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THORACIC SURGERY

ORAL COMMUNICATIONS

SELECTED ORAL COMMUNICATIONS
FOR THE EDUARDO ESTEVES PINTO AWARD

THORACIC SURGERY - SELECTED ORAL COMMUNICATIONS

OUTCOMES OF 500 CONSECUTIVE UNIPORTAL VIDEO-ASSISTED LOBECTOMIES

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Objectives
We present the outcomes of 500 consecutive uniportal video-assisted lobectomies performed at our department.

Materials and Methods
Between November 2013 and July 2020, 500 lobectomies (malignant lesions: 468 cases, benign lesions: 32 cases) were performed. The patients' demographics, approach and type of surgery, postoperative morbidity and mortality were analyzed.

Results
Demographical data are as follows: 216 female/284 male, mean age: 63 years (range: 16-85 years). All surgeries began by a single-port VATS approach, being necessary conversion to mini-thoracotomy in 45 procedures (conversion rate of 9%) due to bleeding and/or technical difficulties. The resected lobes showed the following distribution: right upper: 167, mid lobe: 33, right lower: 82, left upper: 111, left lower: 77, upper bilobectomy: 17; lower bilobectomy: 7. In six cases sleeve lobectomy was performed.
The median surgical time was 90 minutes (range 25-305 minutes) and median intra-operative drainage was 100ml (range 20-2100ml). Median hospitalization time was 5 days (range 2-40 days). Postoperative complication rate was 25% (with the persistent air leakage being the most frequent complication: 102 patients (20.4%). Reoperation for bleeding occurred in 7 patients (1.4%). There was no operative or 30-days mortality.
Among the 468 VATS lobectomies performed due to malignant lesions, 450 lung cancers and 18 metastases were removed. The distribution according to the stage and histology of lung cancers was as follows: 0: 5, IA: 173, IB: 148, IIA: 45, IIB: 39, IIIA: 38 and IIIB: 2; adenocarcinoma: 327, squamous cell carcinoma: 54, small cell carcinoma: 1, non-small cell lung carcinoma: 1, carcinoid: 67.

Conclusions
With the results in our institution this approach has demonstrated to be reproducible, comprising all the advantages of a minimal invasive surgery, without jeopardizing the efficiency of the oncologic treatment.
Nowadays, in our department, more than 95% of lobectomies are performed with minimally invasive technique.

THORACIC SURGERY - SELECTED ORAL COMMUNICATIONS

LYMPH NODE UPSTAGING AFTER SURGERY IN PATIENTS WITH NEGATIVE MEDIASTINAL STAGING BY EBUS

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1 - CHULN

Introduction
Mediastinal staging is a hot topic in thoracic oncology. According to the guidelines in the presence of a primary lung cancer with increased lymph node uptake on PET-CT, a negative result after lymph node sampling by EBUS is not enough to rule out mediastinal lymph node involvement, demanding a cervical mediastinoscopy to vouch for the results.

Objectives
Primary endpoint: Total percentage of lymph node surgical upstaging in patients with negative mediastinal node staging by EBUS.
Secondary endpoint: Percentage of lymph node surgical upstaging on the node stations previously sampled by EBUS.

Materials and Methods
We conducted a search in our departments database using the key-word EBUS in the period between January 2014 and August 2020. A total of 302 patients were found. We selected 42 cases after applying the following criteria: Inclusion - Primary lung cancer; Increased lymph node uptake on PET-CT; Negative EBUS; At least one of the lymph node stations sampled by EBUS explored in surgery. Exclusion - EBUS without diagnostic yield; Neoadjuvant chemotherapy.

Results
Of the 42 patients, 30 (71%) were males and 12 (29%) females. Adenocarcinoma was present in 67% of the cases, squamous cell carcinoma in 21%, giant cells in 7% and atypical carcinoid tumour in 5%. The right upper lobe (RUL) was involved in 41% of the cases, right lower lobe (RLL) in 24%, left lower lobe (LLL) in 19%, left upper lobe (LUL) in 14% and middle lobe in 2%.
Lymph node surgical upstaging occurred in 11 (26%) patients, of which 8 were upstaged to N2 and 3 to N1. In the N2 group, single station upstaging occurred in half of the cases.
Lower lobes were affected in 64% of the upstaged patients. However, in only 5 (12% of the total) of the 11 patients, the upstaging was related to lymph node stations previously sampled by EBUS. The upstaged patients had tumours involving the RLL in 2 cases, the RUL in other 2 and the LLL in1. Of the 6 (14% of the total) in which upstaging took place in lymph nodes not sampled by EBUS, half of them concerned to station 5 and 9, not accessible by EBUS and the other half to station 12. Adenocarcinoma was the most frequent histological subtype in the upstaged group.

Conclusions
Although the total number of upstaged patients is substantial (26%), with predominance of the lower lobe tumours, we realize that only in 12% it was related to lymph node stations previously sampled by EBUS. Furthermore, the other 14% would not benefit from cervical mediastinoscopy due to the location of the involved lymph nodes (stations 5, 9 and 12). Both EUS or VATS might be helpful in these cases, but being N2 single station it might not change the indication for upfront surgery.

THORACIC SURGERY - SELECTED ORAL COMMUNICATIONS

LUNG RESECTION FOR NON-SMALL-CELL LUNG CANCER - A NEW RISK SCORE TO PREDICT MAJOR PERIOPERATIVE COMPLICATIONS

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Introduction
Lung cancer is the leading cause of cancer-related deaths worldwide. Surgery remains the best treatment for obtaining a cure in patients in resectable stages. Despite the improvements in surgical techniques, perioperative complications are still a major factor of mortality. Several scoring systems for quantifying surgical risks have been proposed but they require large and complex information, usually regarding specific groups or postoperative mortality.

Objectives
Identify risk factors for major in-hospital perioperative complications (MIPC) after anatomical lung resection for Non-Small-Cell Lung Cancer (NSCLC) establish a clinical scoring system.

Materials and Methods
Single center retrospective study of all consecutive patients diagnosed with NSCLC submitted to anatomical lung resection from 2015 to 2019 (N=564). Exclusion criteria: previous lung surgery (29), concomitant non-lung cancer related procedures (10), urgency surgery (5). The population of study was 520 patients. Primary end-point: MIPC defined as a composite endpoint including at least one of the following in-hospital variables – myocardial infarction, cardiac arrest, de novo Atrial Fibrillation, stroke, acute renal lesion, bleeding, acute pulmonary edema, primary respiratory failure, respiratory infection, empyema, sepsis, wound infection and need for reoperation.Univariable and Multivariable analyses were developed to identify predictors of perioperative complications and create a risk score. Discrimination was assessed using the C-statistic. Calibration was evaluated by Hosmer and Lemeshow test and internal validation was obtained by means of bootstrap replication.

Results
The study population had a mean age of 65 years and 327 (62.9%) were males. Mean hospital stay of 9 days after surgery. Overall MIPC rate was 23.3%.Among 26 clinical variables, male gender (OR 1.9; CI95%:1.16-3.07; p=0.010), hypertension (OR 2.1; CI95%:1.35-3.37; p=0,001), forced expiratory volume in 1s (FEV1) less than 75% (OR 2.5; CI95%:1.53-1.17; p<0.001), thoracotomy (OR 2.1; CI95%:1.20-3.57; p=0.009), bilobectomy/pneumectomy (OR 2.5; CI95%:1.2-4.9; p=0.011) and concomitant lung cancer procedures (OR 2.1; CI95%:1.20-3.58; p=0.009) were independent predictors of MIPC. A risk score based on the odds ratios was developed and ranged between 0 and 14 points. The scoring system was divided in 5 groups: 1-2 points (Positive predicted value (PPV) 15%); 3-4 (PPV 25%); 5-7 (PPV 35%); 8-9 (PPV 60%); >10 points (PPV 88%). The score showed reasonable discrimination (C-statistic=0.70), good calibration (P=.643) and it was internally validated (averaged C-statistic=0,71).

Conclusions
This study proposes a simple and daily-life risk score system that was able to predict the incidence of perioperative complications, in order to identify patients at a high risk and facilitate clinical decision-making related to treatment strategy selection.

SHORT ORAL COMMUNICATIONS

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

THERAPEUTIC STRATEGY FOR RESECTABLE STAGE IIIA/N2 NSCLC: A SINGLE CENTER EXPERIENCE

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Introduction
Patients with resectable IIIA/ N2 disease have poor outcomes after resection alone and the optimal treatment remains controversial, justifying multimodal individualized interventions.

Objectives
This study aimed to evaluate the clinical outcomes of this specific setting of patients treated in our institution.

Materials and Methods
We retrospectively analyzed the medical records of all patients with pathological N2 disease operated with curative intent, between January 2012 and June 2020. All patients in our cohort treated prior to 2017 were re-staged according to the 8th TNM edition.

Results
A total of 28 patients were enrolled, 15 were males, the median age was 68 years old (IQR 73-63) and 22 had a smoking history. Adenocarcinoma was the prevalent histology (n=21), with positive impact on survival (p=0.016). The majority of patients (n=20) had surgery up-front and adjuvant chemotherapy (SC); the remaining had surgery in combination with other treatment regimens (OT). The median follow-up time was 29 months (IQR 13.75 – 38). The median disease free survival (DFS) and overall survival (OS) were 14 (IQR 9.5 – 22) and 31.5 months (IQR 13.5-43.5), respectively. Three patients died of a non-related cause.Twenty-four patients had an anatomical lung resection (bi/lobectomy=22, pneumonectomy=2) and 16 had minimally invasive surgery. All patients had complete resection. The median length of hospital-stay was 5.5 days (IQR 3.75-10.25). There was no 30-day mortality, and no morbidity associated with pneumonectomy. No OS difference was identified between anatomical and non-anatomical resection (p=0.456). The SC group analysis (n=20) revealed a DFS and OS similar to the overall group (n=28), with more than 50% of the patients alive at 36 months and a 65% 2-years OS; we found no correlation between survival and the number of mediastinal lymph-nodes removed (p=0.206), and no OS difference between pathological single-station versus multi-station N2 (p=0.631); thirteen patients had recurrence, 10% in the lymph nodes, with a median OS not significantly different between the recurrence and the non-recurrence subgroup (p=0.749).

Conclusions
Our results in general overlap those of literature. A worse survival would be expected in patients with N2 multi-station and a superior morbidity associated with pneumonectomy; we nevertheless regard our results with caution as bias can be introduced by the small sample size. Efforts must continue to identify the best treatment strategy for the IIIA-N2 patients as the prognosis is still unsatisfactory.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

SURGICAL MANAGEMENT OF IATROGENIC POST-INTUBATION TRACHEAL RUPTURE: CASE REPORT

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Introduction
Iatrogenic tracheal rupture is a rare complication after intubation. It represents a life-threatening condition requiring prompt diagnosis, management, and treatment. The management of iatrogenic tracheal rupture is challenging, and treatment options depend on tear location, size, injury extent, and the patient's respiratory status.

Objectives
The authors report a case of a 39-year-old woman, with no medical history, who experienced an iatrogenic tracheal rupture during endotracheal intubation with a double lumen tube for a bilateral thoracic sympaticectomy under general anaesthesia.

Materials and Methods
When performing fibroscopy for confirmation of the tube's positioning, a discontinuity at the level of the posterior tracheal wall – with an extension of about 4-5 cm - beginning at the middle 1/3 and extending to about 1.5 cm from the carina was verified. She then was submitted to a CT scan where an area of interruption of the posterior wall of the upper/middle third of the trachea, superior to the carina, discretely lateralized to the right, with a maximum circumferential orifice of 1cm and with an extension of about 5.5 cm was observed. It was associated with a medium/large volume pneumomediastinum that extended to the anterior aspect of the covered abdominal plans.

Results
The patient was transferred to our hospital still intubated for urgent surgical treatment. She was successfully submitted to correction of the tracheal laceration through a transversal 4cm cervicotomy and a longitudinal anterior extended tracheotomy. After surgery, she was extubated early in the operative room and discharged after a 5-day course of broad-spectrum antibiotic prophylaxis with imipenem. She was observed 1 month after discharge without complaints or complications. She was submitted to a new bronchoscopy showing preserved tracheal caliber, with good cicatrization of the sutures of the anterior and posterior walls, without granulation or evidence of dehiscence.

Conclusions
We managed this case surgically because the patient had a large tear > 2 cm, with rapid establishment of a medium/large volume pneumomediastinum. Immediate recognition and adequate treatment are very important in managing this potentially fatal situation. The final decision should be based on clinical, radiologic and bronchoscopic findings.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

RESULTS OF SURGERY OF CHRONIC PULMONARY ASPERGILLOSIS – OUR CENTRE'S EXPERIENCE

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Introduction
Aspergilloses refers to a spectrum of disease caused by *Aspergillus species* that includes simple aspergiloma, chronic cavitary pulmonary aspergillosis (CCPA) and subacute invasive aspergillosis (SAIA) (1;3).
Surgical results of CCPA or SAIA are worse when compared with those for simple aspergilloma, and the surgical indications remain somewhat unclear. These patients can be challenging due to ongoing inflammatory process and the risk for postoperative complication. (1,2;3).

Objectives
We retrospectively reviewed our surgical results between August 2010 and August 2020.

Results
Twenty-five patients underwent surgery for pulmonary aspergillosis at Department of Cardiothoracic Surgery of University Hospital Center of São João: 12 patients (48.0%) with aspergilloma, 10 (40.0%) with chronic cavitary pulmonary aspergillosis and 3 (12.0%) with sub-acute invasive aspergillosis. We excluded the pediatric patients.
Seventeen patients were males with a median age of 48 years-old (range 19-69). Five patients had COPD, 7 patients were immunocompromised, 10 patients had bronchiectasis on CT scan and 12 patients had a previous history of tuberculosis. *Hemoptysis* was the most frequently symptom (44%) and was the main reason of refer for surgery.
Nineteen patients were submitted to lobectomy (76%), 5 patients were submitted to wedge resections (20%) and one patient was submitted to a left pneumectomy (4%). More than half of the patients (52% n=13) had mainly the left superior lobe affected by aspergillosis follow by superior right lobe and inferior left lobe (24% each).
Median time at hospital was 8 days (4-98) and medium time of drainage was 7 days (1-47). *Prolonged pulmonary air leak was the most frequently (20% of patients) complication follow by non-nosocomial respiratory infection (12%), chronic pain (8%) and hemothorax (4%). At the end of the follow-up 23 patients were alive (92%)*.
Results were considered statistically significant if $p < 0,05$. In our study there was no statistically significant differences in hospital length of stay, length of drainage and rate of complications according to subtype of aspergilloses (aspergiloma; CCPA and SAIA).

Conclusions
There were no relapses of aspergillosis on the first year after surgery on patients who kept outpatient following.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

SURGICAL RESECTION OF SMALL-CELL LUNG CANCER: TWENTY YEARS OF EXPERIENCE AT UNIVERSITY HOSPITAL CENTER OF SÃO JOÃO

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Introduction

Small-cell lung cancer (SCLC) includes approximately 15% of all newly diagnosed lung cancers worldwide and is distinguished by its rapid growth rate and early dissemination. Despite advances in the treatment the 5-yearsurvival rate remains low. The National Comprehensive Cancer Network Guidelines (3) reported less than 5% of the patients with SCLC are diagnosed in stage I-IIA. This is the group of patients most likely to benefit from surgery. Lobectomy with mediastinal lymph node dissection is the preferred operation and patients who undergo complete resection should be treated with postoperative systemic therapy. Surgical resection is associated with longer survival and approaches 40% to 50% at 5 years with adjuvant chemotherapy (2). Surgical resection of presumed early SCLC may also be beneficial so as not to miss a mistakenly diagnosed SCLC which may indeed be a NSCLC or mixed neuroendocrine tumor.

Objectives

We retrospectively reviewed our surgical results between August 2000 to August 2020.

Results

Eight patients with SCLC were submitted to thoracic surgery (5 lobectomies, 1 pneumectomy and 2 wedge resection). The surgical biopsies were excluded. Six patients were males with a median age of 62 years-old (range 50-79) and 50% had an history of emphysema or COPD. Four patients were active smoker, one was a former smoker and one was a non-smoker (none information was available for the remaining 2 patients). Most of diagnoses was obtained by a transbronchial lung biopsy. The median post-operative length of drainage was 4 (range 1-43) days, and median post-operative length of stay was 6 (range 5-44) days. We reported 3 complications (1 case of non-nosocomial respiratory infection and 2 cases of prolonged pulmonary air leak). All the patients had a complete R0 resection. Only 3 patients had exclusive SCLC in pathological findings (the other 5 were associated with NSCLC). Postoperative staging between I-IIA were find in 62.5% (n=5). All the patients were submitted to adjuvant chemotherapy One patient was submitted to cerebral radiotherapy after the diagnosis of cerebral metastasis.

Conclusions

The only two patients alive in the present time were submitted to thoracic surgery in June of 2017 and December of 2019. Five of the seven (71%) patients were alive after 1 year of surgery but only one of six (17%) were alive after 5 years of surgery, according to completion of the follow-up. The medium time between date of death and the date of diagnosis was 699 days (range 360-2724 days), less than 2 years.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

JUAN ROSAI MEMORY – THYMOMAS CLASSIFICATION

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Introduction

Thymomas classification dates from 1976 Juan Rosai/Gerald Levine established the epithelial nature of the "thymoma" and correlated morphology and biological behaviour with the degree of thymus capsule invasion at surgery. Surgical staging was fundamental for the subsequent classification of Masaoka *et al* in 1981, still commonly used in routine.
Müller-Hermelink Histogenetic Classification (1999) supported WHO 2004/2014 classification, allowing the actual naming Thymomas in A and/or B typing.
Overall survival for types AB and B1 Thymomas is very good – 80-100% at 5 and 10 years and for type B2, 70-90% at 10 years has seen recognized.

Objectives

Juan Rosai (August 20, 1940 – July 7, 2020) legate calls attention for the actual 2014 WHO thymomas classification. A broad morphology recognition is demanded instead of a single cut apart language – case report of a Thymoma AB, with B1 and B2 components.

Materials and Methods

Solid 11,3x7cm antero-superior mediastinum mass detected at CT was proposed for surgical removal in a 65-years old woman hospitalized suspecting of Rickettsial infection.

Results

Surgical specimen weighing 329g and measuring 12x9x7cm, delimited by thymus thin and shiny capsule showed tumoural cut surface, vaguely lobulated, tan to pink and smooth.
Microscopic evaluation detected two intermingled different components: a clear nodular pattern with bland spindle cells bundles – thymoma A, interspersed with B pattern where quantity variable population epithelial superimposing T cells (CD3+) defined patterns of thymomas type B1 and type B2.

Conclusions

Thymomas are a rare malignancy in general, but the most common mediastinal tumours in adults over fourties, with type AB as the most common, between 11 and 89 years old followed by type B2 and B1.
Type AB thymoma encompasses poverty of lymphocytes over spindle cells (type A) besides other epithelial component rich in T lymphocytes (type B).
In the present a case it was possible to subtype B component thymoma in either B1 and B2 by applying 2014 WHO recommendations. Taking into account Type B2 thymoma poorer outcome compared to Type AB and Type B1 thymomas, it is important to differentiate and subtype B component when present, to preview of possible therapeutic strategies in follow up.
No etiologic factor has been still attributable for the appearance of this kind of neoplasia, but there are some reports and putative thymic epithelial cells precursors.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

POSTOPERATIVE ATRIAL FIBRILLATION - VIDEO-ASSISTED THORACOSCOPIC SURGERY VERSUS OPEN SURGERY

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Introduction
Postoperative atrial fibrillation (PAF) is one of the most common complications after noncardiac thoracic surgery, increasing postoperative mortality, morbidity and hospital stay. However, the etiology of PAF still remains unclear. It is proved video-assisted thoracoscopic surgery (VATS) has significantly less morbidity and a shorter hospital stay than open procedures. Nevertheless, there is no agreement if VATS is related to incidence of PAF, with some data suggesting this procedure, by obviating surgical stress induced by ribspreading thoracotomy, may result in a decreased rate of PAF.

Objectives
Compare the incidence of PAF after anatomical lung resection for Non-Small-Cell Lung Cancer (NSCLC) following open surgery versus VATS.

Materials and Methods
Single center retrospective study of all consecutive patients diagnosed with NSCLC submitted to anatomical lung resection from 2015 to 2019 (N=564). Exclusion criteria: prior atrial fibrillation (26), previous lung surgery (29), concomitant procedures (10), pneumectomy (14), extra-lung resections (41), urgency surgery (5). The population of study was 439 patients. Primary end-point: PAF, defined by in-hospital electrocardiographically documented atrial fibrillation requiring initiation of pharmacological therapy. The patients were divided in 2 groups according to type of procedure: thoracotomy or VATS. Patients converted from VATS for whatever reason were assigned to thoracotomy group. Univariable analysis was used to compare the baseline characteristics of the 2 groups. We use inverse probability of treatment weighting (IPTW) multivariable logistic regression model to obtain unbiased estimates of average procedure effect on PAF. A total of 22 clinical variables were included in the model. The balance between treatment groups after IPTW was assessed by standardized mean differences.

Results
Two hundred and eighty patients (63.8%) were submitted to thoracotomy and 159 (36.2%) to VATS. Patients submitted to VATS were more likely to be females (p=0.004), had a lower prevalence of Diabetes Mellitus (p=0.028), previous respiratory disease (p=0,042), non-adenocarcinoma (p<0.001) and chronic heart failure (p=0.026). They were submitted less often to neoadjuvant therapy (p<0.001), bilobectomy (p=0.001) and they presented higher levels of diffusing capacity for carbon monoxide (p=0.001). After IPTW adjustment, all clinical covariates were well balanced. PAF occurred in 8.6% of the patients undergoing thoracotomy and 3,8% of the patients after VATS. After IPTW adjustment, VATS was not associated with a lower incidence of PAF (OR 0.40; CI95%:0.140-1.171; p=0.095).

Conclusions
In this study, minimally invasive non–rib spreading VATS did not decrease the incidence of PAF when compared with standard thoracotomy regarding anatomical lung resection for NSCLC.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

RECURRENT PLEURAL EFFUSION - AN UNUSUAL DIAGNOSIS IN A YOUNG MALE

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Introduction
Malignant pleural mesothelioma (MPM) is a rare cancer, with poor outcome. Often associated with asbestos exposure, recent data reported a genetic predisposition in some patients. The optimal treatment is still under debate and investigation.

Materials and Methods
We report a case of a young adult diagnosed with recurrent pleural effusion and no history of asbestos exposure.

Results
Case presentation: A 33 years-old male, non-smoker, account manager, without relevant medical history or current medication. With no occupational asbestos exposure.
In 2016, the patient first presented with left pleuritic pain and pleural effusion on chest x-ray, but without evidence of infection.
After 2 years, the left pleural effusion recurred, without further findings on chest CT. A diagnostic thoracentesis was performed and fluid analysis was negative for both cytologic and cultural tests. Autoimmune disease was ruled out. There was resolution of the pleural effusion without repeated thoracentesis or drainage.
In 2019, he was admitted to the emergency department with recurrent pleuritic pain and left pleural effusion, with de novo left costophrenic pleural thickening on CT-Scan. FDG PET-Scan showed increased uptake on the pleura located in the left costophrenic angle and in the fissure (SUV 2-5), without other lesions. A pleural biopsy was performed, by video-assisted thoracoscopic surgery, and pathologic analysis revealed epithelioid MPM. Genetic study detected function loss of BRCA1-associated protein (BAP-1).
After multidisciplinary discussion, the patient was proposed for surgery in our department. The patient underwent radical left pleurectomy/decortication without any intraoperative complication. He was admitted at our ICU for immediate care and was extubated at first postoperative (PO) day. There were no postoperative complications, chest tube was removed on the tenth PO day and he was discharged home the day after. Pathologic analysis confirmed epithelioid MPM, disease stage II (pT2N0M0). Adjuvant treatment with cisplatin plus pemetrexed was performed and well tolerated, as well as pulmonary rehabilitation. Follow-up after 5 months, the patient was asymptomatic and without recurrence.

Conclusions
Germline mutations of BAP1 predispose to several different tumors including malignant mesothelioma. The diagnosis of MPM can be delayed by non-specific symptoms. The role of surgery (pleurectomy/decortication or extrapleural pneumonectomy) in MPM is critically discussed. Macroscopic complete resection, an R1 resection, is the objective of surgery for MPM. In selected patients, surgery should be performed in experienced centers.

THORACIC SURGERY - SHORT ORAL COMMUNICATIONS

SOLITARY FIBROUS TUMORS OF THE PLEURA – 20-YEAR EXPERIENCE

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Introduction
Solitary fibrous tumors of the pleura (SFTP) are rare, slowly growing pleural neoplasms. Patients are usually diagnosed in their 5th to 8th decade, without associated symptoms. The best treatment consists of margin free surgical resection (R0).

Objectives
We analysed our center's surgical experience with SFTP, describing the demographic and individual patient/tumor characteristics, the surgical options and results over a period of 20 years.

Materials and Methods
The Department's database was searched for SFTP between January 2000 and July 2020, resulting in total of 58 cases. 51 patients were included in the final analysis.

Results
31 were women (61%) and 20 men (39%). Most (88%) were diagnosed over age 50, the average age being 60.2 years (range 30 – 78). Symptoms were present in 43% of the patients (22 cases), most commonly coughing, dyspnea or unspecific symptoms (weight loss, tiredness, anorexia). Thoracalgia was present in 17.6% (9) and 7.8% (4) had finger clubbing and polyarthralgia. Doege-Potter syndrome was found in one case (1.9%) and completely resolved after surgery.

The largest tumor diameter was 22 cm and the smallest one 2 cm, with an average size of 6,62 cm. Videothoracoscopy was performed in 35% (18 cases) and thoracotomy in the remaining 33 (65%). R0 ressection rate was 90.2%. Lung resection, along with the mass, was performed whenever the origin was the visceral pleura, to insure a safe margin: wedge resection in 49% (25 cases), lobectomy in 5.9% (3 cases) and bilobectomy and pneumonectomy each in 1.9% (one case). Other structural en-bloc resections were also necessary at times: ribs in one case (1.9%) and diaphragm in 2 (3.9%). Predictors of recurrency were present in 30 patients: pleural effusion (1 case, 1.9%), atypical localization (41.2%; 21 cases), histological criteria for malignancy (7 cases,13.7%) and border-line in 1 (1.9%). There were 4 recurrences (7.8%). 3 out of these 4 patients had an atypical localization of the tumor defined as parietal or costal/cisural pleura. In all cases the resection was deemed complete, none had histological criteria for malignancy, but necrosis was present in 3 cases and atypia in the other 2. Disease free survival was 49 months (range 13 – 105).

Conclusions
Solitary fibrous tumors of the pleura are characterized by uncertain behavior. They often present as large assymptomatic masses. *En bloc* complete resection is the most important prognostic factor. Relapse can occur more than a decade after the initial diagnosis.

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VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

THE DIAGNOSTIC ACCURACY OF NEAR-INFRARED SPECTROSCOPY IN CAROTID ARTERY ENDARTERECTOMY UNDER REGIONAL ANESTHESIA – SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction
Methods for monitoring cerebral perfusion during carotid endarterectomy (CEA) include near infra-red spectroscopy (NIRS). The accuracy of this method for detecting critical brain ischemia is variable among the literature, possibly owing to the heterogeneity in procedural methods, patient characteristics and diagnostic cut-off values utilized.

Objectives
The aim of this study was to assess the utility of monitoring the brain with cerebral NIRS during CEA. A systematic review and meta-analysis on the diagnostic accuracy of NIRS for detecting critical brain ischemia in patients undergoing CEA under regional anesthesia was performed.

Materials and Methods
The electronic databases MEDLINE, Scopus and Web of Science were searched, up to 1 August 2020, utilizing an appropriate query. Original studies involving patients undergoing CEA under regional anesthesia were included. Eligible studies included those in which NIRS was compared with awake neurological assessment (reference test). Only studies that provided a relative post-clamping NIRS decrease cutoff for diagnosis of cerebral ischemia were included. By performing bivariate meta-analysis, areas under the summary curve (AUC-sROC), and summary sensitivities, specificities, likelihood ratios and diagnostic odds ratios were calculated.

Results
After selection, 9 studies were included, with a total of 1076 patients and 1063 CEAs under regional anesthesia. All 9 studies were included in the meta-analysis assessing the diagnosis accuracy of NIRS for intra-operative brain ischemia. The obtained partial AUC-sROC was of 0.625 (Figure 1), with a summary sensitivity of 73.1% (95%CI=55.6-85.5%) and a specificity of 96.8% (95%CI=76.6-87.9%) (Table 1). There was no considerable threshold effect observed (r=0.322). Heterogeneity was found to be substantial (I2=63.1%). Statistical heterogeneity was further investigated through metaregression. Multiple predefined covariates contributed to inter-study heterogeneity; however, only prevalence of hypertension (p=0.004), history of coronary artery disease (p=0.0282) and symptomatic carotid stenosis (p=0.0359) were significant effect modifiers. Proportion meta-analysis was performed for studies which reported 30-day stroke rate (n=4) with a summary sensitivity of 39% (95%CI=16.9-66.8%; I^2=0) and specificity of 80.7% (95%CI=72.4-87.0%%; I2=70.9%) for detection of periprocedural stroke.

Conclusions
The results of this study suggest that NIRS cerebral monitoring is not a reliable method to detect cerebral hypoperfusion in this type of surgery. The optimal cu-toff that could potentiate the use of shunting could not be defined. NIRS is not a consistent method in predicting perioperative stroke.

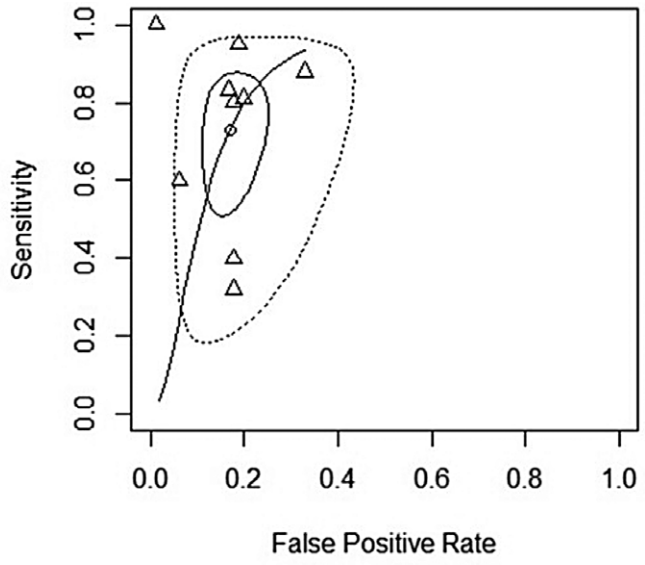

Figure 1: summary receiver operator curve (sROC) for NIRS.

Ø: summary point; Δ: primary study estimate; :sROC curve; :95% confidence region; :95% prediction region

Table 1 **NIRS cerebral oximetry test evaluation**

	AUC - ROC	Partial AUC-sROC	Sensitivity (%) CI [5-95%]	Specificity (%) CI [5-95%]	LR +	LR -	Diagnostic Odds ratio	r
Cut-off 15%	0.86	0.625	73.1% (95%CI=55.6-85.5%)	83.0% (95%CI=76.6-87.9%)	4.3 (95%CI=3.0-6.1)	0.3 (95%CI=0.2-0.5)	14.4 (95%CI=6.0-29.3)	0,322

AUC – ROC: Area under the curve of the receiver operating characteristic; CI – confidence interval; LR – likelihood ratio; ND – Neurologic deficits; Diagnostic Odds ratio: NIRS -fall - percentual drop in forehead near-infrared spectroscopy cerebral oximetry oxygen saturation; Partial AUC-sROC – partial area under the curve for sensitivity receiver operating charateristic; r – correlation coefficient.
I2 = 63.10%

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

THE INFLUENCE OF HEMODYNAMIC CHANGES ON NEUROLOGICAL STATUS DURING CAROTID ENDARTERECTOMY UNDER REGIONAL ANESTHESIA

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Introduction

Hemodynamic changes during carotid endarterectomy (CEA) has been associated with periprocedural stroke. Both periprocedural hypertension and hypotension increase the risk of periprocedural stroke. Large drops in intraoperative blood pressure are also associated with the presence brain ischemic lesions. The association between the periprocedural hemodynamic status and the onset of post-clamping signs of critical brain ischemia has not yet been described.

Objectives

The aim of this study is to determine the effect of the perioperative hemodynamic status on the onset of post-clamping neurological deficits in patients undergoing CEA under regional anesthesia (RA).

Materials and Methods

A case-control study from a prospectively maintained database was performed. All patients underwent CEA under RA, with awake neurological testing to detect critical cerebral ischemia in a tertiary and referral center. Eighty-five patients who presented post-clamping neurological deficits (cases) were compared with 77 consecutively selected patients without post-clamping signs of brain ischemia (controls). Blood pressure values were registered before clamping and 1, 3 and 10 minutes after clamping.

Results

Compared with controls, patients with a positive awake test were older (mean ± standard deviation: 71.9 ± 9.37 vs 68.3 ± 8.34, p=0.01) and had higher prevalence of obesity (23.8% vs 9.3%, p=0.015). Compared with controls, patients with a positive awake test had a less significant post-clamping drop in blood pressure 1 minute (12.04±16.65mmHg vs 19.79±24.01mmHg, p=0.02) and 3 minutes (11.02±21.43mmHg vs 19.42±26.78mmHg, p= 0.03) after clamping.

Table 1 Demographics and comorbidities of the patients

	Control N (%) 77 (50)	ND N (%) 85 (50)	P-Value
Age (years) (mean ± SD)	68.3 ± 8.34	71.9 ± 9.37	0.01
Side (Right)	41 (53.9)	39 (47)	0.381
Sex (Male)	63 (81.8)	66 (77.6)	0.510
Hypertension	67 (87)	80 (94.1)	0.119
Smoking history	44 (58.7)	38 (45.2)	0.091
Diabetes	30 (40)	35 (41.7)	0.831
Dyslipidemia	64 (85.3)	70 (83.3)	0.729
CKD	8 (10.7)	10 (11.9)	0.806
BMI > 30 kg /m^2	7 (9.3)	20 (23.8)	0.015
PAD	19 (25.3)	18 (21.4)	0.561
CAD	25 (33.3)	31 (36.9)	0.638
AF	4 (2.5)	6 (7.1)	0.639
COPD	10 (13.3)	8 (9.5)	0.449
CHF	6 (8)	10 (11.9)	0.414

Legend: CAD – Coronary artery disease; CHF – Cardiac heart failure; CKD: Chronic kidney disease (creatinine = 1.5 mg/dl); COPD – Chronic obstructive pulmonary disease; ND: Alterations on the neurologic examination during carotid clamping; PAD – Peripheral artery disease; Obesity: Body Mass Index >30kg/m2; SD– Standard Deviation; AF – atrial fibrillation

Table 2 **Post-clamping hemodynamic changes**

Positive awake test	Control n=77	Awake test + n=85	
Δ Preclamp Pos 1 min	19.79±24.01	12.04±16.65	0.019
Δ Preclamp Pos 3 min	19.42±26.78	11.02±21.43	0.032
Δ Preclamp Pos 10 min	21.55±31.97	15.73±30.53	0.245
Δ Preclamp Pos max	36.00±31.21	30.18±27.53	0.227

Legend: Δ Preclamp Pos 1 min (3 min; 10 min): Drop in blood pressure 1 minute (or 3 minutes; 10 minutes) after clamping; Δ Preclamp Pos max: maximum registered drop in blood pressure

Conclusions

Larger decreases in post-clamping blood pressure are not associated with onset of neurological deficits. Although patients with a positive awake test have higher initial post--clamping blood pressure, the hemodynamic profile does not differ from that of controls.

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

BURDEN OF GROIN WOUND COMPLICATIONS AFTER VASCULAR SURGERY INVOLVING THE FEMORAL VESSELS

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Introduction
Wound complications following vascular surgery procedures are associated with important morbidity and cost. Economic burden and risk factors associated with inguinal wounds have not been previously described.

Objectives
We aimed to evaluate the incidence, severity and healthcare costs of inguinal surgical wound complications, including surgical site infections, dehiscence, lymphorrhagia/seroma and haematoma.

Materials and Methods
We retrospectively identified all patients with inguinal incisions for surgical femoral vessels approach in our institution from 2017 and 2018. Surgical reinterventions in patients with active wound infection were excluded. All additional costs related to surgical groin wound complications were calculated. Risk factors associated with groin wound complications were also identified. Multiple regression and T-tests were used for statistical analysis.

Results
524 incisions were identified in 415 patients, 77,3% were male and median age was 81.5 years-old (range 15-102). 15,5% had prior ipsilateral groin incision. There was a 12,8% wound complication rate (n=67): 40,3% (n=27) had wound infection (63% superficial and 37% deep incisional infections), 17,9% had dehiscence without infection, 26,9% had lymphorrhagia/seroma without infection and 25,4% haematoma without infection. 3,4% of all patients (n=18) were readmitted due to wound complications and 3,8% (n=20) had longer hospitalization time (median 8,4±13,0), with a total 563 extra hospitalization days and cost 126.283,92€. Median extension of hospitalization time was 11,6 days (range 2-40). 2,8% (n=15) had additional operative interventions (range 1-4 surgeries), total cost 13.474€. 22 patients went to emergency department due to wound complication (estimated cost 3.822€) and 26 patients had additional consultations (total cost 855,36€). An additional 35.040€ were estimated for dressing care in primary health system and 9.306,6€ for ambulance transport. Only 4 patients had vacuum therapy (cost 4.623,13€).
Overall, extra 193.402€ were spent in groin wound complications in patients with vascular surgery involving the femoral vessels in 2017 and 2018 (2.886,6€/patient±3.828,9€). 64,3% of total cost was spent in additional hospitalization days. Patients with infection had higher readmission and reoperation rates (51,9% *versus* 6,3-11,8% and 40,7% *versus* 0-17,6% in dehiscence/seroma/haematoma, respectively). On the other hand, patients with seroma had longer hospitalization time (50,0% versus 17,6-33,3%). Diabetes (OR1.7, p=.04), >10cm incision (OR2.79, p=.01), urgent surgery (OR1.9, p=.016) and reoperation (OR1.89, p=.042) were associated with higher surgical wound complications and transverse incision (OR0.43, p=.015) was a protective factor.

Conclusions
Groin wound complications have high additional charges. Good glycemic control, smaller and transversal incisions and non-urgent surgeries should be pursued in order to decrease wound complications and economic burden.

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

PROGNOSTIC VALUE OF CHARLSON COMORBIDITY INDEX IN ACUTE EMBOLIC LOWER LIMB ISCHAEMIA PATIENTS

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Introduction
The Charlson Comorbidity Index (CCI) is commonly used in outcome studies to adjust for patient comorbid conditions, but has not been specifically validated for use in acute embolic lower limb ischaemia (AELLI).

Objectives
The aim of this study was to access whether a high CCI score unadjusted (CCIu) and adjusted (CCIa) by age relates to major amputation and mortality after a first episode requiring surgery for AELLI.

Materials and Methods
The last 100 patients presenting with the first event of AELLI submitted to embolectomy in our Vascular Surgery Department were retrospectively evaluated. Patient characteristics, pre- and post-operative period variables were collected and CCIu and CCIa preoperatively calculated. Predictors of survival were analysed using Cox regression first in univariable analysis and then testing the proportional hazards in a multivariable model. We calculate the area under the curve (AUC) of the receiver operating characteristic (ROC) curves to validate and determine the discriminating ability of CCIu and CCIa in predicting amputation rate and 30-day mortality. Youden index was used to determine the critical value. Survival analysis were performed with the Kaplan-Meier method and differences between survival curves were tested with the Log-Rank test. A p value of $< .05$ was considered statistically significant.

Results
The mean age was 80.03±10.776 years and the mean follow-up 19.28±7.929 months. Amputation rate was 16%, 30-day mortality 21% and long-term mortality 42%. Univariate analysis revealed that patients with lower hemoglobin level had higher global mortality. Also, patients with higher creatinine levels had both higher 30-day and global mortality and patients with higher C-reactive protein levels had both higher amputation rate and 30-day mortality. Patients with CCIu >3 compared with patients with CCIu ≤ 2 had higher amputation rate (37.5% vs. 1.7%; OR:26.238), 30-day mortality (47.5% vs. 3.3%; OR:35.400) and global mortality ($p=.00$). Also, patients with CCIa > 6 compared with patients with CCIa ≤ 6 had higher amputation rate (34.1% vs. 1.8%; OR:28.488), 30-day mortality (47.7% vs. 0.0%; OR:33.382) and global mortality ($p=.00$). Multivariate analysis showed that both CCIu and CCIa scores were independent predictors of amputation rate and 30-day mortality.

Conclusions
In our study both CCIu and CCIa has proven to be a good predictor of amputation rate and survival.

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

IS DOUBLE ANTIPLATELET THERAPY PROTECTIVE WHILE WAITING FOR CEA IN SYMPOTMATIC PATIENTS?

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Introduction

Carotid endarterectomy confers maximum benefit if performed in the first 14 days after an acute, non-cardioembolic ischemic stroke/transient ischemic attack (TIA).

Nevertheless, there is considerable interest in whether there is a role for starting double antiplatelet (DAPT) therapy in the very early time period after symptom onset.

Materials and Methods

The authors conducted an observational retrospective analysis of all consecutive patients submitted to carotid endarterectomy (CEA) between 2010 and 2020 due to carotid artery symptomatic stenosis.

Patients were allocated to Group I (acetylsalicylic acid alone), II (clopidogrel alone) or III (DAPT) considering the anti-platelet treatment they received during the period between the index event and CEA.

Outcomes were recurrent TIA or stroke during the pre-operative period.

Results

We analysed 104 patient, 78 males, with a mean age of 70 years old. In Group I, we had 72 patients with 9 (13%) recurrent events. Group II had 14 patients with 1 (7%) recurrent event. Group III had 18 patients with no (0%) recurrent events. There was a significant (34%) RRR in recurrent TIA/stroke events in patients receiving early DAPT, versus aspirin alone (0% vs. 13%, $p < 0.01$) and a (12%) RRR versus clopidogrel alone (0% vs. 7%, $p < 0.001$).

Conclusions

The authors believe that aspirin plus clopidogrel might be more effective than either alone in AIT/stroke recurrence prevention in concordance with most significant publications from four RCT (Payen, CARESS, CLAIR and AMBDAP).

DAPT may prevent spontaneous micro embolic signals, which are recognized marker of an increased risk of recurrent stroke in symptomatic patients.

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

VASCULAR ACCESS CONSTRUCTION FOR DIALYSIS IN PEOPLE LIVING WITH HIV

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Introduction
People living with HIV/ AIDS (PLWHA) owing to therapeutic developments achieved in the recent past average life expectancy similar to general population. Nonetheless, are susceptible to an additional risk for terminal chronic kidney disease, namely due to HIV nephropathy and/ or vasculopathy. The need of vascular access creation for dialysis, on PLWHA is frequent, and literature reporting outcomes after vascular access construction in this population is scarce and conflicting.

Objectives
The aim of this study was to evaluate outcomes after vascular access construction in PLWHA.

Materials and Methods
A retrospective review through a tertiary university hospital's database was performed resorting to ICD 9 codification, identifying all PLWHA which had any interaction with the Angiology and Vascular Surgery Department due to vascular access for dialysis between April 2006 and December 2019. Twenty-seven patients were identified among which, 21 had a vascular access construction in the hospital and were included. In those with more than one vascular access for dialysis construction in the hospital, the first intervention was considered as the index event. The consecutive first vascular access for dialysis construction in the hospital for a patient with no HIV infection was included as the control group in a 1:1 ratio. Comorbidities were collected at the time of index event.

Results
The study had a median follow-up of 68 months (95% confidence interval 62.485-73.515). Mean age of PLWHA was 52.4 ± 14.60 years while for control group was 60.7 ± 19.19 years (P=0.121), regarding sex 66.7% were male vs 52.4% (P=0.346), respectively. The significant differences in baseline demographics included viral hepatitis (P=0.007) and drugs of abuse history (P=0.017), both more prevalent in the study group. Neither the type of procedure for the vascular access construction (including arterial and venous anastomosis) or their outcomes, such as failure to mature, time to reintervention or thrombosis revealed to be statistically different. Nonetheless, at 12 months follow-up, the control group revealed a trend towards a higher thrombosis rate with 78.9 ± 9.4% vascular access patency in the PLWHA group vs 54.2 ± 12.0% in the control group (P=0.056). Long-term major cardiovascular adverse events or mortality were also not statistically different (logrank=0.137 and =0.173, respectively).

Conclusions
This single center, retrospective, case-control study of PLWHA submitted to vascular access construction for dialysis showed similar procedure and long-term outcomes compared to a control group. However, due the small study sample further studies are warranted to clarify these results.

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

IMPACT OF OPEN AND ENDO CASELOAD IN LOWER LIMB AMPUTATION: A NATIONWIDE ANALYSIS FROM 2000 TO 2015

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Introduction
Effective revascularization is the cornerstone of limb salvage in chronic limb threatening ischemia (CLTI). In recent years, elegant and less invasive endovascular revascularization techniques have supplanted surgical bypass as the primary mode of revascularization. The real impact of this transition is being increasingly questioned.

Objectives
This study aims to evaluate the endovascular evolution, and how it impacted the amputation rates nation-wide since de beginning of the century.

Materials and Methods
Every patient registered with limb revascularization and/or limb amputation between 2000 and 2015 due to peripheral arterial disease in Portuguese public hospitals were evaluated. The information was obtained through the Central National Healthcare Administrative database, a mandatory registry for hospital refunding. Year to year evolution in amputation rates and type of revascularization were the primary aspects of evaluation.

Results
Overall, there were 27291 episodes of patients submitted to revascularization (53.74% open and 46.26% endovascular) and 37117 to limb amputation (64.71% major vs 35.29% minor). 69.1% of the episodes were in man, and 70.9% had less than 80 years. The mean Charlon Index was 1.43. The global number of revascularization episodes consistently increased along the 15 analysed years.
The percentage of endovascular revascularizations varied from 12.71% in 2000 to 62.76% in 2015, and open surgery decreasing from 87.29% in 2000 to 37.24% in 2015. The percentage of major limb amputations decreased (73.76% in 2000 to 56.64% in 2015), opposingly to minor amputations that increased (26.24% in 2000 to 43.36% in 2015).
Along 15 years, hospital mortality, associated to revascularization episodes, decreased 3.0% (IC 2.909-3.126).

Conclusions
There was a significative increase in revascularization episodes along 15 years, that could mean a best access to health services and/or better diagnosis accuracy. Endovascular procedures were the most practiced. This was along with an increase in the minor limb amputation ratio, a decrease in major amputations ratio and a decrease in the hospital mortality. This nation-wide study adds to the increasing body of knowledge in the ever-pertinent discussion of revascularization types and benefits.

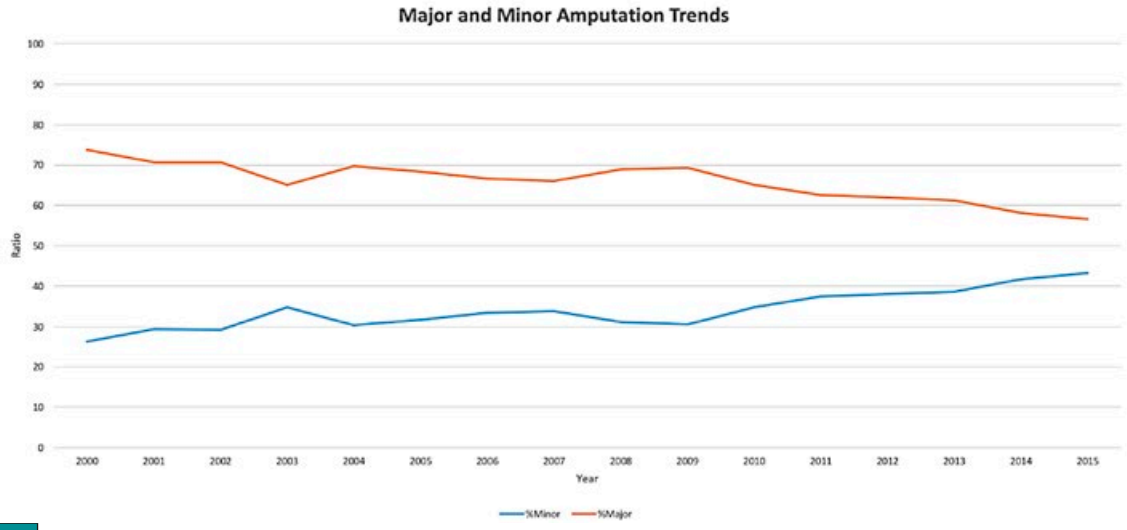

Figure 1 *Major and Minor amputations trends, from 2000 to 2015, in Portuguese public hospitals.*

VASCULAR SURGERY - SELECTED ORAL COMMUNICATIONS

IMPACT OF COVID-19 ON VASCULAR EDUCATION

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Introduction
The new SARS-CoV-2 (COVID-19) is been spreading fast and fiercely across the world from China since December 2019, causing massive lockdowns and pushing health services to their limits with new challenges. Vascular surgery departments are no exception and Vascular societies across the world issued some guidance through these turbulent times, resulting all together in surgery reduction and surgeons' reallocations.

Objectives
As expected, this impacts vascular trainees and their training and so, the aim of this study was to evaluate the impact o COVID-19 pandemic on vascular education.

Materials and Methods
A remote digital survey was spread across European networks aiming vascular residents and their activities during the first COVID-19 pandemic wave. Questions were related to possible trainee relocations, COVID-19 infections, daily activities reduction, scientific activity, exams and internships. Results reported here are from 7th July to 20th September. Duplicate responses were removed.

Results
A total of 104 answers across 27 countries were included. The mean age of the trainee's responders were 31.2 ± 3.58 years old, 63% were male and the residency year mode was the 5th. Forty-four (42.3%) of the trainees stood in the COVID-19 frontline, of which were mainly for COVID-19 wards (50%) and emergency departments (22.1%), with only two (1.9%) being relocated to a different hospital. Concerning time in the frontline, the most frequent answers were up to two weeks in 34.8% and above 12 weeks in 28.8%. More than half (76.9%) said to had suffer a decrease in number of surgical procedures performed and/or assisted with over 60% reporting a decrease superior to 50%. Annual or final exams were re-schedule or cancelled for 16.3% and 10.6% of the participants, respectively.
Of the responders, 56.7% as stated to have operated COVID-19 positive patients at the time of the survey. Six responders (5.8%) had said to have themselves being infected by COVID-19 while 63.5% answer to have had medical staff infected in their vascular departments.
Accordingly, to the survey, 73.5% claims that the first COVID-19 pandemic wave had a negative impact on vascular education and 73.4% agrees for the need of "some compensation" on their vascular residency curriculum.

Conclusions
The first COVID-19 pandemic wave brough a significant negative impact on vascular education with more than 50% of the responders suggesting a need for compensation after this period. However, as a second wave is emerging, this negative impact is expected to increase even more significantly.

SHORT ORAL COMMUNICATIONS

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

ILIOCAVAL ENDOVASCULAR RECONSTRUCTION - CLINICAL CASES PRESENTATION AND SYSTEMATIC REVIEW PUBLICATION

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Introduction
Iliocaval thrombosis or thrombosis of the inferior vena cava (IVC) is associated with significant morbidity in the form of venous limb-threatening compromise.
Patients often present with life-limiting occlusive symptoms secondary to recurrent lower extremity deep venous thrombosis, swelling, pain, venous stasis ulcers, or phlegmasia.

Materials and Methods
A retrospective analysis, between January 2018 and September 2020, of all patients suffering chronic iliocaval or IVC thrombosis and submitted to endovascular reconstruction were taken into consideration. Background, patient selection and indications, timing of intervention, procedural steps, technical considerations, postprocedural care and outcomes were registered.
Additionally, a systematic review of the published literature between 2015 and 2020 searching MEDLINE/PubMed was performed. All published case series, case reports, potential randomized controlled trials, prospective and retrospective comparative cohort studies, and case-control studies where used for the qualitative synthesis of the systematic review.

Results
During the mentioned period, the authors found five clinical cases, 4 men, with a mean age of 58 years. Symptoms included lower extremity swelling or pain (n = 2), ulcers (n = 1), phlegmasia (n = 1), shortness of breath (n = 1).
Procedural technical success with venous recanalization was achieved in 100% with every patient presenting clinical improvement. One patient suffered a major complication, with acute renal failure.
At a mean follow-up of 13.8 months, three, six and twelve-month, primary iliocaval stent patency rates were 100%, 100%, and 75%, respectively.
From the systematic review, a total of 804 potentially eligible articles published were identified from literature searches. After screening on eligible criteria, 12 were selected for full-text review, describing 56 patients. Overall technical success was 93% with a 96% clinical improvement and a primary patency rate at 12 months of 87%.

Conclusions
Endovascular iliocaval reconstruction is an effective treatment for iliocaval thrombosis with high levels of technical success, favourable clinical outcomes and stent patency rates, and few complications.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

HEMATOLOGIC PREDICTORS OF OUTCOME IN CAROTID ENDARTERECTOMY

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Introduction
Neutrophil-to-lymphocyte ratio (NLR) and platelet-to--lymphocyte ratio (PLR) are useful markers for identifying inflammation, which is a common feature of atherosclerosis. Patients with carotid atherosclerosis are at greater risk for cerebrovascular events which cause significant morbidity and mortality.

Objectives
The aim of this review was to determine the prognostic ability of the NLR and the PLR in patients undergoing carotid endarterectomy (CEA).

Materials and Methods
A search was performed in Medline, Scopus and ISI web of knowledge in order to identify articles focused on these hematological parameters and their impact on the outcomes in patients undergoing CEA. The 30-day stroke and stroke/death rates were retrieved. Additional demographic data was meta-analysed.

Results
Platelet-Lymphocyte ratio was associated with an increased 30-day stroke rate. Additionally, an increased PLR was associated with symptomatic internal carotid artery stenosis and postoperative acute coronary syndrome in patients who underwent CEA. An elevated NLR was associated with an increased risk of cognitive dysfunction one day after CEA.

Conclusions
The NLR and PLR have prognostic value for carotid endarterectomy in the short term.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

CROSS-SECTIONAL IMAGING OF VASCULAR GRAFT INFECTIONS: A PICTORIAL REVIEW

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Introduction
Graft infections are uncommon complications of vascular procedures, with incidences ranging between 1% and 6%, depending on the anatomic location of the graft. However, these infections can have serious sequelae such as limb loss and even death, with mortality rates ascending up to 25-75%. The diagnosis of vascular graft infections is often challenging, since its clinical manifestations tend to be subtle and non-specific, and laboratory findings, although helpful, are neither sensitive nor specific. As such, cross-sectional imaging studies have an essential role in the diagnosis of vascular graft infections, and awareness for its findings among all medical professionals is crucial.

Objectives
To review the spectrum of imaging findings associated with vascular graft infections in the various cross-sectional modalities;
To propose an imaging algorithm in the evaluation of patients with suspected graft infection.

Materials and Methods
Computed Tomography (CT) and Magnetic Resonance (MRI) exams performed between January 2010 and August 2020 in the Vascular Unit of the Radiology department of a tertiary care hospital center were reviewed. Illustrative cases of vascular graft infections were selected, and appropriate clinical/pathological correlation was made when relevant. A comprehensive literature review regarding the presentation and imaging findings associated with vascular graft infections was also performed.

Results
Imaging plays a key role in confirming the diagnosis of vascular graft infections and guiding their treatment. Cross-sectional studies, particularly CT-Angiography, can precisely locate the graft or endograft, evaluate its structural integrity and extent of involvement by the inflammatory process. CT and MRI can also accurately detect the presence of peri-graft inflammation, determine the presence of associated liquid or gas and evaluate the extension of the findings. Imaging signs of anastomotic leakage, pseudoaneurysms and graft-enteric erosion/ fistula are also easily identified on both techniques. Moreover, when performed in conjunction with functional imaging (WBC scintigraphy or [^{18}F]FDG PET-CT) they allow an accurate staging of the infection. Therefore, cross-sectional imaging studies must become an integral part in the management of this condition.

Conclusions
Graft infections are relatively rare but potentially lethal complications of vascular procedures. It is essential for vascular surgeons to be able to recognize not only the clinical signs but also the imaging features that suggest vascular graft infection, so that an accurate diagnosis and appropriate treatment strategies can be selected.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

REVASCULARIZATION ALTERNATIVES IN YOUNG PATIENTS WITH AORTO-BIFEMORAL BYPASS OCCLUSION - FOR THE PURPOSES OF 3 CLINICAL CASES

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Introduction
Despite the continuous expansion of endovascular treatment in the aorto-iliac sector, the aorto-bifemoral bypass is still the gold standard for revascularization in TASC C / D occlusive disease, especially in patients with favorable surgical risk. Late occlusion of aortic grafts in young patients is challenging, as a long-term revascularization alternative is required.

Objectives
The authors present 3 clinical cases of complete late infrarenal-bifemoral aortic bypass occlusion in young patients, submitted to different forms of revascularization, favouring the maintenance of aortic inflow.

Materials and Methods
Two men and one woman, with a mean of 59 years of age, smokers, without relevant heart or lung diseases, admitted for complete late occlusion of infrarenal-bifemoral aortic bypass, two with critical ischemia and one with acute ischemia of the limbs lower.
After a study by computed tomographic angiography, they underwent revascularization using a supra-celiac-bifemoral aortic bypass, a para-renal-bifemoral aortic bypass and a bilateral femoral graft thrombectomy complemented by covered kissing stent. In all patients, revascularization of the lower limbs was successful and there were no relevant postoperative complications.

Results
After an average clinical and imaging follow-up of about one year, patients are asymptomatic and with the revascularizations in good condition.

Conclusions
The clinical cases presented show the efficacy of revascularization alternatives with maintenance of aortic inflow in patients with aorto-bifemoral bypass occlusion. Despite the increased complexity of these interventions, they are, in selected patients, safe and durable.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

JEJUNAL ARTERY ANEURYSM: OPEN TANGENCIAL RESECTION WITH VASCULAR RECONSTITUTION, A CASE REPORT

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Introduction
Jejunal artery aneurysms (JAA) are uncommon, mostly asymptomatic and many times incidental findings in imaging studies. The diagnosis before rupture is not always feasible, leading to high rupture rates of about 30%. Although endovascular repair is widely used in the treatment of these aneurysms, some patients still require open repair.

Objectives
Demonstrate the applicability of open repair in the correction of a JAA.

Materials and Methods
Report a case of a patient affected by JAA, successfully treated with open repair.

Results
A 44-year-old women with no previous relevant medical history was referred to the Vascular Surgery consultation with a suspicion of a JAA on a computed tomography (CT) scan made during the study of a persistent epigastric pain, with no other complaints. Abdominal palpation was painful in the epigastric region. Laboratory studies revealed no alterations. A CT angiography (CTA) was repeated in our Department and revealed a saccular aneurysm with 25x20 mm of diameter, in the proximal portion of the first jejunal artery. The exam also depicted a stenosis of 9 mm of extension in the celiac trunk, turning the hepatic perfusion dependent of the gastroduodenal artery flow. Endovascular repair was not suitable because of the location of the aneurysm and involvement of several arterial branches, which increased the risk of pancreatic, hepatic and intestinal ischemia. An open approach was decided. We confirmed intraoperatively the aneurysm gave rise to the inferior pancreatoduodenal artery and two duodenal branches (Figure 1). A tangential resection of the aneurysm was done, preserving the flow in the jejunal artery. Arterial closure was performed with laterotterminal anastomosis between the jejunal artery and the bevelled pancreatoduodenal artery. One of the duodenal branches was also re-implanted in the jejunal artery in a laterotterminal fashion. A continuous suture with a non-absorbable 6/0 suture were used for both anastomoses. At the end of the procedure no ischemic signs were evident in the duodenum and jejunum and it was decided to not re-implant the other duodenal branch. The patient's post-operative course was uneventful. One month after the surgery, the patient was asymptomatic, with no abdominal pain and CTA confirmed the patency of the reconstructed arteries.

Conclusions
All symptomatic JAAs and those >2 cm must be treated. Open approach has some advantages, including direct inspection for intestinal and hepatic ischemia and vascular re-implantation, if necessary, as highlighted in this case.

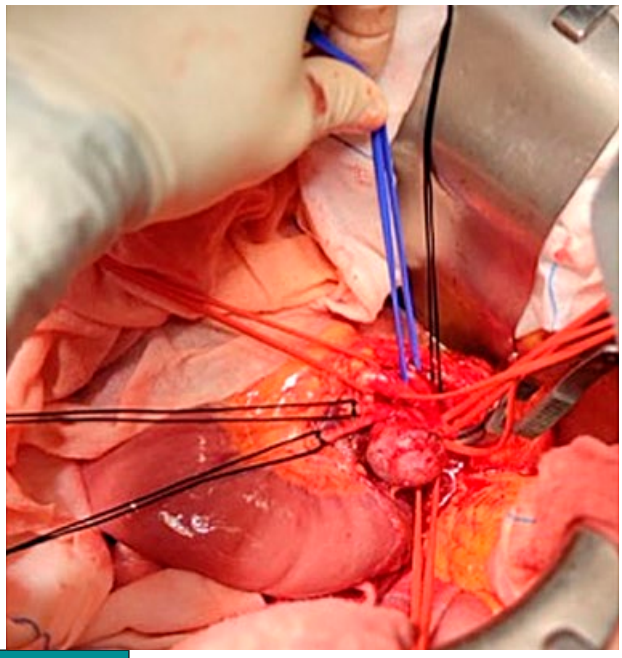

Figure 1 *Intraoperative aspect of the aneurysm.*

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

SYMPTOMATIC PHARYNGOESOPHAGEAL COMPRESSION DUE TO VASCULAR ANOMALIES: A REPORT OF TWO RARE CASES

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Introduction
Esophageal compression due to vascular anomalies is well known since Bayford's description of dysphagia lusoria in 1787. This condition is due to an aberrant origin of the right subclavian artery and is the most common vascular variation associated with symptomatic esophageal compression. Other vascular anomalies can also lead to dysphagia being extremely uncommon.

Objectives
We present two clinical cases of different vascular anomalies with consequent symptomatic pharyngeal or esophageal compression.

Materials and Methods
The clinical process of two patients with dysphagia associated with vascular anomalies was reviewed. Clinical and iconographic data were collected.

Results
A 77-year-old man, with multiple vascular risk factors, with a history of atrial fibrillation, had been followed for a descending thoracic aortic aneurysm. The last computed tomography angiography (CTA) performed showed a descending thoracic aorta diameter of 42mm. Two years after this last control, the patient starts complaints of gradual worsening dysphagia predominantly for solids. Clinical investigation

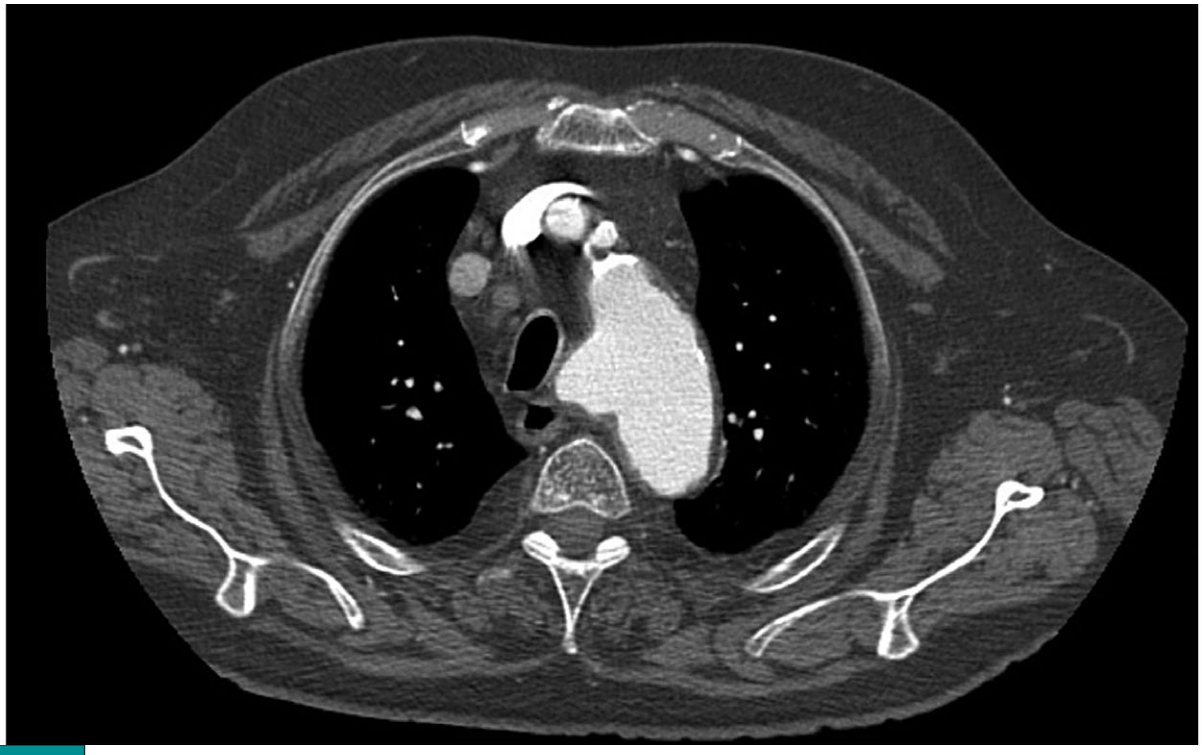

Figure 1 *Penetrating aortic ulcer in the medial portion of the aortic arch, conditioning deviation of the mediastinum with compression of the adjacent trachea and esophagus.*

Figure 2 *Left internal carotid artery kinking with marked pharyngeal compression.*

did not reveal a defined etiology. Thus, the patient repeated the CTA, which revealed the presence of a penetrating aortic ulcer in the medial portion of the aortic arch, about 18 mm deep, conditioning marked compression of the adjacent trachea and esophagus (fig 1). The patient was proposed to perform a hybrid treatment with TEVAR plus surgical de--branching of the aortic arch using a carotid-carotid and a carotid-subclavian bypass.

A 62-year-old woman with a history of obesity and epilepsy, presents with dysphagia mainly for solids with several months of evolution and occasional episodes of choking. After the most common causes have been excluded, a CTA of the cervical and thoracic region was performed, which revealed the presence of a left internal carotid artery kinking with marked pharyngeal compression (fig 2). Bearing in mind that the complaints conditioned her a marked reduction in the quality of life, surgical correction was proposed. The patient underwent vascular reconstruction surgery with excision of the redundant segment of the internal carotid artery and direct end-to-end anastomosis. The patient showed a marked improvement in quality of life. At the follow-up, 14 days after the procedure, she no longer had symptoms of dysphagia.

Conclusions

Overall, vascular anomalies are very rare causes of dysphagia, and are often diagnosed in imaging studies after the most common causes have been excluded. When compressive symptoms condition a significant impact in quality of lie, invasive treatment should be considered, however the therapeutic decision must be individualized.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

LEMIERRE'S SYNDROME: CASE REPORT OF 'THE FORGOTTEN DISEASE' IN CURRENT COVID-19 PANDEMIC

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Introduction

Lemierre's syndrome (LS) refers to infectious thrombophlebitis of the internal jugular vein (IJV) developed as a complication of an oropharyngeal infection. It is a serious condition which may lead to septicemia and septic embolization. LS is most frequently caused by the anaerobic *Fusobacterium necrophorum*. In the current post-antibiotic era, it is rare (annual incidence of 0.8 cases/million). Many clinicians are unaware of LS, leading it to be termed "the forgotten disease." Signs and symptoms include odynophagia, fever and easy fatigue simulating, among others, infection by COVID-19. Broad spectrum antibiotherapy should be started promptly. If a deep abscess is present, drainage is indicated. In cases of persistent sepsis or embolization, surgical ligation/excision of the IJV may be considered. Currently, the most controversial role in LS management is anticoagulation. Compared with pre-antibiotic era mortality has much improved (0–18%). Since 2004 there are only four cases of LS reported in Portugal (Medline).

Objectives

To report a case of late diagnosis and highlight the pitfalls due to initial suspicion of COVID-19 infection.

Materials and Methods

Case report. A 37-year-old female presented to our institution with left-sided neck pain, odynophagia and fever. A diagnosis of tonsillitis was made, and the patient was discharged. COVID-19 nasopharyngeal-swab-test was negative. One week later, due to persistent fever, dyspnea, thoracalgia and easy fatigue the patient returned. Blood samples showed increased white-cell-count (17.150/μL) and C-reactive-protein (378 mg/L). On CT, areas of diffuse pulmonary infiltrates were consistent with COVID-19 infection. The patient was transferred to COVID-19 area and started ceftriaxone, azithromycin and hydroxychloroquine. On day 4, considering 3 negative tests hydroxychloroquine was abandoned. Diagnosis of an atypical pneumonia was made and antibiotherapy was changed to doxycycline and

Figure 1 *Septic thrombosis of left internal jugular vein: coronal (4.78 cm), axial (0.52 cm) and sagittal (4.76 cm) views from contrast-enhanced computed tomography.*

ceftazidime. Due to moderate size pleural effusion a thoracentesis was performed. On day 7, as cervical pain and tumefaction were persisting, a contrast-enhanced cervical CT was ordered, showing peritonsillar thickening and thrombosis of the left IJV with emphysema (Figure 1). Antibiotherapy was changed to Piperacillin-Tazobactam and anticoagulation was started.

Results

After 2 weeks, inflammatory markers were normal and a reduction in pulmonary opacities was observed. All microbiological cultures were negative. The patient completed the last 3 weeks of antibiotherapy under ambulatory hospitalization. Screening for thrombophilia was negative. Anticoagulation was kept for 3 months.

Conclusions

In a patient with former oropharyngeal infection presenting with pneumonia, LS should be suspected. Broad spectrum antibiotherapy should include anaerobic coverage. Anticoagulation may hasten local infection control and prevent septic embolization, optimizing pneumonia resolution.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

PEDAL ACCELERATION TIME - A NEW METHOD OF DIAGNOSIS AND PROGNOSIS IN PERIPHERAL ARTERIOPATHY

Andreia Pinelo[1]; Luís Loureiro[1]; Sérgio Teixeira[1]; João Castro[1]; Carlos Veterano[1]; Inês Antunes[1]; Carlos Veiga[1]; Daniel Mendes[1]; Henrique Rocha[1]; Rui Almeida[1]

1 - Centro Hospitalar e Universitário do Porto

Introduction

It is well recognized that the Ankle-Arm Index is unreliable in the diagnosis and prognosis of peripheral arteriopathy in patients with incompressible vessels, such as diabetics and chronic kidney patients. It is therefore important to define alternative strategies for assessing distal perfusion in this population. Arterial Doppler, a non-invasive technique available in any vascular laboratory, can be used to directly assess foot perfusion by interrogating the plantar arch and its nourishing arteries. This technique, recently described and still not widespread, can help to overcome the diagnostic limitations of ABI.

Objectives

This work aims to review the model and the results obtained with the evaluation of the Pedal Acceleration Time (PAT) as well as to evaluate its practical applicability.

Materials and Methods

In an initial phase, the recently published literature on the topic was analysed. Subsequently, the clinical applicability of the technique was tested in 2 non-diabetic and non-revascularized patients, admitted to the Angiology and Vascular Surgery Service of our center. In both, the acceleration time of the systolic flow, measured in milliseconds, were evaluated in the Arched, Plantar Medial, Lateral Plantar and Deep Plantar Arteries.

Results

In patient A, with ABI of 0.27, the acceleration time in the 4 evaluated arteries varied between 210-260ms, values that according to standardization in the literature fall into a category of moderate to severe ischemia. Patient B, with a 0.35 ABI, had low-amplitude monophasic flows in all arteries, failing to obtain a correct measurement of the acceleration time. Thus, the morphology of the curve has become a limitation for the application of this modality. The technical complexity, time consuming, with an average duration of the exam of 30-40 minutes, were other limitations found, also revealing an exam with some discomfort for the patient with ischemic rest pain.

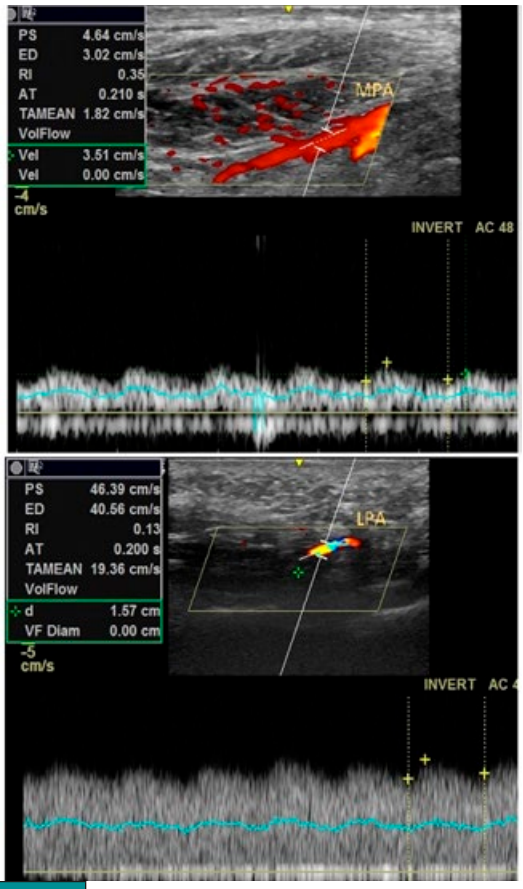

Figure 1 *Ultrasound view of the Medial and Lateral Plantar Arteries.*

Conclusions

In patient A, the values obtained by measuring the PAT were comparable in severity of ischemia with the ABI, with the advantage of demonstrating with greater specificity the perfusion defects corresponding to each angiosome. However, it would be important to understand the reliability of this test in patients with incompressible arteries and the ease of its clinical application, taking into account their technical requirements.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

INFECTED EVAR ENDOGRAFT - A LESSON TO BE LEARNED

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Introduction
Endograft (EG) infection after endovascular aneurysm repair (EVAR) represents one of the most serious complications. Although the incidence of EG is below 1%, it is often associated with high mortality and morbidity rates. The therapeutic options are limited and should be individualized based on patient's general condition and co-morbidities.

Objectives
Regarding a clinical case of EVAR EG infection, a review is made on the difficult management of these patients.

Materials and Methods
We report a 72-years old male patient with medical history of hypertension, chronic tobacco abuse and peripheral artery disease. The patient was hospitalized in the ER for hematemesis. He made an endoscopy that showed a bulbar ulcer and a CT-scan that revealed an abdominal aneurysm with 6.5 cm and contained rupture. He was submitted to EVAR with a bifurcated EG (Endurant -2s Medtronic) without subsequent episodes of gastrointestinal bleeding. The patient was discharged uneventful on the 10th day and two months later he was re-admitted due to fever and lower back pain. Urine and blood cultures were negative, and the CT-scan revealed a left abscess around the psoas muscle and air around the prothesis. We started an empirical antibiotic (AB) course (six weeks of Meropenem and Vancomycin) with resolution of septic symptoms. One and a half year later, he returned to the ER due to same complains of fever and back pain. Once again, he was treated empirically with the same antibiotics and good results for another half year. Since then he had 4 episodes of fever with progressively shorter periods of remission (monthly). Therefore, he was proposed for removal of the stent graft. A staged procedure was chosen which consisted in axillo-bi-femoral bypass with silver coated graft, followed by prothesis removal and resection of the aneurysm sac with direct closure of the aortic stump. In laparotomy we observed an aorto-enteric (duodenum) fistula, which was assumed as primary. The duodenum was closed with primary repair and the aortic stump reinforced with greater omentum. Intraoperative cultures coming from the sac and the EG specimen were positive for *Escherichia coli* and *Candida albicans*. Anti-mycotic therapy (Fluconazol) and specific antibiotics (ampicilin) were used for 15 days. He was discharged from our hospital in a very stable and good general condition.

Results
The treatment options for endograft infections are complex and include the removal of the graft or conservative treatment for patients which are not suitable for surgery. In this case there were several factors that increased the surgical risk: removal of a stent graft in a poor-risk patient; the supra-renal fixation of endograft and his peripheral artery disease. This has significantly delayed the correct intervention. However, when the decision was made, we favoured the extra-anatomic bypass because a recent systematic review showed that this surgery was the best option particularly in frail patients.

Conclusions
Infected EVAR is a very complex and devastating complication that should raise suspicion about the presence of a hidden enteric aortic fistula. A good combination between conservative and surgical intervention when possible with staged aortic reconstruction lead to a better outcome.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

A RARE CASE OF A GIANT SPLENIC ARTERY ANEURYSM: A SIMPLE APPROACH FOR A COMPLEX PATHOLOGY

Leandro Nóbrega[1]; Filipa Jácome[1]; Ricardo Castro Ferreira[1]; Pedro Paz Dias[1]; José Teixeira[1]

1 - CHSJ

Introduction
Splenic artery aneurysms (SAA) represent the most common visceral aneurysms. They are more frequent in women and their incidence increases with age, hypertension and multiparity. They are rarely symptomatic and so are mostly incidental findings. Treatment options include several open or endovascular techniques.

Objectives
Demonstrate the potential of a simple endovascular approach in a complex SAA.

Materials and Methods
Report on a case giant SAA treated successfully with an endovascular approach.

Results
A 58-year-old female patient was sent to the emergency department after an incidental finding of a giant SAA in an MRI due to chronic abdominal pain. A CT scan was made which confirmed a distal SAA with a diameter of 90 mm. The case was discussed with radiology and general surgery and it was decided that endovascular therapy was the best approach. The patient underwent proximal plug embolization of the splenic artery. The procedure was done without complications. In the post-operative period, there was no complication and no pain associated with the recovery. Ultrasonography before discharge revealed a near total thrombosed SAA.

Conclusions
Giant SAA are a rare entity that may appear as a difficult pathology to treat successfully. Their high risk of rupture makes their treatment an emergency that may require a collaboration with other medical specialties. An endovascular first approach can be a good treatment choice to minimize the rupture risk and to facilitate an open surgical repair when endovascular treatment is not satisfactory.

VASCULAR SURGERY - SHORT ORAL COMMUNICATIONS

GIANT ANASTOMOTIC ANEURYSM AS A LATE AORTOBIFEMORAL BYPASS COMPLICATION

Leandro Nóbrega[1]; Filipa Jácome[1]; Ricardo Castro Ferreira[1]; Paulo Gonçalves Dias[1]; Pedro Paz Dias[1]; José Teixeira[1]

1 - CHSJ

Introduction
Lower extremity chronic arterial disease is one of the most prevalent atherosclerotic diseases in the world and has a significant impact on patients' daily activities. When there is extensive aortoiliac occlusive disease, aortobifemoral bypass (ABF) remains the best option for fit patients with excellent long-term results. One of the possible late complications are anastomotic aneurysms. These can occur up until 5% of patients. For femoral aneurysms, treatment is recommended when larger than 2 cm.

Objectives
Describe a case of a complex giant anastomotic femoral aneurysm as a late complication of an ABF.

Materials and Methods
Report on successfully surgical treatment of a giant femoral anastomotic aneurysm.

Results
A 48 years-old male patient with an ABF made in 2015 came to the emergency department with a pulsatile femoral mass in the left lower limb associated with local pain. The CT scan made at the admission revealed a true femoral anastomotic aneurysm with 9 cm. Ultrasonography revealed a thrombosed common femoral artery, but a patent popliteal artery. The patient was treated by aneurismectomy and interposition graft between the left branch of the previous ABF and the popliteal artery. It was not possible to reconnect the profunda femoral artery. The main complication after the surgery was a lymphatic drainage with the need of surgical revision. In the follow up appointment the patient maintained a patent interposition graft with palpable distal pulses.

Conclusions
Giant anastomotic aneurisms are a rare entity than can present a significant challenge in the daily practice. In this work we show a giant aneurism successfully treated with a surgical approach without major consequences while being able to preserve the ABF to maintain blood flow to the lower limb.