalena Romero (Portugal)[1]

1 - Hospital Distrital de Santarém

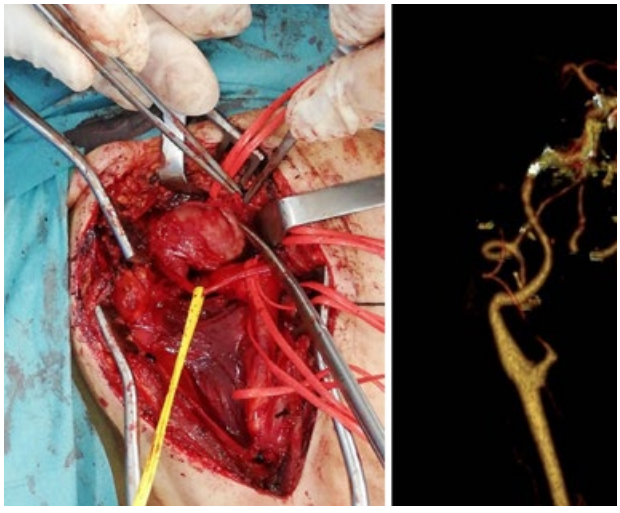
Introduction: Internal carotid artery aneurysm is an unusual entity, in particular associated with Horner Syndrome. Surgical treatment aims to prevent its most important complication, stroke.

Objectives: The authors report the unusual case of an internal carotid artery aneurysm with an inaugural presentation of Horner Syndrome, which was successfully treated by surgical intervention.

Materials and Methods: A 53-year-old woman, hypertensive, referred to Vascular Consultation for eyelid ptosis and right eye miosis in the context of right cervical pulsatile mass near the mandible angle. Doppler ultrasound showed a large distal right internal carotid artery aneurysm. The study was complemented by cervical angioTC which confirmed the previous findings and allowed surgical planning.

Under general anesthesia, the patient underwent a surgical intervention that was initiated by a conventional approach to the carotid bifurcation. The aneurysmal mass was found to be in the supradigastric area, accessed after section of the digastric muscle and identification of the hypoglossal and vagus nerve. Aneurysmal resection and end-to-end anastomosis (clamp time 10 minutes) were performed.

Postoperatively, there were no relevant complications, except minor deviation of the lip commissure and tongue, probably related to hypoglossal nerve stretching injury (referred to physiotherapy). The patient was discharged on the 5th day.



Results: At 3 months of follow-up, the patient had clinical remission of the right Horner Syndrome, as well as a clear improvement of the referred hypoglossal deficit, and performed angioTC demonstrating vascular reconstruction in good condition.
Conclusion: Conventional surgery remains the gold standard, despite the expansion of endovascular treatment, particularly in the most distal segments of the artery. Conventional reconstructive surgery requires experience and technical rigor, yielding favorable and lasting results.

CV25-27110
SPORTS INJURY MISLEADING EDEMA OF THE LOWER LIMB

João Carvas (Portugal)[1]; José Vidoedo (Portugal)[2]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; João Almeida Pinto (Portugal)[2]

1 - General Surgery Department, Unidade Local de Saúde do Nordeste (ULSNE), Bragança;
2 - Vascular Surgery Department, Centro Hospitalar Tâmega e Sousa (CHTS), Penafiel

Male, 25yo, healthy, with a history of leg trauma during leisure sports. Left lower limb became increasingly edematous to the upper thigh and painful while walking. A first ultrasound referred to an injury of the adductor magnus proximal insertion. After a visit to the Vascular Surgery clinic a vascular ultrasound (VU) and then a CT scan both pointed to a DVT of the common femoral/external iliac vein. He was started on apixaban for 3 months. A control ultrasound pointed to an extrinsic mass located near the origin of the external iliac vein suspected of causing venous compression. A venous MRI again reported a DVT on the above mentioned location. However, after careful review of the images it was ascertained that it would probably correspond to reactive lymph nodes (8 and 13mm), that exerted compression at that level. Due to maintenance of complains the patient was proposed for exploratory surgery. A white mass with 2.8cm was adjacent to the postero-medial aspect of the common femoral vein/the transition to the external iliac vein. The vessels were accessed via a retroperitoneal and inguinal approach and the mass could be dissected off the vessel with difficulty. IT was strongly adherent and located beneath the inguinal ligament. Residues of the mass remained on the vessel wall. An early pathology test of the removed mass disclosed no more than lymph node-like tissue and a decision to keep the vein was made. On the first postoperative day a retroperitoneal hematoma was detected and he was submitted to a new surgical exploration. No active bleeding was found and LMWH was stopped. Before discharge a VU disclosed an ipsilateral segmental femoral vein occlusive thrombosis and anticoagulation resumed.

Final pathology revealed fusiform/epithelioid cells, with eosinophilic cytoplasm, prominent nucleolus and assembly of luminal structures. Mitotic index <1mitosis/HPF with areas of necrosis. The lesion infiltrated a lymphatic nodule and surgical margins were positive for tumour. Immunohistochemistry staining was positive for CD31 and CD34 and negative for other cell types. Epithelioid hemangioendothelioma diagnosis was made. The patient was referred to a National Soft Tissue Sarcoma Unit.
Vascular epithelioid hemangioendotheliomas are exceedingly rare tumours that originate from endothelial cells, with only few cases published in the literature (incidence 1/1'000'000). Their biological behaviour varies from quiescence to metastatic disease and curative treatment implies complete excision in order to obtain adequate surgical margins and often reconstruction of the affected blood vessel.

CV26-27111
SYMPTOMATIC ULNAR ARTERY ADVENTITIAL CYST - REPORT OF A CASE

João Carvas (Portugal)[1]; José Vidoedo (Portugal)[2]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; João Almeida Pinto (Portugal)[2]

1 - General Surgery Department, Unidade Local de Saúde do Nordeste EPE (ULSNE),Bragança;
2 - Vascular Surgery Department, Centro Hospitalar Tâmega e Sousa EPE (CHTS), Penafiel

We present a case of a 52 years old woman, manual worker in a clothing factory, without previous health conditions and with no current medication. She was referred to an orthopedic consult by her familly physician because of one month of increasing pain in her right wrist and gradual weakness that incapacitated her for professional activities. She reported decreased grip strength but no numbness. An ultrasound showed a lobulated cyst inside the ulnar tunnel adjacent to the ulnar nerve, without inflammatory signs. On physical exam she had a positive right Froment sign (test for palsy of ulnar nerve), with difficulty to oppose the thumb, and a positive Tinel's sign in the Guyon canal. Negative Durkan and Tinel tests in the elbow. No muscle atrophy was observed but there was slight edema of the hand. Electromyography of the wrist showed no changes in the nerve conductions. An MRI confirmed the presence of a multiloculated cyst with 29x4x8mm adjacent to the ulnar nerve suggestive of a synovial cyst. The patient was proposed for cyst resection and Guyon canal decompression.
Intra-operatively, after an incision over Guyon's canal, the ulnar nerve, ulnar artery and what seemed a fusiform aneurysm of the ulnar artery were identified. Vascular surgery was called the operating room to help with a possible vascular

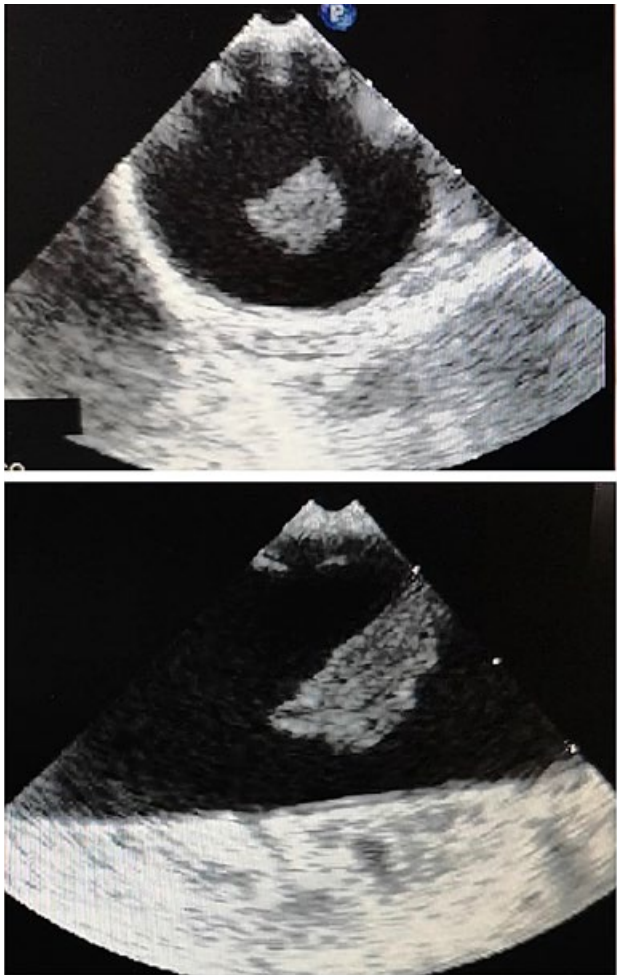
reconstruction. Dissection of the dilated artery segment lead to a leak of mucinous material from the adventitial layer of the vessel, compatible with an adventitial cyst. The cyst was carefully dissected off the artery without compromising blood flow. Pathology confirmed cystic adventitial disease. In the follow up consult (1month), the patient's symptoms markedly improved while still maintaining some paresthesias on the proximal third of the hypothenar eminence.
Cystic adventitial disease (CAD) is a condition where mucinous cysts develop within the adventitia of blood vessels. The most affected artery is the popliteal (more than 80%) and CAD of upper limb accounts for 3,2% of published clinical cases, and to our knowledge only one article reports disease in the ulnar artery.

CV27-27092
FLOATING THROMBUS IN THE DESCENDING THORACIC AORTA: A CASE REPORT

Mariana Adams (Portugal)[1]; Pedro Barroso (Portugal)[1]; Maria José Ferreira (Portugal)[1]

1 - Hospital Garcia de Orta - Serviço de Angiologia e Cirurgia Vascular

A 55 year-old man, with no antecedent medical history of relevance, presented to the emergency room with acute pain of the lower right limb consistent with acute limb ischemia. He was submitted to femoral embolectomy and fasciotomy of the posterior leg compartment. After stabilization of the acute clinical picture, he performed a transesophagic echocardiogram to exclude the presence of thrombi that could be embolizing systemically. It revealed a large, hypermobile mass within the descending thoracic aorta. No cardiac pathologies were observed. Posteriorly, an angio-CT further characterized the mass as a non-occlusive atheromatous plaque, partially calcified, extending from the distal end of the aortic arch to the middle third of the descending thoracic aorta with approximately 6cm in length. A small left renal infarct was evident as well as, consistent with the hypothesis of embolization as the cause of the acute limb ischemia in this patient. Under general anesthesia, the left humeral artery and left femoral artery were exposed (after several unsuccessful attemps to cannulate percutaneosly) and thrombus exclusion was performed by deploying a 26-mm × 10-cm thoracic aortic stent graft (Medtronic Valiant Thoracic Stent Graft System with the Captivia Delivery System) with left subclavian artery exclusion. An anatomical variation was noted, with a bovine arch present, and a 1cm distance between the brachiocefalic trunk and the left subclavian artery. The final angiogram revealed optimal stent-graft position distal to the origin of the left subclavian artery and the luminal thrombus was no



longer visible. The patient was discharged on the 16th day of hospitalization with recovery of right lower limb function and oriented to outpatient follow-up.

CV28-27072
SCREENING AND REFERRAL OF AAA DETECTED ON CT SCANS PERFORMED FOR OTHER PURPOSES

Afonso Q Fonseca (Portugal)[1]; José Vidoedo (Portugal)[1]; João Almeida Pinto (Portugal)[1]; Ricardo Castro Ferreira (Portugal)[1]

1 - CHTS

Introduction: The number of surgeries for Abdominal Aortic Aneurysm (AAA) treatment in Portugal is one of the lowest reported. Published data revealed that the prevalence of AAA is similar compared to other countries. The reasons why there is a lower treatment rate compared to other nations is still matter of debate and it seems not to be fully justified only by the absence of an organized screening

of the target population. Therein the relevance of evaluating the referral of patients with a randomly detected AAA in Computed Tomography (CT) scans done for other purposes.
Methods: The maximum diameter of the infrarenal abdominal aorta of male patients older than 65 years of age was measured in all CT scans, performed from January to December 2018 at an hospital in North Portugal. The mention to the AAA in the radiology report along with eventual referral by the physician that requested the exam were recorded in a database. It was considered correct the recommendation of follow up with abdominal ultrasound (US) or referring to Vascular Surgery (VS). Patients already followed by this specialty were excluded.
Results: A total of 1214 patients were enrolled. Seventy-three (6%) AAA were detected, 50 (4%) were already treated or being monitored. Twenty three were newly diagnosed cases.
Conclusion: In this cohort of patients, a non-negligible rate of AAA was detected in CT scans requested for other purposes, as well as lack of proper referral. The lower treatment rates of AAA in Portugal can be justified at some extent by this, particularly when compared to current practice in other countries. A thorough understanding of the reasons for non-referral must be ascertained in order to spread correct recommendations and raise awareness to this problem.

CV29-26061
THE ROLE OF RE-ENTRY DEVICES IN ILIAC CTOS

Luís Gamas (Portugal)[1]; João Rocha-Neves (Portugal)[1]; António Neves (Portugal)[1]; Filipa Jácome (Portugal)[1]; Joel Sousa (Portugal)[1]; Tiago Soares (Portugal)[1]; Marina Dias-Neto (Portugal)[1]; José Teixeira (Portugal)[1]

1 - Centro Hospitalar São João, EPE

Introduction: As endovascular options continue developing, TASC D iliac lesions, including chronic total occlusions (CTO), are now being treated by an endovascular approach. Long CTOs are usually crossed subtintimally, with inability to reenter the true lumen being a common cause of technical failure. Re-entry devices have proved useful in overcoming this obstacle and extending the role of endovascular interventions to more complex lesions. We report a case of a patient with an iliac CTO treated with an intravascular ultrasound guided re-entry device.
Case report: A 53-year-old patient was admitted for Rutherford 6 left lower extremity arterial occlusive disease. The patient presented with leg ulcers and an ankle-brachial index (ABI) of 0.34. The patient had a history of smoking, pulmonary tuberculosis and Crohn disease. No other comorbidities were present.
On physical examination the patient had absence of left femoral pulse. Preoperative CT angiography revealed bilateral heavily calcified CTO of the common iliac arteries that were flush at the aortic bifurcation and stenosis of the left external iliac artery. The disease pattern was classified as TASC D.
Decision was to perform an endovascular revascularization. In a first attempt, bilateral femoral access was done and the right common iliac CTO was successfully crossed and predilated. The left common iliac CTO was crossed via a subintimal plane but reentry into the aortic lumen was unsuccessful. On a second attempt, a re-entry device (Pioneer Plus, Phillips) was advanced through the left femoral access after subintimal crossing of the target lesion. Re-entry was then accomplished in the aortic lumen. Kissing balloon predilation and kissing stent deployment was then performed. Completion angiography demonstrated no restenosis in the treated segments. Postoperative ABI at 6 months was 0.56 and the ulcers had completely healed.
Discussion: Open surgery has been considered the first-line modality for iliac CTOs, mainly in TASC C and D lesions. However, the aging population has resulted in increasing numbers of patients with prohibitive surgical risk. With the development of the endovascular armamentarium, subintimal angioplasty has gained its role in iliac CTOs, with technical success rates of 86%, with most technical failures being due to inability to reenter the true lumen. In these cases, reentry devices have been used with reported success rates of 91-100%. Complication rates are low, with reported rates of 7%. Subintimal angioplasty with reentry device use is therefore a safe and effective treatment for iliac CTOs.

CV30-27105
THE CONFOUNDING WORLD OF AXILLARY MASS DIFFERENTIAL DIAGNOSES: A CASE REPORT

Mariana Adams (Portugal)[1]; João Vieira (Portugal)[1]; Gil Marques (Portugal)[1]; Maria José Ferreira (Portugal)[1]

1 - Hospital Garcia de Orta - Serviço de Angiologia e Cirurgia Vascular

A 54 year old man presented to the emergency department of a local hospital with an axillary mass of initial rapid increase in proportions and progressively slower growth, for the last four months. The patient was oriented to an outpatient consultation of General Surgery for further study. The mass was palpable, located on the right axillary fossa, and measuring approximately 10x10 cm, circular in shape. The mass was non-pulsating, elastic in consistency and non-mobile. The patient described stinging pain locally on occasion but no pulsating sensation or pain or paraesthesia of the right upper limb. The ultrasonographic appearance of the mass was of a hypervascular lesion, with a clear triphasic doppler signal detected. A CT scan of the

lesion revealed a 10x8 cm lesion, contrast enhancing, serpiginous peripherally and centrally, suggestive of vascular structures – angioma? Sarcoma?. The mass was biopsied but the findings were inconclusive. The MRI scan showed a well-circumscribed isointense mass on T1-weighted images with heterogeneous high signal on T2- weighted images and heterogeneous contrast enhancement, imposing differential diagnosis between hemangioma and sarcoma. At this point, the patient was referred to the vascular surgery outpatient consultation of Hospital Garcia de Orta. He was admitted to our ward for elective surgical excision. Intra-operatively, the humeral artery was isolated and an angiogram was obtained. A hypervascular mass was detected, with two inflow arteries originating from the right axillary artery. Inflow to the mass was reduced using a Vihaban 7*a0 stent. The mass was approached via the axillary fossa, transversely, and completely excised. The piece was sent for histopathological analysis and the preliminary examination was suggestive of arteriovenous malformation.

CV31-26045

CHEVAR FOR PROXIMAL ENDOLEAK – WHAT ELSE?

Pedro Alves Martins (Portugal)[1]; Madalena Romero (Portugal)[1]; Sérgio Eufrásio (Portugal)[1]

1 - Hospital Distrital de Santarém

Introduction: Endovascular treatment of abdominal aortic aneurysm (EVAR) is currently the predominant surgical option for this disease, despite its limitations and medium/long term complications. Post-EVAR follow-up, although simplified, remains crucial to ensure lasting aneurysmal exclusion.

Objectives: The authors report the case of a high-risk patient undergoing EVAR who was found to have endoleak type I with reperfusion of the aneurysmal sac at follow-up who was successfully excluded by a chimney EVAR (chEVAR).

Materials and Methods: An 85-year-old man, hypertensive, with ischemic heart disease, admitted for aortoiliac aneurysm with relevant right primitive iliac component, underwent an aortoiliac EVAR with embolization of the right hypogastric artery, without complications or proximal/distal endoleaks in intraoperative control. The patient was lost in the follow-up, so he was reevaluated by angioTC only one year after the intervention, that showed reperfusion and expansion of the aortic aneurysmal sac by massive type I Endoleak.

We chose to perform the technique of chEVAR through proximal extension with an aortic cuff (32x58mm Alpha Cook Medical®) and bilateral covered stent in the renal arteries (6x38mm Lifestream Bard®). The postoperative period was complicated by pulmonary thromboembolism (therapeutic anti-coagulation and oxygen) being the patient discharged 2 weeks after the intervention.

Results: After one month of the chEVAR, angioTC study showed the procedure in good condition, with adequate proximal sealing, remission of proximal endoleak and permeable renal chimneys.

Conclusion: The reported case report stresses the importance of follow-up of patients undergoing EVAR and the need for rapid re-intervention in the presence of proximal endoleak and aneurysmal re-expansion. The demonstrated chEVAR technique allowed the successful exclusion of a type I endoleak, reinforcing its versatility.

CV32-27112

INFECTED/MYCOTIC AORTIC ANEURYSM: WHAT IS THE BEST TREATMENT? – CASE REPORT AND LITERATURE REVIEW

Bárbara Pereira (Portugal)[1]; Joana Moreira (Portugal)[1]; João Alegrio (Portugal)[1]; Manuel Fonseca (Portugal)[1]

1 - Centro Hospitalar e Universitário de Coimbra

Introduction/Objective: Primary Infected Aortic Aneurysm (IAA) is a rare disease (prevalence 0,6 - 2%) with a poor prognosis.
Medical treatment alone is insufficient in most cases because of the high risk of aneurysm rupture.
Traditionally the treatment involved antibiotics and open surgery, with local debridement and in situ or extra-anatomic revascularization.
In the past years, there have been studies and clinical data supporting the endovascular approach (e.g. «Nationwide – swedish study, European multicentre).
The aim of this paper was a literature review of the best available treatment options of IAA, beginning with an analysis of a case report of an IAA.
Material and Methods: 1. Case report: Man, 80 years old, myelodysplastic syndrome's suspicion, admitted in the hospital for further investigation; 3rd day developed a fever plus increased inflammatory markers; began large spectrum antibiotics; after 5 days of fever and positive hemocultures for Salmonella tiphymurium an angioCT revealed an infra-renal aortic false aneurysm.
2. Literature review: 20 articles selected between 2000 and 2018 (Pubmed); excluding a) Thoracic aortic aneurysm, b) Aortic abdominal aneurysm non-infected, c) Graft infection or aortoenteric fistula d) Aortic ulcer.
Results: The patient was submitted to open surgical repair: median laparotomy with aortic wall ressection, in situ Dacron silver graft replacement and epiploon plasty.
No postsurgery complications.
Anatomic pathology report confirmed and IAA caused by Salmonella tiphymurium.
Antibiotic Trimetropim/sulfametoxazol for 6 weeks.
Good prognosis with more than 6 months follow up.
Discussion and conclusion: Open repair used to be the gold standard treatment for IAA because of the advantage of resection of the infected aneurysm and local tissues but carries a higher mortality and morbidity. However in patients with a stable clinical scenario and good anatomic features it's a feasible and durable option.
Endovascular repair is becoming and elegible treatment (definitve or bridge for a future surgery), with good results, despiste the challenge of placing a graft in an infected area with a higher risk of recurren/persistent sepsis and graft infection.
Due to the rarity and heterogeneity of this disease conclusive evidence is lacking with only limited and small series comparing open versus endovascular treatment. So the success of the treatment is usually related with an early diagnosis and antibiotic therapy followed by a surgical treatment.
Prolonged and large spectrum antibiotic treatment should be initiated with agents effective against Gram-positive cocci and Gram-negative rods.

CV33-27078

SILENT BLEEDING - THE CASE OF SPONTANEOUS RETROPERITONEAL HEMATOMA

Joana Pimenta (Portugal)[1,2]; José Vidoedo (Portugal)[2]; André Vinha (Portugal)[2,3]; Miguel Maia (Portugal)[2]; João Vasconcelos (Portugal)[2]; José Almeida Pinto (Portugal)[2]

1 - Unidade Local de Saúde do Baixo Alentejo;
2 - Centro Hospitalar Tâmega e Sousa;
3 - Centro Hospitalar Universitário Cova da Beira

Objectives: Spontaneous retroperitoneal hematoma is a rare clinical entity where an etiological factor has not been identified.
Material and Methods: Review of patient clinical data
Results: A 77-year-old woman was admitted for an elective anterior colpoplasty; the procedure was uneventful. She had a medical history of hypertension, total hysterectomy with bilateral adnexectomy; and she was not on any anticoagulant or antiplatelet drugs.
On the first post-operatory day the patient complained of nonspecific abdominal pain with a tender abdomen over the right quadrant and a palpable ill-defined mass. Laboratory data showed a haemoglobin drop – 12 to 9 mg/dL with a normal anticoagulation profile. An abdominal CT scan showed an obliteration of retroperitoneal fat planes from the hepatic hilum down the right flank to the iliac crest associated with hematic infiltration.
The patient was hemodynamically stable but was admitted to the high-dependency unit for close surveillance. Her in-unit stay was uneventful without need for blood products; she underwent repeat CT scan imaging showing a progressive decrease in hematoma size without contrast extravasation.
She was discharged on the thirteenth day, and has been asymptomatic since.
Conclusion: According to the literature, retroperitoneal hematoma occurs most commonly in the elderly, probably

in association with the higher use of antiplatelet/anticoagulant medications in this population. However, in a series by Sunga et al. about 15% of patients were not on a blood-thinning regimen. The treatment plan is catered to the patient's hemodynamic status, and surveillance should be on high-dependency or intensive care units. Unstable patients may require angiography and embolization procedures, or even surgery if these fail and for other concurrent surgical conditions, or with significant compressive symptoms.

HEART TEAM

SALA F - Friday, November 22th, 6:00 p.m.

ORAL COMMUNICATIONS SELECTED FOR THE HEART TEAM AWARD

HT01-27081

DUAL ANTIPLATELET THERAPY VERSUS ASPIRIN MONOTHERAPY AFTER CABG: SHORT AND LONG-TERM SURVIVAL

João Oliveira-Gomes (Portugal)[1]; Rui J. Cerqueira (Portugal)[1,2]; Francisca Saraiva (Portugal)[1]; Raquel Moreira (Portugal)[1]; Ana Filipa Ferreira (Portugal)[1]; Mário J. Amorim (Portugal)[1,2]; Paulo Pinho (Portugal)[1,2]; André Lourenço (Portugal)[1,3]; Adelino Leite-Moreira (Portugal)[1,2]

1 - Cardiovascular R&D Unit, Department of Surgery and Physiology, Faculty of Medicine, University of Porto;
2 - Department of Cardiothoracic Surgery, Centro Hospitalar Universitário São João;
3 - Department of Anesthesiology, Centro Hospitalar Universitário São João

Background: There is currently conflicting evidence regarding dual antiplatelet therapy's (DAPT) security profile and the outcomes of this pharmacological regimen in patients undergoing CABG.

Aim: We aim to compare the effect of early DAPT in short and long-term survival versus aspirin in a monotherapy regimen (ASA). Therapy's safety was evaluated through early mortality and bleeding outcomes.

Methods: Single-center retrospective cohort study, on consecutive patients undergoing 1st isolated CABG surgery in 2010. Pre-, peri- and postoperative data were collected through clinical files and informatics databases. The DAPT and ASA groups were defined considering the institution of clopidogrel plus aspirin and only aspirin, respectively, within a 24h window after surgery.

T-tests and Pearson's chi-squared tests were used for group comparison. Survival analysis was performed using Kaplan-Meier curves compared through Log-Rank test and multivariable Cox regression. Propensity scores (PS) were

estimated using a multivariable logistic regression and included in multivariable regressions as a covariate along with DAPT. Median follow-up time was 9 years. Early mortality was defined if occurred before discharge or within the 30 days following the surgery; bleeding was assessed through red blood cells (RBC) transfusion, re-exploration of thorax and drainage.

Results: We included 351 patients and DAPT was performed in 251 patients (71.5%). Mean patient's age was 64±10 years and 81% were male. DAPT patients were younger (63±10 vs. 66±10 years, p=0.007) but DAPT and ASA groups were similar regarding the cardiovascular modifiable risk factors. Kaplan-Meier curves showed similar cumulative survival between groups (75% in DAPT vs. 67% in ASA group, Log-rank p=0.103), as well as the PS adjusted analysis (HR DAPT: 0.928, 95%CI: 0.570-1.513). Regarding safety outcomes, we found no differences in early mortality (one patient per group, p=0.489). Aligned with the similar post-operative total median drainage (1220mL in DAPT vs. 1300mL in ASA, p=0.490), the total median cell-saver transfusion (300mL vs. 250mL, p=0.318) and the re-exploration of thorax due to bleeding (1.6% vs. 4% p=0.231) showed no statistical significance either. However, there was a lower frequency of DAPT patients requiring 3 or more peri and postoperative RBC transfusions (8.5% vs. 13.3% p<0.001 and 4.8% vs. 13%, p=0.009, respectively). Redo-CABG was performed in 3 patients (2 DAPT vs. 1 ASA), during follow-up.

Conclusion: Compared with ASA, DAPT showed non-significant impact in long-term survival but demonstrated to be a safe option within the assessed bleeding outcomes. Further studies are needed to provide recommendations on the therapeutical strategy following CABG.

HT02-27088
COST-EFFECTIVENESS OF TRANSCATHETER AORTIC VALVE IMPLANTATION VERSUS SURGICAL AORTIC VALVE REPLACEMENT IN PATIENTS WITH SEVERE AORTIC STENOSIS

Sara Maia (Portugal)[2,5]; Rui J. Cerqueira (Portugal)[1,3]; Paulo Pinho (Portugal)[3]; Francisca Saraiva (Portugal)[1]; Afonso Pedrosa (Portugal)[4]; Rui Rodrigues (Portugal)[2]; Paulo Araújo (Portugal)[2]; Marta Tavares-Silva (Portugal)[1,2]; Adelino F. Leite-Moreira (Portugal)[1,3]; Filipe Macedo (Portugal)[1,2]; Susana Oliveira (Portugal)[5]

1 - Cardiovascular R&D Center, Surgery and Physiology Department, Faculty of Medicine, University of Porto;
2 - Department of Cardiology, Centro Hospitalar Universitário São João;
3 - Department of Cardiothoracic Surgery, Centro Hospitalar Universitário São João;
4 - Data Intelligence Service, Centro Hospitalar Universitário São João;
5 - Faculty of Economics, University of Porto

Background: Transcatheter aortic valve implantation (TAVI) has emerged as a new treatment option for patients with severe aortic stenosis. Despite its low periprocedural risk profile in comparison to surgical aortic valve replacement (SAVR), the high device costs might impact their implementation in budget-constrained countries.

Objective: To evaluate cost-effectiveness of transfemoral TAVI versus SAVR in patients with severe aortic stenosis.

Methods: Retrospective single-center cohort including a group of consecutive patients undergoing transfemoral TAVI between January 2015 and December 2017, and a group of patients undergoing isolated SAVR in the same time horizon and selected according to gender and age. Follow-up information (New York Heart Association class and all-cause mortality) was consulted after 1, 6 and 12 months of the procedure and the multiple imputation method was used to treat the missing data. Costs were determined from the perspective of the Health Care Provider. The effectiveness was measured in Quality Adjusted Life Years (QALY). The Incremental Cost Effectiveness Ratio (ICER) was calculated and a willingness to pay threshold of 30.000 €/QALY was considered. Appropriate statistical tests were used to compare two independent groups, multivariable Cox Regression was applied to survival analysis and the bootstrap resampling method with 1000 simulations was used to represent the cost-effectiveness plan. Results: We included 112 individuals in each group. Mean patient's age was 81±5 and 60,7% were female. Time to discharge was 8,7±8,2 days for TAVI and 13,5±22,8 days for SAVR (p=0,042). Median Society of Thoracic Surgeons (STS) score was 4,55% and 3,49% in TAVI and SAVR groups, respectively (p<0,001). After adjusting for STS score, no difference in 1-year all-cause mortality as found between the two groups (HR: 1,652; 95%CI: 0,487-5,607). Costs related to human resources, drugs and hospitalization were lower in TAVI (3.577 € vs 6.313 €), but those concerning materials, diagnostic tests and use of the cardiac catheterization laboratory were higher (20.857 € vs 3.196 €). The ICER was 465.874 €/QALY. Subgroup and sensitivity analysis showed nevertheless that patients with STS> 8% had an ICER of 36.988 €/QALY and the scenario of 90% off on percutaneous valve prosthesis cost of 30.547 €/QALY.

Conclusion: In this single-center retrospective study TAVI, compared to SAVR, was not considered cost-effective. However, in the two previous scenarios (high STS score and low percutaneous valve prosthesis cost) it may be closer to being cost-effective. Further prospective and multi-center studies are needed to provide an extensive estimation of cost-effectiveness of TAVI in Portugal.

HT03-27085

ACUTE KIDNEY INJURY AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY: PREDICTORS AND SURVIVAL IMPACT

Raquel Moreira (Portugal)[1]; Rui J. Cerqueira (Portugal)[1,2]; Francisca Saraiva (Portugal)[1]; Ana Filipa Ferreira (Portugal)[1]; Mário J. Amorim (Portugal)[1,2]; Paulo Pinho (Portugal)[2]; André P. Lourenço (Portugal)[1,3]; Adelino F. Leite-Moreira (Portugal)[1,2]

1 - Cardiovascular R&D Center, Surgery and Physiology Department, Faculty of Medicine, University of Porto;
2 - Department of Cardiothoracic Surgery, Centro Hospitalar Universitário São João;
3 - Department of Anesthesiology, Centro Hospitalar Universitário São João

Introduction: Cardiac surgery may induce acute kidney injury (AKI) and need for renal replacement therapy, being the second most common cause of AKI in the intensive care unit.
Purpose: To determine AKI incidence after coronary artery bypass grafting (CABG) surgery, its predictors and its impact in immediate and long-term survival.
Methods: Retrospective single-center cohort study including all CABG surgeries performed in 2012 and 2013. Patients on haemodialysis before surgery and off- to on--pump conversions were excluded. AKI was defined as an increase of at least 0.3 mg/dL in creatinine within 48 hours, or an increase to 1.5 times or more from baseline, within 7 days after CABG. Chi-square tests and independent t-tests were used to compare patients with and without AKI. A multivariable logistic regression model was used to identify independent AKI predictors. To determine the effect of AKI in long-term survival, Kaplan-Meier curves, Log Rank test and multivariable Cox regression (maximum follow-up time: 6 years) were used.
Results: We included 804 patients, mean age 64±10 years, 82% being male. AKI occurred in 89 patients (11%). These patients were older (67±10 vs. 64±10 years, p=0.003), presented more frequently diabetes (51% vs. 39%, p=0.028), recent acute myocardial infarction (AMI; 52% vs. 39%, p=0.025), NYHA class III-IV (13% vs. 6%, p=0.034), moderate to severe left ventricular dysfunction (28% vs. 18%, p=0.023), lower haemoglobin and haematocrit (13 g/dL vs. 14 g/dL, p=0.005 and 38% vs. 40%, p=0.005, respectively) and worse renal function preoperatively (lower glomerular filtration rate (82 vs. 91 ml/min/1.73m2, p<0.001)) compared with patients without AKI. In multivariable analysis, age (OR: 1.03, 95% CI: 1.00-1.06, p=0.014), male gender (OR: 2.03, 95% CI: 1.02-4.04, p=0.045), recent AMI (OR: 1.61, 95% CI: 1.01-2.58, p=0.046) and pre-operative creatinine (OR: 2.43, 95% CI:1.40-4.23, p=0.002) emerged as independent AKI predictors. Regarding long-term survival, patients AKI did not show differences in cumulative survival compared to patients without AKI (86% vs. 90%, Log-rank test p=0.094). AKI was not an independent predictor of mortality in multivariable Cox regression (HR: 1.31, 95% CI: 0.70-2.48, p=0.400), but was associated with higher early mortality (4.5% vs. 0.6%, p=0.007).
Conclusion: At our center AKI incidence after CABG surgery was 11%. Older age, male gender, recent AMI and higher pre-operative serum creatinine were settled as AKI independent predictors. This immediate post-CABG outcome did not show association with mid-term survival, but was related to worst early mortality.

HT04-26047

WHICH FACTORS IMPACT LONG-TERM SURVIVAL AFTER CARDIAC SURGERY?

Pedro Magro (Portugal)[1]; Miguel Sousa Uva (Portugal)[1]; José Neves (Portugal)[1]

1 - Hospital de Santa Cruz

Introduction: Cardiac surgery procedures are one of the most common surgical procedures performed in the developed world. It is also one of the most impacting surgical procedure, economically, socially and mortality-wise. Procedure specific risk factors have been proposed regarding peri and long- term mortality. However, large cohorts with longtime followup in the Portuguese population are lacking.
Objective: Our objective is to evaluate which factors independently impacted the long-term survival of patients submitted to a cardiac surgery procedure in our institution, with a minimum follow-up of 10 years.
Methods: We retrospectively identified 2419 consecutive patients with a minimum follow-up of 10 years who were submitted to a cardiac surgery procedure at our institution. Available covariates considered relevante for the analysis were: patient sex; age group; CCS and NYHA class; coronary artery disease extension including main left artery disease; impaired LVF; diabetes; arterial hypertension; previous stroke; previous cardiac surgery; urgent/emergent procedure; obesity; pre-operative AF; pre-operative necessity of inotropes or circulatory support device; eGFR; duration of CBP; and procedural type (isolated CABG vs isolated valvular vs combined CABG and valvular vs congenital vs other). A cox regression with time-dependent covariates was used to account for individual hazard ratios. A p<0,05 was considered significant.
Results: Age, type of procedure, eGFR, CBP duration >120', urgent/emergent surgery, previous stroke and

previous cardiac surgery were identified as independent risk factores regarding long-term survival. The highest HR were identified for eGFR 30-59 ml/min/1.73m2 (HR 3,4 CI 2,4-5,0, p>0,001); eGFR <30 ml/min/1.73m2 (HR 2,1, CI 1,7-2,6, p>0,001); Valvular procedures (vs CABG) (HR 2,1 CI 1,5-2,8, p>0,001); Combined valvular and CABG (vs CABG) (HR 2,1 CI 1,4-3,1, p>0,001) and age equal or above 80 years (HR 2,0 CI1,3-3,0, p=0,002). Our cohort revealed lower 10-year survival when compared with an age and gender matched sample of the Portuguese population (p<0.001).

Discussion and conclusions: Factors that impact long--term mortality may reflect surgical complexity (previous cardiac surgery, type of procedure and CBP duration), be a surrogate of cardiovascular disease burden(eGFR, previous stroke, age) or relate to pre-operatively morbid state (urgent/emergent surgery, age). Even though not every risk factor is avoidable, a better understanding of our population specifics may provide useful in surgical planning and risk control. It also provides precious insight regarding which populations best and less benefit from our intervention survival-wise.

HT05-26056

OBESITY AND MORTALITY AFTER CORONARY REVASCULARIZATION, STILL A PARADOX ON LONG-TERM FOLLOW-UP?

Paulo Veiga Oliveira (Portugal)[1]; Márcio Madeira (Portugal)[1]; Sara Ranchordás (Portugal)[1]; Tiago Nolasco (Portugal)[1]; João Roque (Portugal)[1]; Sérgio Boshoff (Portugal)[1]; Marta Marques (Portugal)[1]; Luís Bruges (Portugal)[1]; José Calquinha (Portugal)[1]; Miguel Sousa-Uva (Portugal)[1]; Miguel Abecassis (Portugal)[1]; José Pedro Neves (Portugal)[1]

1 - Hospital de Santa Cruz, Centro Hospitalar de Lisboa Ocidental

Introduction: Obesity is a rising global epidemic affecting 18 to 20% of the world's adult population.

The question of whether obesity is a risk factor for outcomes of coronary artery bypass graft (CABG) surgery has been frequently addressed in the past years. Despite obesity is conventionally perceived as a negative issue for perioperative morbidity and mortality, literature shows contradictory results, with some studies reporting better prognostic outcomes following revascularization for these patients, what is called "obesity paradox".

Objectives: Evaluate the impact of obesity after CABG on long-term follow-up.

Methods: Single center retrospective study of all consecutive patients submitted to isolated CABG from 2009 to 2014 (N= 1521). Exclusion criteria: emergent procedures (26), previous cardiac surgery (28), patients with BMI <18.5 kg/m2 (3) and foreigners (11). The population of study was 1453 patients. All subjects were categorized into 5 groups: normal BMI (18.5–24.9 kg/m2), overweight (25.0– 29.9), obese class I (30.0–34.9), obese class II (35.0–39.9) and obese class III (≥40.0). Primary end-point: all-cause mortality; secondary end-point: repeat revascularization (CABG or PCI). Mean follow-up time was 78,6 (PD 30,7; min 0; max 126) months. Logistic regression and Cox proportional analysis were used according with BMI groups and other clinical relevant variables selected a priori. Long-term survival was estimated using the Kaplan-Meier method.

Results: On univariate analysis, overweight (HR 0,58; CI95%:0,46-0,74; p<0,001) and obese class I (HR 0,68; CI95%:0,51-0,91; p<0,01) were associated with reduced risk of long-term mortality. There was no significant statistical association between obese class II and III and mortality. On multivariate analysis, there is still association with overweight (HR 0,59; CI95%:0,47-0,76; p<0,001) and obese class I (HR 0,66; CI95%:0,49-0,89; p=0,007) with reduced mortality. This analysis also showed that DM (HR 1,45; CI95%:1,17-1,81; p=0,001), HBP (HR 1,40; CI95%:1,01-1,93; p=0,042), Previous HD (HR 2,14; CI95%:1,30-3,51; p=0,003), Reduced EF (HR 1,71; CI95%:1,38-2,13; p<0,001) and incomplete revascularization (HR 1,71; CI95%:1,38-2,13; p<0,001) were predictors of late mortality. Overweight or obesity (all classes) were not statistically associated with need for repeat revascularization, on uni or multivariable analysis. On late one, having a myocardial infarction until 1 week before CABG (OR 2,1; CI95%:1,14-3,86; p=0,017) was a risk factor for repeat revascularization.

Conclusion: In this retrospective study, overweight and mild obesity were associated with lower mortality after coronary revascularization at long-term follow-up. Moderated and morbid obesity are no risk factors following CABG. More data are needed to explain this remaining paradox.

TRANSLATIONAL MEDICINE

ORAL COMMUNICATIONS

MT01-26028
GATHERING PHENOTYPE-GENOTYPE DATA IN HFPEF STUDIES

João Rafael Almeida (Portugal)[1]; Pedro Freire (Portugal)[1]; José Luís Oliveira (Portugal)[1]

1 - DETI / IEETA, University of Aveiro, Aveiro, Portugal

The NETDIAMOND project aims to study patients with heart failure with preserved ejection fraction (HFpEF), involving several health professionals from different institutions with different roles in the study.
This raises two essential issues: 1) the data storage and management required to make the follow-up accessible; and 2) the data access from the different entities, which have different permissions and that need to be controlled.
Regarding these issues, we propose a web system to record patient information in clinical studies, which is focused on a cohort of HFpEF patients. The system was designed to easily create a data schema based on groups of clinical data. For each group, the different institutions involved can read/edit the data of their patients. In the end, all data is combined as a unique dataset, with harmonised concepts and data structure. Additionally, there is an infrastructure to manage which entities can access each of these groups. This management is performed by a study manager using role-based access control policies at different levels.
The system was developed for the NETDIAMOND project as a tool to support researchers by maintaining the patient clinical data, with the capability to export and analyse that data over time. This tool effortlessly enables patient follow-up by the responsible health professionals of each dataset, and the data sharing between different organisations.
This patient management portal is publicly available, with strong access control, in the following address: https://bioinformatics.ua.pt/netdiamond/
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MT02-26060
CITED2 FUNCTION, STATE OF THE HEART

José Bragança (Portugal)[1]

1 - Universidade do Algarve

The transcriptional modulator CITED2 is required for normal embryogenesis of mice and humans, particularly for heart development. In humans, mutations in CITED2 were associated with congenital heart disease (CHD), with defects including Ventricular Septal Defect (VSD), Atrial Septal Defect (ASD), Tetralogy of Fallot (TOF) and Transposition of the Great Arteries (TGA). In mouse, the lack of Cited2 gene function resulted in lethality during gestation, and the impairment of the normal development of several tissues, including the heart and placenta, amongst others. At the molecular level, Cited2 plays an important role modulating HIF-1α activity in hypoxic cardiac structures of the developing heart during mouse embryogenesis, such as the interventricular septum, outflow tract and atrioventricular canal regions. Cited2 also interacts with transcriptional regulators Tfap2 and CBP/p300 to stimulate the expression of several genes, that contribute to the correct heart development and specification of the left-right body axis, such as Nodal, Lefty1/2, Pitx2c and Vegfa.
Using mouse Embryonic Stem Cells (ESC), we have recently evidenced that Cited2 is also required for in vitro cardiogenesis. Additionally, we have established that Cited2 is essential for ESC specification to mesoderm and for cardiogenesis. Interestingly, these cardiogenic defects caused by the loss of Cited2 function in ESC were corrected by secreted factors enriched in the secretome of ESC overexpressing CITED2. Among the secreted proteins, we have identified Wnt5a and Wnt11, which are proteins playing a critical role in cardiogenesis both in vivo and in vitro. We also demonstrated that the cardiogenic function of Cited2 is conserved in zebrafish, and its depletion at early stage of development also leads to premature lethality of zebrafish embryos, with cardiac and non-cardiac anomalies. These defects were largely recovered by microinjection of either a lipophilic recombinant human 8R-CITED2 (8 arginines fused to human CITED2 protein) or Wnt5a/Wnt11 proteins. Together, our results indicate that CITED2 function, particularly for heart development, is conserved in vertebrates, from fish to humans. Importantly, the early embryonic defects caused by CITED2 dysfunction may be amendable by exogenous supplementation of proteins such as Wnt5a/Wnt11 or agonist small molecules. Therefore, our results may offer opportunities to develop novel therapeutic strategies aiming to prevent CHD.

MT03-27062

OBESITY ALTERATIONS IN CARDIAC VISCERAL ADIPOSE TISSUE: CHARACTERIZATION IN AN ANIMAL MODEL OF OBESITY-INDUCED HFPEF

Glória Conceição (Portugal)[2]; Júlia Matos (Portugal)[1]; Nádia Gonçalves (Portugal)[2]; Daniela Miranda-Silva (Portugal)[2]; Alexandre Gonçalves (Portugal)[2]; Rita Ferreira (Portugal)[3]; Adelino Leite-Moreira (Portugal)[2]; Rui Vitorino (Portugal)[1]; Inês Falcão-Pires (Portugal)[2]

1 - Department of Medical Sciences, iBiMED, Institute for Biomedicine, University of Aveiro;
2 - Department of Surgery and Physiology, UnIC - Cardiovascular Research Centre, Faculty of Medicine, University of Porto;
3 - QOPNA, Department of Chemistry, University of Aveiro

Introduction: Heart failure with preserved ejection fraction (HFpEF) constitutes an important cause of cardiovascular mortality and morbidity reaching approximately 50% of all patients with heart failure. Metabolic-related complications, such as obesity, have been linked with pathophysiology of this complex disease. The anatomic proximity between cardiac visceral adipose tissue (CVAT) and the myocardium has gained increasing interest for its potential pathogenic role in cardiac diseases. Thus, we aimed to describe the phenotype and proteomic differences between CVAT from ZSF1 lean (control) and ZSF1 obese (HFpEF) rats and to evaluate its myocardial impact.
Methods: CVAT of 20-weeks-old lean and obese ZSF1 rats was collected for: 1) 24h DMEM incubation to obtain conditioned media, 2) separation of proteins to mass spectrometry identification, 3) adipokines' expression, 3) adipocytes fibrosis and cross-sectional area assessment. Organotypic cultures were prepared from 7 days-old Wistar Han cardiac explants and incubated for 24h with the conditioned media. After incubation, cross-section area of cardiomyocytes and fibrosis were evaluated. Cardiomyocytes were isolated from Wistar Han and incubated with conditioned media for viability studies.
Results: Conditioned media obtained from CVAT obese (CM-obese) rats significantly reduced cell viability, induced cardiomyocytes hypertrophy and fibrosis compared to the conditioned medium from lean rats CVAT (CM-lean). The analysis of the proteome of CVAT confirmed the phenotypic differences between lean and obese CVAT, showing enrichment of proteins involved in triglyceride metabolic processes in obese CVAT. In contrast, mitochondrial proteins are prominent in lean CVAT that suggest a brown adipose tissue phenotype. CVAT from lean rats presented an increase of uncoupling protein-1 (UCP-1) protein, associated with a multilocular appearance and an increased expression of brown adipose tissue markers. Contrarily, the deleterious effect imposed by CM-obese were associated with a pro-inflammatory profile as assessed by the increased expression of several pro-inflammatory adipokines. A deeper analysis of the composition of CVAT from obese rats revealed a white adipose tissue phenotype accompanied by adipocytes' hypertrophy.
Conclusion: Obesity promotes alterations in CVAT signature, structure, composition and secretion profile, which induces important myocardial consequences.

MT04-27082

MITOCHONDRIAL REVERSIBLE CHANGES DETERMINE DIASTOLIC FUNCTION ADAPTATIONS DURING MYOCARDIAL (REVERSE) REMODELING

Daniela Miranda Silva (Portugal)[1]; Patrícia Goncalves Rodrigues (Portugal)[2]; Estela Alves (Portugal)[3]; David Rizzo (Portugal)4; Ana Catarina R.G Fonseca (Portugal)[5]; Tânia Lima (Portugal)[2]; Fabiana Baganha (Portugal)[1]; Glória Conceição (Portugal)[1]; Cláudia Sousa (Portugal)[1]; Alexandre Gonçalves (Portugal)[1]; Isabel Miranda Silva (Portugal)[1]; Francisco Vasques-Nóvoa (Portugal)[1]; José Magalhães (Portugal)[4]; Adelino Leite-Moreira (Portugal)[1]; Inês Falcão-Pires (Portugal)[1]

1 - UnIC – Cardiovascular R&D Center, Department of Surgery and Physiology Faculty of Medicine University of Porto;
2 - UnIC – Cardiovascular R&D Center. Department of Surgery and Physiology Faculty of Medicine University of Porto;
3 - CIAFEL, Research Centre in Physical Activity, Health and Leisure, Faculty of Sports, Porto;
4 - CIAFEL, Research Centre in Physical Activity, Health and Leisure, Faculty of Sports, Porto, Portugal;
5 - Instituto de Investigação e Inovação em Saúde (i3S), Universidade do Porto.

Background: Often, pressure overload-induced myocardial remodelling does not undergo complete reverse remodelling after decreasing afterload. Recently, mitochondrial abnormalities and oxidative stress have been successively implicated in the pathogenesis of several chronic pressure--overload cardiac diseases. Therefore, we aim to clarify the myocardial energetic dysregulation in (reverse) remodelling, mainly focusing on the mitochondria.
Methods and Results: Thirty-five Wistar Han male rats randomly underwent sham or ascending (supravalvular) aortic banding (Ba) procedure. Echocardiography revealed that Ba induced concentric hypertrophy and diastolic dysfunction accompanied by increased oxidative stress and mitochondrial function. After 8-9 weeks, half of the Ba animals underwent overload relief by an aortic debanding surgery (Deb, n=10). Two-weeks later, hypertrophy decreased with the decline of oxidative stress and DD improved

simultaneously. The reduction of energetic demands imposed by overload relief allowed the mitochondria to reduce its activity and myocardial levels of [PCr], [PCr/ATP] and [ATP/ADP] to normalize in Deb towards Sham values. Despite the decreased of mitochondrial area, Complex III and V expression increased in Deb compared to Sham or Ba. Autophagy and mitophagy-related markers increased in Ba and remained higher in Deb rats.

Conclusion: During compensatory and maladaptative hypertrophy, mitochondria become more active. However, as the disease progresses, the myocardial energetic demands increase, and the myocardium becomes energy deficient. During reverse remodelling, the concomitant attenuation of cardiac hypertrophy and oxidative stress allowed myocardial energetics, left ventricle hypertrophy and diastolic dysfunction to recover. Autophagy and mitophagy are probably involved in the myocardial adaptation to overload and to unload. We conclude that these mitochondrial reversible changes underlie diastolic function adaptations during myocardial (reverse) remodelling.

MT05-27105
MICRORNA-146A ROLE IN THE PATHOPHYSIOLOGY OF PULMONARY ARTERIAL HYPERTENSION

Sónia Miranda (Portugal)[1]; Pedro Mendes-Ferreira (Portugal)[1]; Rui Adão (Portugal)[1]; Carolina Maia-Rocha (Portugal)[1]; Diana Santos-Ribeiro (Portugal)[1]; Luís Pimentel (Portugal)[1]; Cláudia Monteiro-Pinto (Portugal)[1]; Steeve Provencher (Canada)[2]; Sébastien Bonnet (Canada)[2]; Adelino Leite-Moreira (Portugal)[1]; Carmen Brás-Silva (Portugal)[1]

1 - UnIC- Unidade de Investigação Cardiovascular, Faculdade de Medicina da Universidade do Porto;
2 - Pulmonary Hypertension Research Group, Institut universitaire de cardiologie et de pneumologie de Québec, Laval University

Introduction: Pulmonary arterial hypertension (PAH) is characterized by excessive pulmonary vascular remodelling, resulting in elevated pulmonary vascular resistances and right ventricle (RV) overload and failure. PAH remains incurable, and new therapeutic approaches are required. MiR-146a promotes vascular smooth muscle cell proliferation and vascular neointimal hyperplasia, both important hallmarks of PAH. Additionally, MiR-146a represses several signalling pathways which could play a major role in PAH.

Aim: To investigate MicroRNA-146a role in the pathophysiology of PAH and RV heart failure (HF).

Methods: Human RV samples were obtained from autopsies, heart transplantation or cardiac surgery, and categorized as normal RV (NRV), compensated RV hypertrophy (CRV) and decompensated RVHF (DRV). Lung tissue samples were collected from explanted lungs or during lung resection from healthy segments. Pulmonary artery smooth muscle cells (PASMC) were isolated from PAH patients and treated with miR-146a inhibitor. Wild-type (WT) and miR-146a knock-out (miR-146a-/-) mice were submitted to either 3 weeks of chronic hypoxia-induced PAH with weekly Sugen 5416 administration (SuHx) or pulmonary artery banding (PAB)-induced RV hypertrophy.

Results: MiR-146a expression was increased in the RV of patients with DRV when compared to NRV. This increase was inversely correlated with decreased RV function. Lung tissue from PAH patients showed an increase in miR-146a levels when compared to controls, and the same was observed in isolated PASMC. PAH-PASMC treated with miR-146a inhibitor showed decreased proliferation and increased apoptosis compared to non-treated cells. MiR-146a-/- mice developed significantly decreased RV hypertrophy in both SuHx and PAB models, and showed decreased RV dilation secondary to PAB.

Conclusions: MiR-146a expression is increased in both the RV and Lung of PAH patients, and its deletion in animal models results in decreased RV hypertrophy, suggesting that this miRNA plays an important role in the pathophysiology of PAH and might be a therapeutic target in this condition.

MT06-27113
ENDOTHELIAL DYSFUNCTION IN THE CONTEXT OF HEART FAILURE WITH PRESERVED EJECTION FRACTION

Inês Tomé (Portugal)[1]; Patrícia Pitrez (Portugal)[2]; Glória Conceição (Portugal)[3]; Francisco Nóvoa (Portugal)[3,4,5,6,7]; Nádia Gonçalves (Portugal)[3]; Henrique Girão (Portugal)[1]; Inês Falcão-Pires (Portugal)[3]; Diana Nascimento (Portugal)[6,7]; Perpétua Pinto-Do-Ó (Portugal)[6,7,8]; Adelino Leite-Moreira (Portugal)[3,7]; Lino Ferreira (Portugal)[1,2]

1 - Biomaterials and Stem Cell-Based Therapeutics Laboratory, Faculty of Medicine, University of Coimbra, Coimbra, Portugal;
2 - Biomaterials and Stem Cell-Based Therapeutics Laboratory, Centre for Neurosciences and Cell Biology, University of Coimbra, Coimbra, Portugal;
3 - Department of Surgery and Physiology, Faculty of Medicine, University of Porto, Porto, Portugal;
4 - Department of Internal Medicine, Faculty of Medicine, São João Hospital Centre, Porto, Portugal;
5 - Department of Medicine, Faculty of Medicine of Porto, Porto, Portugal;
6 - Institute for Research and Innovation in Health (i3S), University of Porto, Porto, Portugal;
7 - Institute of Biomedical Engineering (INEB), University of Porto, Porto, Portugal;
8 - Abel Salazar Institute of Biomedical Sciences of (ICBAS), University of Porto, Porto, Portugal

Heart failure, a progressive syndrome linked to ageing, affects 26 million individuals worldwide (Savarese, G. et al. 2017). Half of this patients have preserved ejection fraction (HFpEF) and this number is increasing (Dhingra, A. et al. 2014). Pathophysiology of HFpEF has been proposed as result of high prevalence of comorbidities that induce a systemic pro-inflammatory state and, consequently, coronary microvascular endothelial dysfunction (Paulus, W. et al. 2013). The latter, causes cardiomyocyte hypertrophy and interstitial fibrosis, promoting high diastolic left ventricular stiffness. So far, it is not completely understood the mechanism behind endothelial inflammation and dysfunction in HFpEF. To evaluate the expression of inflammatory and oxidative stress markers, conditioned media (CM) from ZSF1 rats (Lean and Obese), as well as serum obtained from HFpEF patients and healthy volunteers, were exposed to normal endothelial cells (ECs). Both ZSF1-Obese CM and serum from HFpEF patients induced normal ECs to a phenotype of inflammation and oxidative stress, characterized by E-selectin and VCAM-1 upregulation, and eNOS downregulation in the first 10 h of exposure. Moreover, only ZSF1--Obese rats and HFpEF patients showed an overexpression of the same adhesion molecules at the heart, both at the endothelium and other regions of the heart tissue, indicating a general inflammation response. We also investigated cell senescence in HFpEF, given its strongly relation with inflammation. Preliminary results indicated a link between inflammation and cell senescence, which might lead to a new paradigm for the treatment of HFpEF.

MT07-27114

EXTRACELLULAR-MATRIX FUNCTIONALIZATION OF HUMAN IPSC-BASED CARDIAC TISSUES IMPROVES CARDIOMYOCYTE MATURATION

Henrique V. Almeida (Portugal)[1,2,3]; Miguel Tenreiro (Portugal)[1,2]; Filipa Louro (Portugal)[1,2]; Bernardo Abecasis (Portugal)[1,2]; Deolinda Santinha (Portugal)[3]; Tomás Calmeiro (Portugal)[4]; Elvira Fortunato (Portugal)[4]; Lino Ferreira (Portugal)[3]; Paula M Alves (Portugal)[1,2]; **Margarida Serra** (Portugal)[1,2]

1 - iBET, Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2781-901 Oeiras, Portugal;
2 - Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Av. da República, 2780-157 Oeiras, Portugal;
3 - CNC, Centro de Neurociências e Biologia Celular, Universidade de Coimbra, 3004-517 Coimbra, Portugal;
4 - CENIMAT|i3N, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia, Universidade NOVA de Lisboa, Campus de Caparica, 2829-516 Caparica, Portugal

Cardiovascular diseases are a leading cause of death and morbidity, therefore there is an urgent need to develop new therapeutic approaches targeting this problem. Human induced pluripotent stem cells (hiPSC) have a great potential in the development of these novel therapies due to their high self-renewal capability and potential to differentiate into specialized cells including cardiomyocytes (CM). However, generated hiPSC-derived CM (hiPSC-CM) are still immature, with phenotypic and functional characteristics that more closely resemble the fetal than the adult CM. This has been limited their application in cell therapy, in vitro cardiac disease modelling and cardiotoxicity drug screening.

Recent findings have been demonstrated the potential of the ECM as a key regulator in development, homeostasis and injury of the cardiac microenvironment in vivo. Within this context, the objective of this work was to assess the impact of human cardiac ECM in the phenotype, functionality and maturation of the hiPSC-CM.

Human ECM was isolated from the myocardium of three healthy donors (age: 60-65) through physical decellularization. The ECM was polled and cryo-milled and further characterized in terms of particle size and composition. These ECM particles were then incorporated in a 3D model of hiPSC-CM, cultured as aggregates in dynamic stirred culture. hiPSC-CM were characterized in terms of phenotype, structure and functionality after 2 weeks of culture.

Our results showed that cardiac tissue decellularization process reduced DNA content (>75%) while maintained ECM composition. SEM and AFM analyses indicated that tissue milling breaks down tissue into micrometric sized particles (average of 4.3 μm) with a spherical-like shape and irregular surface topography. The Cardiac ECM particles were successfully incorporated in 3D hiPSC-CM aggregates (ECM+hiPSC-CM), with no impact on cell morphology, aggregate size, composition and metabolic activity. Noteworthy, ECM+hiPSC-CM aggregates showed beating rates closer to physiologic values, more organized and longer sarcomeres and improved calcium handling, when compared to standard hiPSC-CM aggregates.

This work shows for the first time that human cardiac ECM promotes the structural and functional maturation of hiPSC-CM. The knowledge generated provides important insights to strength the application of hiPSC-CM in cell therapy, drug discovery and cardiac disease modeling.

MT08-27063
EHD1 PROMOTES LATERALIZATION OF THE GAP JUNCTION PROTEIN CX43 IN THE ISCHEMIC HEART

Tânia Martins-Marques (Portugal)[1]; Steve Catarino (Portugal)[1]; Alexandre Gonçalves (Portugal)[2]; Inês Falcão Pires (Portugal)[2]; Henrique Girão (Portugal)[1]

1 - Faculdade de Medicina, Universidade de Coimbra;
2 - Faculdade de Medicina, Universidade do Porto

Myocardial infarction is acknowledged as the main etiology of heart failure (HF), posing as a major cause of morbidity and mortality in developed countries. In fact, myocardial ischemia has been demonstrated to cause both systolic and diastolic dysfunction, being frequently regarded as a major underlying pathogenic factor in both HF with reduced ejection fraction (HFrEF) and preserved ejection fraction (HFpEF). An efficient communication between heart cells is vital to ensure a correct anisotropic propagation of the electrical impulse, a function that is mainly conducted by gap junctions (GJ). Expectedly, dysfunctional GJ-mediated intercellular communication has been associated with several cardiac disorders. Besides acute Cx43 alterations in the setting of myocardial ischemia, altered distribution and function of GJ channels has been strongly associated with HF progression. Previous studies from our lab showed that Cx43-channels are degraded by autophagy during heart ischemia and ischemia/reperfusion. However, the molecular mechanisms underlying the redistribution of Cx43-GJ and its contribution to the development of HF are not fully understood. Recently, in a proteomic analysis, we showed that ischemia promotes interaction of Cx43 with Eps15 homology domain-containing protein 1 (EHD1) in rat hearts. Given that EHDs have been implicated in pathological trafficking of cardiac ion channels and transporters, the main objective of the present study was to investigate the role of EHD1 on ischemia-induced remodelling of GJ.
We used ex vivo Langendorff-perfused rat hearts and human biopsies to evaluate the association of EHDs with Cx43. To gain further mechanistic insights, we performed genetic manipulation of EHD1 in cell-based models. Our results show that co-localization of EHDs with mislocalized Cx43-channels increased in diseased hearts. In addition, knockdown of EHD1 increased the amount of plasma membrane-localized Cx43 and preserved GJ-mediated intercellular communication in HL-1 cells. Additionally, we demonstrated that interaction of Cx43 with EHD1 can be promoted by increased Cx43 phosphorylation and ubiquitination. Overexpression of EHD1 increased localization of Cx43 into early endocytic compartments, and exacerbated ischemia-induced lateralization of Cx43 in isolated adult cardiomyocytes.

Overall, we identified EHDs as novel players on pathological remodelling of GJ, by transiently associating with Cx43 during myocardial ischemia, which might open new avenues towards the establishment of therapeutic strategies to prevent ischemia-induced arrhythmias and progression into HF.

MT09-27116
ROLE OF CCBE1 IN THE CROSS-REGULATION BETWEEN ENDOTHELIAL CELLS AND CARDIOMYOCYTES IN CARDIOGENESIS: FROM DEVELOPMENTAL BIOLOGY TO REGENERATIVE MEDICINE APPROACHES

Fernando Bonet (Portugal)[1]; Oriol Bover (Portugal)[1]; José M. Inácio (Portugal)[1]; **José A. Belo** (Portugal)[1]

1 - Stem Cells and Development Laboratory, CEDOC, Chronic Diseases Research Centre, NOVA Medical School|Faculdade de Ciências Médicas, Universidade NOVA de Lisboa, Lisboa, Portugal

Given that cardiovascular disease is a significant cause of death worldwide, there is a critical need to fully understand heart development and regeneration, namely the regulatory interactions between cardiomyocytes and non- cardiomyocytes. We show that CCBE1 is necessary for correct coronary vessel development. Ccbe1-deficient mice exhibit defects in dorsal coronary growth that sprouts from the SV endocardium. This disruption of coronary formation correlates with abnormal processing of VEGF-C pro-peptides, indicating a VEGF-C-dependent signalling alteration. Moreover, Ccbe1 loss-of-function leads to the development of defective dorsal and ventral intramyocardial vessels, suggesting a VEGF-C independent activity. In accordance with the lack of coronary endothelium, Ccbe1 mutant hearts also display a noncompaction phenotype with decreased cardiomyocyte proliferation.
We also found that Ccbe1 is markedly enriched in Isl1--positive cardiac progenitors isolated from differentiating ESCs and from embryonic hearts developing in vivo. Knock-down of Ccbe1 activity impaired differentiation of embryonic stem cells along the cardiac mesoderm lineage. To address the paracrine role of Ccbe1 in the development of new vascular networks in vitro, we used ES Cell-derived Endothelial Precursor Cells (EPC) cocultured with mouse embryonic fibroblasts from both wild type and Ccbe1-KO mice in the form of spheroids. Using this approach, we could uncover the potential role of CCBE1
in both VEGF-C-dependent and -independent endothelial

cell specification and/or maturation and consequently, vessel formation.
In conclusion, our results show that Ccbe1 is a significant cardiogenic gene essential for the commitment of cardiovascular precursors (both myocytes and non-myocytes), and important in processes like coronary vasculature development and proper ventricular compaction. This shed light on the regulatory mechanisms necessary for future therapeutic cardiac revascularization and regeneration.

MT10-27084
FUNCTIONAL ANALYSIS OF TWO NOVEL TBX5 MUTATIONS PRESENT IN HOLT-ORAM SYNDROME PATIENTS WITH DIFFERENT CLINICAL MANIFESTATIONS

Débora Varela (Portugal)[1]; Tatiana Varela (Portugal)[1]; Natércia Conceição (Portugal)[1,3,4]; Ângela Ferreira (Portugal)[2]; Nuno Marques (Portugal)[3,4,5]; Ana Silva (Portugal)[2]; Pedro Azevedo (Portugal)[5]; Salomé Pereira (Portugal)[5]; Ana Camacho (Portugal)[5]; Ilídio Jesus (Portugal)[5]; M.Leonor Cancela (Portugal)[1,3,4]

1 - Centre of Marine Sciences (CCMAR), University of Algarve, Faro, Portugal;
2 - Algarve Prenatal Diagnostic Center and Obstetrics & Gynecology Service, Algarve Hospital University Center (CHUA), Faro, Portugal;
3 - Department of Biomedical Sciences and Medicine, University of Algarve, Faro, Portugal;
4 - Algarve Biomedical Centre, University of Algarve, Faro, Portugal;
5 - Cardiology Department, Algarve Hospital University Center (CHUA), Faro, Portugal

The Holt-Oram syndrome (HOS), also called heart-hand syndrome, is a rare congenital genetic condition with an autosomal dominant transmission. Although being a highly penetrant pathology, its clinical manifestations vary considerably, with greater or lesser severity. HOS patients exhibit congenital cardiac defects including atrial and/or ventricular septal defects and cardiac conduction problems, as well as malformations in the upper limbs, affecting the preaxial radial ray. Mutations in TBX5 gene are, so far, the only known cause of HOS, although about 30% of patients do not have mutations in its coding sequence or intron-exon junctions. TBX5 encodes a transcription factor (518 amino acids) important for the heart and skeletal development. It remains controversial if it will be possible to define a direct association between the HOS clinical features and the type/location of the TBX5 mutation. The main goal of this work was to assess the functional consequence of two novel TBX5 mutations, identified in two HOS patients from the University Hospital Centre of the Algarve. The patient with the c.905delA mutation presents a severe cardiac phenotype and less severe skeletal defects unlike the patient with the c.246_249delGATG mutation that displays a very mild cardiac problem but severe upper limbs malformations. The functional effect of these mutations was evaluated, through an in vitro system, by analysing the subcellular localization of the mutated TBX5 proteins using an immunocytochemistry assay, as well as its capability to activate the transcription of its cardiac-related downstream target, NPPA, using a luciferase reporter assay system. Both frameshift mutations, c.905delA and c.246_249delGATG lead to the production of shorter TBX5 proteins, p.Gln302Argfs*91 and p.Met83Phefs*6, of 392 and 87 amino acids, respectively. Immunofluorescent staining showed that the p.Gln302Argfs*91 TBX5 mutant is mainly localized in the nucleus, similar to the wildtype protein localization, unlike the p.Met83Phefs*6 mutant that displayed a higher level of cytoplasm localization in comparison with the wildtype protein. Luciferase activity analysis revealed that both mutant TBX5 were not capable of transactivating the NPPA promoter, when compared to its wildtype counterpart.
In conclusion, our results provide evidence that both mutations cause a severe TBX5 loss-of-function and therefore, dramatically reduced its biological activity as a transcription factor. Further studies are required to understand the differential effects in the phenotype.

MT11-27115
GENERATION AND FUNCTIONAL CHARACTERIZATION OF CARDIOMYOCYTES DERIVED FROM A SET OF ISOGENIC, GENE-EDITED HUMAN IPS CELL LINES DERIVED FROM A CERL2/DAND5 PATIENT FOR CARDIAC DISEASE MODELLING

José M. Inácio (Portugal)[1]; Fernando Cristo (Portugal)[1]; Mafalda Silva (Portugal)[1]; Micael Almeida (Portugal)[1]; Mariana Faria (Portugal)[1]; **José A. Belo** (Portugal)[1]

1 - Stem Cells and Development Laboratory, CEDOC, Chronic Diseases Research Centre, NOVA Medical School|Faculdade de Ciências Médicas, Universidade NOVA de Lisboa, Lisboa, Portugal

Cardiovascular diseases are the leading cause of mortality in developing countries. Identifying and studying the developmental and cellular pathways involved in heart formation

could inspire novel regenerative treatments. The Nodal signalling pathway is a key regulator of the establishment of the Left-Right axis. Defects in this signalling pathway leads to laterality defects with frequently associated Congenital Heart Diseases (CHDs).
Cerl2/Dand5 is a master regulator of Nodal signalling. Cerl2/Dand5 KO mouse displays a unique phenotype leading to thickening of the cardiac body walls due to cardiomyocyte hyperproliferation. Once that understanding the molecular pathways regulating cardiogenesis is crucial for the early diagnosis of heart diseases, we analysed a cohort of 38 patients with CHD that can arise from initial perturbations in the formation of the Left-Right axis. We found two patients with CHD with a DAND5 heterozygous non-synonymous variant in the functional domain of the DAND5 protein. Functional analysis assay showed a significant decrease in the activity of this variant protein when compared to its wild-type counterpart.
We set up to model this genetic defect and its role in cardiomyocyte proliferation by generating iPS cells from these patients and family controls. After generation and validation of those iPS cell lines we also generated a full tool-box of other iPS cell lines to better study this signalling pathway: using the CRISPER/Cas9 technology, we generated disease-corrected and full DAND5-KO iPS cell lines.
With this full set of iPS cell lines, we analysed the role of DAND5 in terms of proliferation and function of iPS cell-derived cardiomyocytes. Preliminary analysis show that cardiomyocyte proliferation is indeed increased in the patient's iPS cell-derived cardiomyocytes. Careful analysis of the effects on the Wnt and Nodal signalling pathways and functional physiology assays will also be reported.
With this work, we aim to uncover and refine the roles of Cerl2/DAND5 in the regulation of the signalling mechanisms underlying cardiomyocyte proliferation in vitro and in vivo using both these iPS cell lines and isolated mouse Cerl2-KO ES cells.

Saturday, November 23th, 5:00 p.m.

SHORT COMMUNICATIONS

MT12-26029

A COMPUTATIONAL PIPELINE FOR MULTIPLE COHORT ANALYSIS

João Rafael Almeida (Portugal)[1]; Pedro Freire (Portugal)[1]; José Luís Oliveira (Portugal)[1]

1 - DETI / IEETA, University of Aveiro, Aveiro, Portugal

The increasing complexity of clinical studies, especially the ones with multifarious pathophysiology, demand for new processing approaches where omic analysis are mixed with observational data to provide more precise treatments. The NETDIAMOND project aims the discovery of unravelling pathophysiology in HFpEF by mixing the patient clinical data with their biomarkers from heart tissues.
Although having big datasets is currently something desired by researchers, there are situations where the interesting data is only in a part of this dataset. Therefore, the collected data needs to be analysed and filtered based on specific medical conditions.
To address this issue, we propose a data transformation pipeline which maps cohorts raw data into an analytical format. At the end of this pipeline, several open-source tools, such as TranSMART, can be used to store and study the clinical and omics parameters collected in research.
This analytical web application can accelerate the discoveries within complex biological data using statistical operations and the capability of extending the tool to user data mining algorithms as an add on.
The proposed pipeline was validated in several Alzheimer disease cohorts and can be replicated in any disease.

MT13-26030

MERGING MICROARRAY STUDIES TO IDENTIFY A COMMON GENE EXPRESSION SIGNATURE IN HEART DISEASE

José Luís Oliveira (Portugal)[1]; **Olga Fajarda** (Portugal)[1]; Sara Duarte-Pereira (Portugal)[2]; Raquel M. Silva (Portugal)[2]

1 - DETI / IEETA, University of Aveiro, Aveiro, Portugal;
2 - DCM / iBiMED, University of Aveiro, Aveiro, Portugal

Heart disease is the leading cause of death worldwide.

Knowing a gene expression signature common in distinct heart diseases can lead to the identification of biomarkers, development of more efficient treatments, and prevent premature deaths. A large amount of microarray data is available in public repositories and can be used to identify differentially expressed genes (DEGs) in heart disease. However, most of the microarray datasets are composed of a reduced number of samples, and to obtain more reliable results, the datasets should be merged before the analysis. However, this is a challenging task, since datasets are originated using different platforms, and different experiments introduce batch effect, i.e. non-biological variation, to the data.

The identification of DEGs is commonly done using statistical methods. However, these methods are based on the definition of an arbitrary threshold to select DEGs and there is no consensus on the values that should be used.

The objective of this study was to identify a common gene expression signature in heart disease. To achieve that goal, we used nine publicly available microarray datasets from studies of different heart diseases, and which were generated using four different Affymetrix platforms. We merged the datasets using only the common GenBank sequence accession identifier across the different platforms and obtained a new dataset with 689 samples and 8354 features (the common GenBank identifiers). Subsequently, we used the R/Bioconductor software package limma to determine the adjusted p-value and the fold change. A set of adjusted p-values cutoffs combined with a list of different fold change threshold were used to obtain 14 sets of DEGs. To batch-adjust the gene expression data of the merged dataset we used the ComBat method. Finally, we applied a supervised learning algorithm (random forest) to select the genes that have the best accuracy in classifying samples from patients with heart diseases and sample from patients with no heart condition.

We identified a set of 64 DEGs which has a classification accuracy of approximately 96%. It is worth noticing that the smallest DEGs set has 7 genes and has a classification accuracy of approximately 93%. This set includes, for example, NPPA (natriuretic peptide A), which is a heart failure marker. Future validation of these genes as early markers of heart disease could be clinically relevant.

MT14-26031

UNRAVELING THE EFFECT OF EXERCISE TRAINING IN THE SKELETAL MUSCLE/ADIPOSE TISSUE AXIS IN EXPERIMENTAL HEART FAILURE WITH PRESERVED EJECTION FRACTION

Rita Nogueira-Ferreira (Portugal)[1]; Rita Ferreira (Portugal)[2]; Inês Chaves-Santos (Portugal)[2]; Eliane Jaconiano (Portugal)[1]; André Lourenço (Portugal)[1]; Inês Falcão-Pires (Portugal)[1]; Adelino Leite-Moreira (Portugal)[1]; Daniel Moreira-Gonçalves (Portugal)[1,3]

1 - UnIC, Department of Surgery and Physiology, Faculty of Medicine, University of Porto;
2 - QOPNA & LAQV, Department of Chemistry, University of Aveiro;
3 - CIAFEL, Faculty of Sport, University of Porto

Introduction: Heart failure with preserved ejection fraction (HFpEF) accounts for approximately half of the HF cases. This complex disorder is associated with several comorbidities and advanced age. Until now, no effective therapy has been found. Exercise training has been reported to improve exercise tolerance and quality of life in HFpEF patients but the mechanism remain unknown.

Aims: To study the molecular changes promoted by exercise training in an animal model of HFpEF.

Methods: Three experimental groups were established: ZSF1 lean rats (ZSF1 Ln), ZSF1 obese rats (an animal model of HFpEF) (ZSF1 Ob) and ZSF1 obese rats submitted to an exercise training protocol (ZSF1 Ob + Ex) consisting in treadmill running, 4 weeks, 5 days/week, 1 h/day at 15 m/min. At the end of the experimental protocol, plasma, gastrocnemius muscle and visceral adipose tissue were collected for biochemical analysis.

Results: ZSF1 Ob rats showed a significant increase in body weight and heart mass, as well as a significant decrease in gastrocnemius muscle mass ($p<0.01$ vs ZSF1 Ln). Exercise training did not induce significant alterations in body weight, heart and gastrocnemius mass. Regarding plasma biochemical evaluations, ZSF1 Ob rats presented a significant increase in leptin expression, triglycerides and IL-6 levels and a significant decrease in irisin expression ($p<0.05$ vs ZSF1 Ln). Exercise training significantly decreased leptin and IL-6 plasma content in ZSF1 Ob animals ($p<0.01$ vs ZSF1 Ob). At the level of gastrocnemius muscle, exercise training promoted a significant increase in ATP synthase protein expression in ZSF1 Ob + Ex animals ($p<0.05$ vs ZSF1 Ln). Moreover, the expression of complexes I, II, III and IV from mitochondrial respiratory chain were also significantly increased by exercise training in ZSF1 Ob + Ex animals ($p<0.05$ vs ZSF1 Ln), while only the expression of

complex III was increased in ZSF1 Ob animals ($p<0.05$ vs ZSF1 Ln). In addition, the expression of complex IV and ETFDH were significantly increased in ZSF1 Ob + Ex animals in comparison to ZSF1 Ob animals ($p<0.05$). The alterations observed seem to be independent from mitochondrial content, since no changes in citrate synthase activity were observed between the experimental groups. At the adipose tissue level, exercise training induced a significant increase in the expression of UCP1, HSL and PGC-1α in ZSF1 Ob + Ex animals.

Conclusion: Our results support the beneficial role of exercise training in HFpEF by modulating systemic inflammation, as well as skeletal muscle and adipose tissue metabolism.

MT15-26032
A COLLABORATIVE DATA REPOSITORY FOR COHORT MANAGEMENT

Pedro Freire (Portugal)[1]; João Almeida (Portugal)[1]; José Luís Oliveira (Portugal)[1]

1 - DETI / IEETA, University of Aveiro, Aveiro, Portugal

Heart failure is one of the main causes of hospitalization and disability amongst the elderly population, where, many of these events are associated with preserved ejection fraction (HFpEF). The NETDIAMOND project sets forth to address this issue through comprehensive multi-omics studies in plasma and tissues from HFpEF patients and animal models.

This joint effort between different disciplines generates large and dissimilar volumes of data. These data formats can differ from a wide range of types (EHR's notes, clinical trial results, medical images and genomics data files), but each holds important information on both content and metadata. Due to their high complexity and structure variety, a data repository with enhanced search features able to execute full-text searches through metadata and raw data are mandatory.

We have built a collaborative solution where researchers and other professionals, may easily publish, manage, and share different types of biological and medical data. Based on Alfresco, the implemented solution, gives the possibility to execute complex searches for patient data with extended support for genomics files, allowing researchers to search also for specific genomic sequences.

MT16-26036
THE IMPACT OF CHRONIC SILDENAFIL SUPPLEMENTATION IN EXPERIMENTAL HEART FAILURE WITH PRESERVED EJECTION FRACTION

Liliana Moreira-Costa (Portugal)[1]; Sara Leite (Portugal)[1]; Rui Cerqueira (Portugal)[1,2]; Francisco Vasques-Nóvoa (Portugal)[1]; Adelino F. Leite-Moreira (Portugal)[1,2]; André P. Lourenço (Portugal)[1,3]

1 - Department of Surgery and Physiology, Faculty of Medicine, University of Porto, Porto, Portugal;
2 - Department of Cardiothoracic Surgery, São João Hospital Centre, Porto, Portugal;
3 - Department of Anaesthesiology, São João Hospital Centre, Porto, Portugal

Introduction: Heart failure with preserved ejection fraction (HFpEF) is a syndrome with complex pathophysiology that already accounts for more than 50% of HF cases. However, there are still no evidence-based therapeutic strategies to treat these patients. Although decreased protein kinase G (PKG) activity was proposed as a potential therapeutic option, results from randomized clinical trials with type-5 phosphodiesterase inhibitors (PDE5i) were discouraging. Whether specific subgroups of HFpEF patients may benefit from PDE5i remains to be defined.

Aim: Our aim was to test chronic sildenafil (SIL) therapy in the young male ZSF1 obese rat model of HFpEF with severe hypertension and metabolic syndrome.

Methods: Sixteen-week-old male ZSF1 obese rats were randomly assigned to receive SIL 100 mg.Kg-1.d-1 dissolved in drinking water (ZSF1 Ob SIL, n=8), or placebo (ZSF1 Ob PL, n=8). A group of healthy Wistar-Kyoto rats served as control group (WKY, n=8). Four weeks later animals underwent peak and endurance effort tests, haemodynamic evaluation under anaesthesia, vascular function assessment by aortic ring preparation, and left ventricular (LV) adenosine triphosphate (ATP) quantification.

Results: ZSF1 Ob PL rats showed systemic hypertension and increased aortic and LV end-diastolic stiffness, with preserved ejection fraction compared to WKY. We also observed a decrease of their endurance capacity, as assessed by total workload and peak O2 consumption (VO2). In addition, LV ATP levels were also decreased. Chronic SIL supplementation attenuated hypertension and decreased aortic and LV stiffness, modestly enhancing effort tolerance with a concomitant increase in peak VO2 and LV ATP levels.

Discussion: Our results showed that chronic treatment with SIL effectively attenuated hypertension, preserved LV end-diastolic function and aortic vascular compliance, as

well as improved endurance effort test performance and restored LV ATP levels.
Conclusion: In conclusion, chronic SIL therapy showed beneficial cardiovascular effects in this young male with poorly controlled comorbidities animal model of HFpEF, which support the implementation of clinical trials with PDE5i in HFpEF patient subgroups with similar features.

MT17-26042
MODERATE ALCOHOL CONSUMPTION PROMOTES REMODELING OF THE RIGHT VENTRICLE AND PULMONARY ARTERY IN WISTAR RATS

Ana Filipa Silva (Portugal)[1,5]; Gabriel Faria-Costa (Portugal)[1,5]; Fábio Sousa Nunes (Portugal)[1,5]; Tiago Henriques-Coelho (Portugal)[1]; Daniel Moreira-Gonçalves (Portugal)[2]; Rita Negrão (Portugal)[3,4]

1 - Unidade de Investigação Cardiovascular - Faculdade de Medicina da Universidade do Porto;
2 - Centro de Investigação em Atividade Física, Saúde e Lazer - Faculdade de Desporto da Universidade do Porto;
3 - Unidade de Bioquímica - Faculdade de Medicina da Universidade do Porto;
4 - Instituto de Investigação e Inovação em Saúde - Universidade do Porto;
5 - Departamento de Cirurgia e Fisiologia - Faculdade de Medicina da Universidade do Porto

Introduction: Observational studies suggest that moderate alcohol consumption might be beneficial in reducing cardiovascular disease risk and mortality. However, the molecular mechanisms by which alcohol influences cardiac function are poorly explored and focused primarily on the left ventricle.
Aims and methods: The aim of this study was to evaluate the bi-ventricular impact of daily moderate alcohol intake in male Wistar rats. Rats were allowed to drink water (Control) or a 5.2% ethanol (ETOH) mixture drink during 4 weeks. At the end of the protocol, rats were submitted to hemodynamic evaluation and samples from the heart and lungs were collected for histological and molecular studies. Results and discussion: ETOH ingestion did not cause any measurable alteration in the left ventricle. However, it caused 15% increase in right ventricle (RV) weight/tibia length ratio ($p<0.05$ vs. Control) and 13% increase in the RV cardiomyocyte hypertrophy ($p<0.0001$ vs. Control). The increase in RV mass was paralleled with an increase in proteins related to cell growth such as AKT (84%, $p<0.05$ vs. Control) and ERK1/2 (50%, $p<0.0001$ vs. Control) and a decrease in the proteolysis-related protein MURF-1 (23%, $p<0.05$ vs. Control). ETOH animals also presented an increased oxidative stress in the RV with a higher content of carbonylated proteins (34%, $p<0.01$ vs. Control), increased expression of NOX4 (83%, $p<0.01$ vs. Control) and decreased expression of SOD2 (51%, $p<0.01$ vs. Control). ETOH-drinking animals also presented 21% increase in pulmonary artery medial thickness ($p<0.01$ vs. Control) associated with predominance of the anti-apoptotic protein BCL-XL in relation to the pro-apoptotic protein BAX (91%, $p<0.01$ vs. Control). This was further paralleled by a decrease in the cleavage of caspase 9 (50%, $p<0.01$ vs. Control) as well as caspase-3 (61%, $p<0.001$ vs. Control).
Conclusions: Our data suggests that moderate alcohol consumption (5.2% of ethanol) was sufficient to cause RV hypertrophy and remodelling, which seems to be secondary to pulmonary vascular remodelling.

MT18-27079
DATA-FUSION AND MULTIVARIATE ANALYSIS OF MICROARRAY DATA FOR THE UNTARGETED IDENTIFICATION OF A GLOBAL AND MULTI-ETIOLOGICAL HF SIGNATURE

Sílvia O. Diaz (Portugal)[1]; Adelino Leite-Moreira (Portugal)[1]; António S. Barros (Portugal)[1]

1 - Cardiovascular Research and Development Unit (UnIC), Department of Surgery and Physiology, Faculty of Medicine, University of Porto, Porto, Portugal

Introduction: The breadth of publicly available repositories of microarrays data harbors valuable sources of information and important insights into heart failure (HF) molecular landscape. The integration of various sources of information remains a challenge but also an opportunity to leverage the robustness properties of multivariate statistical models. Data-fusion entails merging different datasets, adjusting for the batch-effect, and applying statistic modelling on the global table. It has been successfully applied to cancer research but not yet for Cardiovascular Disease (CVD).
Objectives: Leverage a data-driven approach to extract an HF gene-signature, by employing untargeted multivariate analysis, after merging microarray data available at GEO repository.
Methods: The collected microarrays were merged into a global dataset of 155 heart samples, comprising 108 multi-etiological HF (dilated CM, non-ischemic dilated CM, non-ischemic CM, ischemic CM, diabetic CM) and 47 controls. Batch correction was assessed separately using a mean correction and a Bayesian approach followed by quantile normalization, to address heterogeneity artifacts. The global dataset was analysed by PCA and PLS-DA, with recovery of the 20 most relevant (TOP20) genes distinguishing HF and

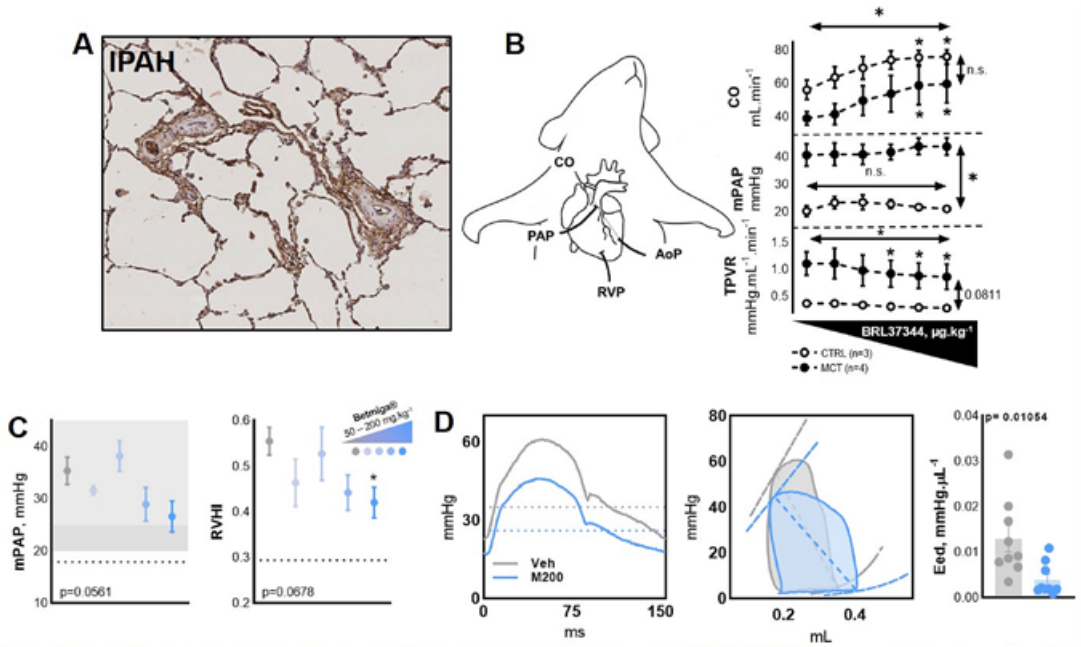
controls. A correlation network was used to identify samples/genes clusters. Based on an optimal gene set, a logistic regression model is proposed to assess the HF risk level.
Results: For BMC method the TOP20 genes comprised: NPPA, NPPB, RPS4Y1, CRYM, HSPA2, ODC1, and HTRA1 increased in HF and CCL2, PLA2G2A, FCN3, IFI30, F13A1, SELE, CD14, CCL11, VSIG4, IFITM3, ACKR1, MYOT, ANKRD2 increased in controls. For the Combat method, the captured TOP20 genes were: HTRA1 and CRYM increased in HF and CCL2, CCL11, IFI30, EMP3, HNRNPAB, RNASE2, MYOT, IFITM3, SH3BGRL3, CXCL1, FAM96B, LDHA, TBC1D10B, MID1IP1, FCN3, ACKR1, CD14, PLA2G2A increased in controls. Several of these had previously been related to CVD, as found through the DisGeNET database. A good predictive model (r2=0.83) was obtained with a 6 genes subset (HTRA1, CCL2, CXCL1, EMP3, FCN3, and HNRNPAB), optimized by stepwise backward variable selection. Internal validation yielded a 90% accuracy, 80% specificity and 92% sensitivity for this model.
Discussion: Results unveiled a putative signature of HF, mostly characterized by perturbations in inflammatory/immune processes, natriuretic system and cardiac muscle.
Conclusions: These changes are pertinent in the context of HF, mostly supported by current knowledge, showing the effectiveness of this strategy. Future work entails the combination of clinical and molecular data to optimize the statistical models and validation of this signature in other biological matrices, e.g. blood.

MT19-27083
β-3 ADRENOCEPTORS: A THERAPEUTIC TARGET FOR PULMONARY ARTERIAL HYPERTENSION

Pedro Mendes-Ferreira (Portugal)[1]; Rui Adão (Portugal)[1]; Adelino Leite-Moreira (Portugal)[1]; Carmen Brás-Silva (Portugal)[1]; Catharina Belge (Belgium)[2]

1 - Cardiovascular R&D Center, Faculty of Medicine of the University of Porto;
2 - Department of Pneumology, University Hospitals Leuven

Introduction: Pulmonary Arterial Hypertension (PAH) is an incurable disease with a poor prognosis. Currently available therapies exclusively act as pulmonary vasodilators, and only slightly increase survival. PAH is defined by a mean pulmonary arterial pressure (mPAP) >20 mmHg, a pulmonary arterial wedge pressure ≤15 mmHg and a pulmonary vascular resistance (PVR) ≥3 Wood units. It is characterized by a pre-capillary arteriopathy including vascular remodelling and plexiform lesions, resulting in increased PVR, right ventricular (RV) hypertrophy, progressive right heart failure and ultimately death. The β-3 adrenergic receptor (β3AR), thought to be restricted to adipocytes, is expressed in the heart and pulmonary vessels. Stimulating β3ARs, using approved drugs that specifically activate this receptor (mirabegron), has shown benefits in experimental left



Main Figure: B-3 adrenoreceptor activation in Pulmonary Arterial Hypertension (PAH). (**A**) B3AR is expressed in lung tissue from PAH patients. (**B**) acute administration of a B3AR agonist (BRL37344) increases cardiac output, without affecting pulmonar arterial pressures, effectivelly reducing pulmonar vascular resistances. (**C**) Chronic treatment with the clinically approved mirabegron form (Betmiga®, Astellas Pharma) decreases mean PAP and right ventricle (RV) hypertrophy (RV hypertrophy index, RVHI). (**D**) Treatment with high dose mirabegron (200 mg/kg) attenuates PAP and improves RV function, specifically RV diastolic function (decreased end-diastolic elastance, Eed).

ventricular (LV) heart failure. Despite that, it's effects in PAH are still unknown.

Hypothesis: Due to the vasoactive and cardioprotective effects of β3AR agonists, we hypothesize that activating this receptor could provide a double target effect, serving as a new treatment for PAH.

Methods: Employing a translational approach, we first quantified the expression of β3AR in pulmonary tissue from patients and rats with PAH. Using the monocrotaline (MCT)--induced PAH model, we determined the acute and chronic effects of BRL37344 and mirabegron (intravenous and orally available β3AR agonists, respectively), using telemetry (DSI dual pressure), high resolution transthoracic echocardiography (Vevo 2100) and pressure-volume analysis. Finally, we determined the effects and mechanisms of mirabegron in isolated small pulmonary arteries (myography).

Results: Both human and rat lung tissue expresses the β3AR, mainly attributed to endothelial cells, and while its expression (mRNA) was decreased in tissue from PAH patients, no differences were observed in the animal model. Acute administration of BRL37344 increased cardiac output (CO) in both control and MCT animals, without affecting PAP, reducing PVR. Treatment with mirabegron in telemetry--implanted animals was safe and resulted in increased heart rate, without affecting RV pressures or causing hypotension. An initial protocol showed no beneficial effects using low-dose mirabegron, while high dose treatment with a clinically available form (Betmiga™, Astellas Pharma) attenuated the development of MCT-induced PAH, and significantly improved RV and LV diastolic function. Finally, mirabegron induced relaxation of small pulmonary arteries, isolated from both control or MCT animals, in a β1/β2 AR-independent, and nitric oxide-dependent manner.

Conclusion: With our work, we have shown that β3AR agonists are a safe and efficient therapy for experimental PAH, opening the door for the repurposing of these drugs to PAH patients.

MT21-27086
THE AFRICAN SPINY MOUSE AS A MODEL FOR HEART REGENERATION

Marta Vitorino (Portugal)[1]; Pedro Almeida (Portugal)[2]; Lari Holappa (Finland)[4]; Anna-Kaisa Ruotslainen (Finland)[4]; Seppo Yla-Hertualla (Finland)[4]; Gustavo Tiscornia (Spain)[3]

1 - Center for Biomedical Research, University of Algarve, Faro, Portugal;
2 - Department Biomedical Sciences and Medicine, University of Algarve, Faro, Portugal;
3 - Clinica Eugin, Barcelona, Spain;
4 - Department of Biotechnology and Molecular Medicine A.I. Virtanen Institute University of Eastern Finland

The African Spiny mouse (*Acomys spp.*) is a non-traditional rodent model that is currently gaining traction for the study of tissue regeneration. While most mammals repair wounds by fibrotic scarring, *Acomys* can mount a regenerative response to wounding of several organs and tissues, including skin, kidney and musculoskeletal tissue. A number of studies have shown that, when wounded with a 4mm full-thickness punch (comprising ≥35% of the ear pinna), *Acomys* initiates cell proliferation and reconstitutes the entire tissue architecture of the ear, including cartilage, fat, muscle, vasculature, nerves, dermis and epidermis (including epidermal appendages). In contrast, *Mus musculus* simply heals the borders of the cut by fibrotic scarring. Together, these two species constitute a powerful comparative framework to understand the mechanistic basis underlying enhanced regenerative ability in mammals.

Recently, studies on heart regeneration are being developed using *A. cahirinus* as a model of regeneration. Some mammals, including *M. musculus*, have the ability to regenerate heart after injury in the first seven days after birth, but lose this capability thereafter. We are developing the *Acomys-Mus* comparative framework to address the question of whether and to what degree *Acomys* is capable of heart regeneration. We have performed a comparative study of the anatomy and function of the heart in both species, including morphology, histology and echocardiography to determine baselines for comparison. Preliminary studies indicate that *Acomys* seems to be resistant to ischemic injury and recovers quicker than *Mus*. We will present ongoing results in our work to develop the spiny mouse system as a model of cardiac regeneration, with the long--term goal of understanding the underlying molecular and cellular regenerative mechanisms and eventually translating this knowledge to the clinic.