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de Cirurgia Cardio-Torácica e Vascular
Hospital Beatriz Ângelo, Loures

Congresso SPCCTV 4D Visions 18

Welcome to SPCCTV 4D Visions18

Caros sócios,

Dou-vos as boas vindas ao congresso anual da Sociedade Portuguesa de Cirurgia Cardio-Torácica e Vascular (SPCCTV). Corolário do trabalho realizado pelos sócios e pela direção, esta reunião constitui o ponto de encontro de várias gerações de cirurgiões, unidos pela dedicação ao tratamento das múltiplas patologias que se agregam nesta sociedade científica. Este espírito de partilha de experiências e cooperação foi, desde a criação da SPCCTV há mais de 30 anos, o motor e a grande força desta sociedade. Este espírito, não só permanece vivo, como se enraizou mais profundamente no nosso ADN, fortalecido pelas adversidades com que naturalmente se depara qualquer instituição com tão longo percurso. Mas nem só na dificuldade encontrámos a força para prevalecer e melhorar. Fizemo-lo sobretudo pela exigência dos nossos sócios, em especial dos mais jovens. Exigência de uma sociedade que sirva realmente os seus interesses formativos e científicos, com qualidade nas ações que promove e nas causas que suporta. Escutámo-los e tentámos ir ao encontro destas pretensões, para que, cada vez mais, se identifiquem com a sociedade e a sintam como sua. Pensamos ser a forma mais digna de assegurar a continuidade da SPCCTV e de prestar homenagem a todos aqueles que a ela se têm dedicado.

O congresso SPCCTV 4DVisions18, segue o modelo de sucesso que estreámos em 2017. Este ano, temos a honra de contar com a Associação Portuguesa de Intervenção Cardiovascular (APIC) para representar a 4ª dimensão/visão da patologia cardiovascular, facto que será seguramente uma enorme mais-valia para todos os participantes. A APIC constitui um parceiro óbvio para este evento, pois representa aqueles que já o são, verdadeiramente, no nosso dia-a-dia. A visão intervencionista, outrora tão distante da prática clínica do cirurgião cardíaco e vascular, é hoje em dia partilhada por todos estes protagonistas. Numa era em que, cada vez mais, se adotam técnicas minimamente invasivas, deparamo-nos com um número crescente de procedimentos que necessitam de colaboração multidisciplinar, com vista a oferecer o melhor tratamento a um grupo de doentes altamente complexo. Não obstante a intervenção cardiovascular ser parte integrante do nosso armamentário terapêutico, seguramente temos muito que aprender e partilhar com aqueles que foram pioneiros nesta área. O mote deste congresso – "The grey zone" – incorpora o espirito de debate que se pretende num evento que celebra a multidisciplinaridade.

Além da honrosa parceria com a APIC, o nosso programa conta com um vasto painel de especialistas nacionais e internacionais e com cursos pré-congresso, no âmbito da academia SPCCTV, constituindo oportunidades únicas para uma aprendizagem de carácter prático. É de salientar que vários destes cursos foram pensados e organizados pelos nossos clubes de internos, dando voz e resposta às necessidades daqueles para quem a formação é ainda mais importante. Além das habituais comunicações livres, procurámos dar mais tempo de antena aos nossos internos e reeditámos a sessão Arena dos Leões, formato de sucesso patenteado pela SPCCTV e que vai seguramente continuar a dar que falar, com a apresentação de casos polémicos pelos futuros especialistas.

Nada disto seria possível sem o apoio da industria, que, mais uma vez, reiterou a confiança na SPCCTV, espelhando a relevância cientifica do trabalho realizado e a importância da reunião no panorama nacional.

Por último, e porque o congresso SPCCTV 4DVisions18 é também um momento de confraternização, convido todos os sócios a participar no programa social, que contará com uma clinica de Stand-up Paddle e com um jantar seguido de festa na discoteca Le Club.

Conto convosco, porque juntos somos mais fortes.

Bem vindos ao SPCCTV 4DVisions18!

Gonçalo Cabral
Secretário-Geral da SPCCTV

EDITORIAL

Miguel Guerra
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Professor da Faculdade de Medicina do Porto

O médico, o gestor e a inovação! O bom, o mau e o vilão!

The doctor, the boss and the innovation! The good, the bad and the ugly!

As organizações de saúde são estruturas muito complexas e com grande dinamismo, onde a volatilidade do conhecimento e das tecnologias se associam às alterações do próprio padrão epidemiológico da procura. Diante esse cenário é hoje inquestionável a necessidade de mudanças e renovações contínuas dentro das organizações para que possam enfrentar o desafio do mundo moderno.

O objectivo da gestão em saúde é criar as condições para, sem perda de eficiência, majorar a flexibilidade e a capacidade de adaptação aos processos contínuos de mudança. As pretensões dos médicos cada vez mais inconformados ***(o bom)***, as medidas reguladoras pontualmente contraditórias do gestor ***(o mau)*** e a rápida evolução científica, tecnológica e da inovação ***(o vilão)***, constituem, por si só, um enorme desafio *(ou fardo pesado)* para qualquer responsável pela administração dos serviços de saúde. Acresce a expectativa dos utentes *(o alvo)* cada vez mais informados e a crescente exigência das populações em termo de qualidade e de celeridade de resposta aos seus anseios e necessidades.

De facto, a implementação e o desenvolvimento de um serviço de saúde, bem como o desenho do seu perfil assistencial, devem estar subordinados às necessidade e expectativas dos utentes. O doente é o propósito principal e todo o trabalho terá que estar necessariamente subordinado aos seus interesses e necessidades, de forma a encontrar as melhores soluções para a prestação de cuidados de saúde *(patient-centered medicine)*. A relação médico-doente, que lida com valores únicos, como a vida, a morte, a saúde, o sofrimento e o bem-estar, deverá estar sempre presente no âmbito da sua missão, nos recursos que mobiliza, nos processos que dinamiza, na produção e nos resultados obtidos *(patient-centered management)*.

Entre os desafios mais importantes da gestão em saúde, encontra-se a capacidade de promover ações que garantam, simultaneamente: aos cidadãos, o acesso em termo útil aos cuidados de que necessitam (equidade); aos serviços de saúde, que tenham os recursos de que necessitam para prestar esses cuidados (efectividade); e ao sistema de saúde, que consiga responder às necessidades dos cidadãos e dos serviços utilizando apenas os recursos adequados para tal (eficiência). No fundo, alcançar resultados adequados para os recursos despendidos e obter o custo mínimo para o nível de volume e qualidade assistencial que sejam definidos *(value for money)*.

Na verdade, os sistemas de saúde ostentam preocupações crescentes que se prendem não só com a iniquidade no acesso e garantia de satisfação das necessidades em saúde, mas também com a dificuldade em conter o crescimento da despesa, em virtude do envelhecimento da população, do desenvolvimento de novas tecnologias, aumento na oferta de cuidados, bem como do crescimento acentuado das expectativas e exigências dos cidadãos. O actual modelo de organização dos sistemas de saúde, centrado na oferta, está esgotado. Importa, pois, introduzir a mudança de paradigma, que passa por pensar o sistema na perspectiva da procura, privilegiando os resultados e a retribuição por objectivos com base em indicadores fiáveis de controlo da atividade, não só em termos de quantidade, mas essencialmente, de qualidade.

Por outro lado, a inovação e o desenvolvimento devem ser encorajados e estimulados, o que se traduzirá em contexturas menos hierárquicas e na descentralização da tomada de decisão. É necessário privilegiar uma relação aberta e concreta, uma partilha de valores e um consentimento para correr alguns riscos. Contudo, a tecnologia deve ser gerida de modo benificiário e com análise custo-benefício, uma vez que esta acaba por ser matéria

de conveniência de múltiplos grupos com informação suficiente para influenciarem o desenvolvimento da tecnologia, a sua aquisição, o seu uso e pagamento. É necessário perceber os motivos que levam ao êxito de certas tecnologias e à renúncia de outras, de forma a evitar investir em determinadas tecnologias que conseguem trazer apenas benefícios limitados à generalidade da população em detrimento de outras que conseguirão ser mais simples, mas trarão mais capacidade e qualidade em global (relação valor/custo).

Porém, não há inovação sem liderança! Com a pressão que se exerce nas organizações de saúde, para que sejam alcançados os objetivos não só económicos, mas também sociais, exige-se lideranças e líderes astutos, que saibam instituir empatia com os seus colaboradores, mas, e acima de tudo, que saibam compreender os sinais que a parte externa projeta, que interajam com ela e que sejam flexíveis o suficiente de modo a responder em tempo oportuno.

O Editor-Chefe | Miguel Guerra

SUBSTITUIÇÃO DA VÁLVULA AÓRTICA POR ESTERNOTOMIA PARCIAL VERSUS ESTERNOTOMIA COMPLETA: EXPERIÊNCIA DE UM CENTRO

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Resumo

Introdução: a esternotomia completa (EC) é a abordagem *gold standard* da cirurgia de substituição valvular aórtica (SVA). Contudo, as potenciais vantagens de uma abordagem menos traumática promoveram o desenvolvimento de procedimentos minimamente invasivos, incluindo a mini-esternotomia (ME).

Objetivo: comparar resultados clínicos no pós-operatório imediato e mortalidade, após SVA por ME e EC.

Métodos: estudo retrospetivo unicêntrico incluindo todos os doentes submetidos a SVA isolada por ME, de 1 de janeiro de 2011 a 31 de julho de 2017, emparelhados com doentes submetidos ao mesmo procedimento, pelos mesmos cirurgiões por EC. Utilizou-se o método de emparelhamento *coarsened exact matching* para as variáveis idade, género, índice massa-corporal e diabetes *mellitus*. Os grupos foram caracterizados e comparados quanto aos resultados no pós-operatório imediato através de testes Qui-quadrado e Mann-Whitney e quanto à sobrevida através de curvas de *Kaplan-Meier*.

Resultados: foram incluídos 82 doentes (n=41 em cada grupo). Os tempos de clampagem aórtica [78 vs. 63 minutos, p=0,001] e de circulação extracorporal [107 *vs.* 90 minutos, p=0.002] foram significativamente superiores no grupo ME vs. EC, respetivamente. Embora a frequência de transfusões sanguíneas durante a cirurgia fosse menor no grupo ME, essa diferença não foi estatisticamente significativa (39,0% *vs.* 53,7%, p=0,184). Os resultados foram semelhantes relativamente ao tempo de ventilação mecânica, suporte inotrópico, infusão de morfina, tempo de permanência em unidade de cuidados intensivos e incidência de fibrilação auricular *de novo*. A sobrevida cumulativa aos 6 anos foi de 86,7% após ME e 88,5% após EC (p=0,650).

Conclusões: a SVA por ME parece ser uma alternativa segura comparativamente ao gold standard EC.

Abstract

Mini-sternotomy versus full sternotomy aortic valve replacement: a single-centre experience

Background: *full sternotomy (FS) is the gold standard approach to perform surgical aortic valve replacement (AVR). However, potential advantages of a less traumatic approach fomented the development of so-called minimally invasive procedures, which include upper mini-sternotomy (MS).*

Objective: *to compare immediate postoperative clinical results and mid-term mortality after AVR through MS and FS.*

Methods: *single-centre retrospective study including all patients who underwent isolated AVR through MS between January 1, 2011 and July 31, 2017. These were then matched with patients who underwent the same procedure through FS and by the same surgeons who performed MS, using coarsened exact matching for the variables age, gender, body mass index and diabetes mellitus. Groups were later characterized and compared regarding postoperative results using Qui-squared and Mann-Whitney tests and regarding mid-term mortality through Kaplan-Meier curves.*

Results: *we included 82 patients (n=41 in each group). Aortic cross clamp [78 vs. 63 minutes, p=0.001] and cardiopulmonary bypass times [107 vs. 90 minutes, p=0.002] were significantly longer in the MS group vs. FS group, respectively. Although without reaching statistical significant difference, a smaller percentage of patients from the MS group required red blood cells transfusions during surgery (39.0% vs. 53.7%, p=0.184). Similar results were found regarding mechanical ventilation, inotropic support, morphine infusion, intensive care unit length of stay and incidence of de novo atrial fibrillation. Cumulative survival at 6 years was 86.7% after MS and 88.5% after FS (p=0.650).*

Conclusions: *Aortic valve replacement through MS seems to be a safe alternative to the gold standard FS.*

INTRODUCTION

Aortic valve pathology is a worldwide disease that is continuously rising due to ageing of population and affects approximately 2% of adult population in developed countries.[1,2] Surgical aortic valve replacement (AVR) through full sternotomy (FS) remains the gold standard approach, leading to the complete splitting of the sternum throughout its entire length.[1-4] However, over the past 25 years, the potential advantage of a less traumatic approach fomented the development of so-called minimally invasive procedures.[2-4]

The first report of AVR through a less invasive technique was in 1993 by Rao and Kumar through a right thoracotomy.[2,5,6] Since then, several approaches had been developed for AVR and in 2008, the American Heart Association defined minimally invasive cardiac surgery as "a small chest wall incision that does not include the conventional full sternotomy".[7] The most commonly used minimally invasive approaches are upper mini-sternotomy (MS) and right anterior thoracotomy (RT) incision,[2-5] being the former the preferred method.[1]

The main aim of minimally invasive approach is to reduce surgical trauma, while providing durable and safe valve repair or replacement.[5,6,8] Current evidence suggests that these approaches are associated with excellent early and late outcomes.[2] When compared with FS, MS has been associated with equivalent postoperative morbidity and mortality.[1,3,6] On the other side, several studies suggest improved outcomes with MS as reduced time at intensive care unit (ICU) and hospital length of stay, shorter invasive mechanical ventilation time, decreased postoperative pain, blood loss and incidence of *de novo* atrial fibrillation (AF) and evidently better cosmetic results.[1,5,9,10]

Despite the referred potential advantages of MS over FS, the last remains the most widely used approach for patients requiring AVR and there are no standardized criteria to assist the decision to perform a less invasive approach.[2]

In this study we aimed to compare immediate postoperative clinical results and mid-term mortality after AVR through upper MS and conventional FS.

METHODS

Study design and sample

This is a single-centre and retrospective study including all subjects who underwent isolated AVR through upper MS at *Centro Hospitalar São João*, between January 1, 2010 and July 31, 2017. These patients were then matched using a pre-existing centre database, filtered by the same procedure through FS and by the same surgeons who performed MS.

The preoperative, surgical and immediate postoperative data were retrospectively evaluated through the access of clinical files and computer registry system. A National Registry ("Registo Nacional de Utentes") was used to assess mortality in February 2018.

Surgical technique

Conventional FS was performed trough a midline sternal incision from the apex of xiphoid process to the sternal notch.

Minimally invasive approach comprehends a midline sternal incision beginning at sternal notch until fourth intercostal space where this sternotomy is extended to patient's right side forming a J, leading to an upper-MS.

Regardless the surgical approach, identical protocols were used relatively to anaesthetic technique, cannulation for cardiopulmonary bypass (CPB) or myocardial protection. Standard techniques were used to remove native aortic valve followed by standard insertion of prosthesis as well as valve hemodynamics evaluation.

Variables

Demographic data, main cardiovascular risk factors, analytical data, results of complementary diagnostic exams, medication, symptoms and other comorbidities were recorded. The surgical variables included CPB and aortic cross-clamping times and number of red blood cells (RBC) transfusions. Postoperative early and late complications were evaluated as well as results of the immediate postoperative period, namely, biochemical and inflammatory markers data, morphine infusion, need of inotropic support, mechanical ventilation time, postoperative *de novo* AF, sternal wound infection or dehiscence, hospitalization time and in-hospital mortality. Variables description is shown in Table 1.

Statistical analysis

Categorical variables are presented in absolute values and in valid percentages (excluding missing data), and the continuous variables as mean and standard deviation, or median and minimum and maximum, according to data distribution.

Table 1 **Variable**

	Description
Age	in years, at the time of surgery
Gender	female/male
Body mass index	Kg/m2, [weight/(height)2]
Diabetes mellitus	no/yes – diabetes recorded regardless type of treatment
Arterial hypertension	no/yes
Dislipidemia	no/yes
Active smoker	no/yes – active smoker at the time of surgery
Previous myocardial infarction	no/yes – history of previous myocardial infarction
Cerebrovascular disease	no/yes – stroke, transient ischemic attack, carotid surgery, carotid occlusion or carotid stenosis superior to 50%
Severe Chronic Kidney Disease	no/yes – creatinine clearance inferior to 50ml/min or dialysis
Chronic pulmonary disease	no/yes – chronic obstructive pulmonary disease
Peripheral arterial disease	no/yes – history of claudication or previous/planned intervention on the limb arteries
Functional Classification	New York Heart Association class I/II/III/IV
Angina Pectoris	Canadian Cardiovascular Society grade I/II/III/IV
Left ventricle systolic function (echocardiographic evaluation prior to surgery)	normal-mildly depressed (LVEF≥40%); moderately-severely depressed (LVEF<40%)
EuroSCORE II	European System for Cardiac Operative Risk Evaluation
Transfusions	units of red blood cells transfused
Inotropic support	no/yes – if one or more amines were administered after surgery
Analgesia requirements	total milligrams of morphine administrated in the first 72 hours
Renal failure	no/yes – if creatinine raises more than 100% after surgery comparing with previous creatinine
Cerebrovascular events	no/yes – stroke or transient ischemic attack after surgery
In-hospital mortality	no/yes – at the same episode or up to 30 days after surgery

Age, gender, body mass index and diabetes mellitus were considered to matching using coarsened exact matching (CEM) to find a better balance between the two studied groups. Covariate assessment was done using standardized mean difference (SMD).

Depending on data distribution, two-independent t test or Mann-Whitney test and Qui-squared or Fisher exact test were used to compare continuous and categorical variables between groups, respectively.

Logistic regressions were done to estimate odds ratio (OR) and 95% confidence intervals (CI) of study group for each categorical endpoint. Continuous endpoints (surgical times, invasive mechanical ventilation time, morphine infusion and hospitalization times) were categorized using total sample median as cut off point.

Survival endpoint was assessed by Kaplan-Meier curves and compared through Log-Rank test.

The level of significance was set at 0.05. The IBM–SPSS Statistics version 22.0 (IBM, United States of America) program and Stata 13.0 were used in data management and statistical analysis.

Ethical aspects

This study was carried out in accordance with the principles of the Helsinki Declaration and the confidentiality of the data was safeguarded. Given the retrospective and observational component of the study, obtaining free and informed consent was discharged. This study was approved by the Ethics Committee and Administration Board of *Centro Hospitalar São João*.

RESULTS

Patients characteristics

During the study period, three surgeons performed 49 isolated AVR by MS at our centre. We obtained 82 matched patients after coarsened exact matching, mean age 70±8 years, 51.2% being female. A summary of patients' demographics and risk factors is depicted in Table 2. There were no significant differences between both groups regarding baseline characteristics except for NYHA functional classification, with the FS group having significantly higher class than MS group (NYHA class ≥ III: 34.1% *vs* 10.3%, p=0.011).

Surgical characterization

Intraoperative characteristics of the two groups of patients are detailed in Table 3. Regarding surgical characteristics, MS group had significantly longer aortic cross-clamping [78 minutes (52 to 99) *vs.* 63 (39 to 112), p=0.001] and CPB times [107 minutes (69 to 138) vs. 90 (55 to 163), p=0.002] than FS group. Although without reaching statistical significant difference, we found a tendency for a smaller percentage of patients from the MS group to require RBC transfusions during surgery (39.0% *vs.* 53.7%, p=0.184). We found no differences regarding prosthesis size or type between groups, being the total

Table 2 **Demographic data**

	Total (n=82)	FS (n=41)	MS (n=41)	*p value*	*SMD (%)*
Age [mean (SD)]	70 (8)	70(8)	70(9)	NA	2.00
Feminine sex [n (%)]	42(51.2)	21(51.2)	21(51.2)	NA	0.00
BMI [mean (SD)]	26.69 (3.81)	26.54 (3.94)	26.84 (3.72)	NA	0.00
Diabetes mellitus [n (%)]	40 (24.4)	20 (24.4)	20 (24.4)	NA	0.00
Arterial hypertension[n (%)]	62 (75.6)	32 (78.0)	30 (73.2)	0.607	-
Dislipidemia [n (%)]	59 (72)	28 (68.3)	31 (75.6)	0.461	-
Active smoker [n (%)]	6 (7.3)	5 (12.2)	1 (2.4)	0.201	-
Previous MI [n (%)]	2 (2.4)	0 (0.0)	2 (4.9)	0.494	-
Cerebrovascular disease [n (%)]	4 (4.9)	1 (2.4)	3 (7.3)	0.616	-
Severe CKD [n (%)]	9 (12.5)	5 (12.5)	4 (12.5)	0.954	-
COPD [n (%)]	26 (32.1)	13 (31.7)	13 (32.5)	0.939	-
PAD [n (%)]	4 (4.9)	2 (4.9)	2 (4.9)	0.999	-
NYHA class ≥ III [n (%)]	18 (22.5)	14 (34.1)	4 (10.3)	0.011	-
CCS with angina [n (%)]	64 (78.0)	32 (78.0)	32 (78.0)	0.999	-
LV dysfunction mod-sev [n (%)]	6 (7.5)	3 (7.5)	3 (7.5)	0.999	-
EUROSCORE II [median (min;max)]	1.40 (0.56;21.01)	1.48 (0.56;21.01)	1.09 (0.56;3.85)	0.174	-

BMI, Body mass index; CCS, Canadian Cardiovascular Society; COPD, Chronic obstructive pulmonary disease; CKD, Chronic Kidney Disease; EuroSCORE II, European System for Cardiac Operative Risk Evaluation; LV, left ventricular; MI, myocardial infarction; mod-sev, moderate-severe; NA, not-applicable; NYHA, New York Heart Association functional class; PAD, Peripheral arterial disease; SD, standard deviation, SMD standardized mean difference.

Table 3 **Demographic data**

	Total (n=82)	FS (n=41)	MS (n=41)	*p value*
CPB time, minutes [median (min;max)]	100 (55;163)	90 (55;163)	107 (69;138)	0.002
Cross-clamp time, minutes [median (min;max)]	72 (39;112)	63 (39;112)	78 (52;99)	0.001
RBC transfusion [n (%)]	38 (46.3)	22 (53.7)	16 (39.0)	0.184
Prosthesis type [n (%)] Mechanic Biologic	 7 (8.5) 75 (91.5)	 4 (9.8) 37 (90.2)	 3(7.3) 38 (92.7)	0.999
Prosthesis size [mean (SD)]	23 (2)	23 (2)	23 (2)	0.528

CPB, Cardiopulmonary bypass; RBC,: Red blood cells; SD, standard deviation.

mean valve size 23±2mm and the majority biological prosthesis (91.5%).

Early postoperative outcomes

Early postoperative outcomes are detailed in Table 4 and 5.

In-hospital mortality did not occur. No significant differences were found in the majority of studied outcomes. ICU requirements were similar between the two groups regarding invasive mechanical ventilation time, inotropic support, morphine infusion and length of stay. Permanent pacemaker implantation occurred in 3 patients (2 of MS group) and postoperative *de novo* AF was detected in 28 (34,1%) patients (13 of MS group). Postoperative

Table 4 **Early postopertative outcomes**

	Total (n=82)	FS (n=41)	MS (n=41)	*p value*
Mechanical ventilation time, hours [median (min;max)]	3 (0;17)	3 (0;17)	3 (0;12)	0.202
Inotropic support [n (%)]	16 (19.5)	5 (12.2)	11 (26.8)	0.095
New onset atrial fibrillation [n (%)]	28 (34.1)	15 (36.6)	13 (31.7)	0.641
Permanent pacemaker implantation [n (%)]	3 (3.7)	1 (2.4)	2 (4.9)	0.999
Postoperative RBC transfusions [n (%)]	18 (22.0)	8 (19.5)	10 (24.4)	0.594
Analgesia requirement [median (min;max)]	49(0;120)	52 (0;120)	46 (0;112)	0.310
Renal failure [n(%)]	1 (1.3)	1 (2.4)	0 (0.0)	0.999
Cerebrovascular events [n(%)]	1 (1.2)	1(2.4)	0 (0.0)	0.999
Wound infection/dehiscence [n(%)]	2 (2.4)	0 (0.0)	2 (4.9)	0.494
Length of stay [median(min;max)] Intensive Care Unit Hospital	 3 (1;12) 6 (4;39)	 3 (1;12) 6 (4;13)	 2 (1;9) 6 (5;39)	 0.701 0.939
In-hospital mortality [n(%)]	0 (0.0)	0 (0.0)	0 (0.0)	-

RBC, Red blood cells.

Table 5 **Logistic regressions for each early postoperative outcome**

	Crude *OR* [95% CI]	*p value*	Adjusted *OR* [95% CI]*	*p value*
CPB time > 100 min	3.900 [1.538 -9.892]	0.004	4.626 [1.682 -12.726]	0.003
Cross-clamp time > 72 min	3.516 [1.394 -8.868]	0.008	4.720 [1.672 -13.327]	0.003
Mechanical ventilation time > 3h	0.674 [0.277-1.637]	0.383	0.600 [0.234-1.541]	0.288
Analgesia requirement >49 mg	0.798 [0.315-2.026]	0.635	1.038 [0.377-2.857]	0.943
Intensive Care Unit stay	0.646 [0.218-1.919]	0.432	0.750 [0.234-2.402]	0.628
Hospital stay > 3 days	0.901 [0.369-2.202]	0.820	1.370 [0.511-3.670]	0.531

Reference class: FS. CPB, Cardiopulmonary bypass
*Adjusted for NYHA class

RBC transfusion requirements were equivalent between the two groups (24.4% in MS group *vs.* 19.5% in FS group; p=0.594). No significant differences were found related to neurologic (stroke, n=1 in FS group) or renal (renal failure, n=1 in FS group) complications. Although non-significant, we observed a trend towards a higher need of inotropic support in the MS group (26.8% *vs.* 12.2%, p=0.095). Two patients in the MS group developed sternal wound related complications during hospital stay: one exhibited superficial sternal wound infection, in which antibiotic treatment was prescribed, with no subsequent complications; another patient developed mediastinitis leading to a re-intervention sternal wound closure.

Late postoperative outcomes

Cumulative survival at 6 years was 86.7% after MS

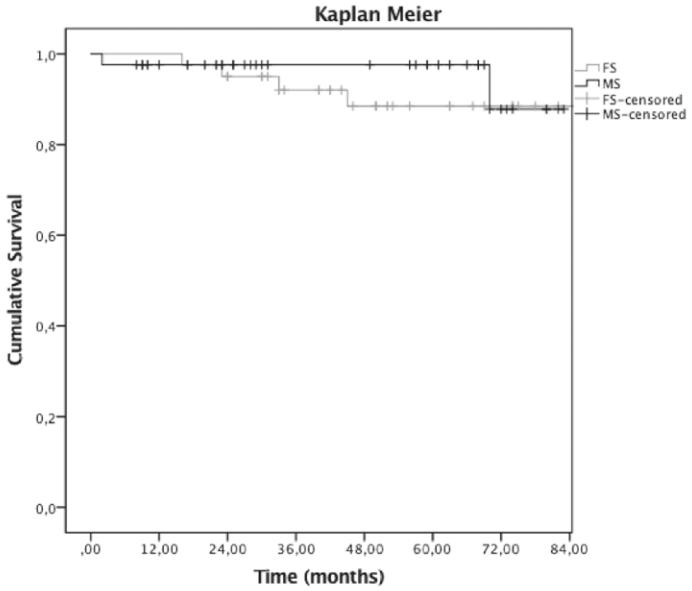

Figure 1 *Cumulative survival (n=82, Log-Rank test, p=0.650).*

and 88.5% after FS (p=0.650), among matched patients (Figure 1).

DISCUSSION

Over the last few decades an increased emphasis on minimally invasive procedures in all surgical fields was observed. Specifically, AVR has undergone a major change in operative technique which included minimal-access incisions, transcatheter/percutaneous procedures and robotics.[2,3] Since the introduction of MS, surgical technique has been improved and refined.[1,3,6]

In this study AVR trough FS or MS overall revealed similar outcomes, both for immediate and mid-term results.

With respect to surgical procedure, MS approach was associated with longer aortic cross-clamping and CPB times which could be related to the technical difficulty imposed by a smaller surgical field with limited cardiac exposure.[11] Similarly, in a meta-analysis of 26 trials, Brown *et al.*[12] also report increased aortic cross-clamping and CPB times with no increased mortality. Nonetheless, we registered a non-significant increase in the need of inotropic support in the MS group. Szwerc *et al.*[13] suggested that this increase was related to the limited exposure of the heart, which could lead to some level of compromise of myocardial protection.[13] Although several concerns regarding the longer ischemic time with MS approach,[1] the absolute difference between techniques may not be clinically significant. Additionally, our study includes initial series of patients with the expectable effect on the learning curve.

A plethora of studies had reported decreased perioperative blood products transfusions with MS approach.[14-16] Although without reaching statistical significant difference, we found a similar tendency in our cohort. This finding is probably related to the smaller mediastinal dissection required to perform the less invasive approach,[17] leading to a better preservation of vessels and consequently, less operative blood loss. On the other hand, postoperative RBC requirements were identical between groups corroborating with Shehada *et al.* series.[18] However, the literature suggests that performing a less-invasive incision is also associated with decreased postoperative bleeding and consequently transfusion requirement.[14-17,19] In our cohort the smaller incision has bigger implications on the maintenance of haemostasis during surgery than postoperatively.

Another potential advantage of MS approach is the reduction of invasive mechanical ventilation time and the improvement of postoperative respiratory function mostly due to a greater preservation of sternum.[3,6] The better stability of the thoracic cage, allowing patients to mobilize earlier and cough more efficiently, is related to reduced respiratory complications.[18,20] We report similar intubation times between groups as was also reported by Khoshbin *et al.*[21] in a meta-analysis with only randomised controlled trials.

Additionally, as less invasive incisions became more popular, there was the expectation that lesser dissection and manipulation with these approaches would lead to a lower risk of *de novo* AF.[4] However, as in our study, several others[12,14,18,19,22] had reported a similar incidence of de novo AF after MS or FS approach. Interestingly, Gilmanov *et al.*[16] reported a 10% absolute risk reduction for this outcome in the MS group but two different types of approaches were analysed together: the MS and the right mini-thoracotomy. The latter has been consistently associated with a reduced incidence of *de novo* AF, possibly

due to the minor pericardial incision and the lack of manipulation of the right atrium, which is not true to either MS or FS.[1] Our data therefore, does not support an association between MS and decreased incidence of *de novo* AF.

Our postoperative analgesia requirements were tendentially smaller within the MS group, likewise Brown *et al.*[12] reports. Evaluation of postoperative analgesia requirements was done through the quantification of milligrams of morphine administered within first 72 hours after surgery. Other methods could have been more accurate considering that pain management is not standardized and other analgesic substances, as non-steroid anti-inflammatories, could have been used instead of morphine. Furthermore, access of postoperative pain with a pain score was not possible considering the retrospective nature of the study and the lack of such registry.

Regarding sternal wound complications, despite sparing sternal bone, MS involves working through a smaller incision leading to potential higher tension applied on the soft tissue, which may explain the two cases of superficial sternal dehiscence registered in the MS group. However, previous meta-analyses report no difference regarding wound complications between MS and FS approaches.[14,23]

ICU and hospital length of stay were similar between groups. In spite of sundry reports of shorter hospitalization in MS patients,[12,15,21,24] we failed to find a significant effect of MS on intensive unit care or hospital stay. We have to consider that despite several standardized protocols used in the ICU, time to perform extubation and length of postoperative stay is ultimately the decision of the attending anaesthesiologist and the cardiothoracic surgeon.

Consistent with prior studies,[12,14] operative mortality and mid-term mortality were not influenced by the surgical approach applied.

We can conclude that MS is a safe alternative to the gold standard FS that does not compromise efficacy of AVR despite significantly longer procedure times. MS can be performed effectively without increased risk of major complication or death.

STUDY LIMITATIONS

There are several limitations in our study: 1) Retrospective, single-centre experience limiting external validity. We attempted to limit the inherent selection bias of a retrospective study by using a coarsened exact matching, but such methods remain inferior to large randomized trials and do not balance to unmeasured variables and confounders. 2) Relatively small sample size limits the power of statistical tests to compare both groups, raising type II error possibility. 3) Missing data of some variables studied. 4) Our analysis lacked assessment on postoperative quality of life, patient satisfaction and it would be interesting to compare mean time to return to active life in MS and FS patients.

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CORREÇÃO DE COARTAÇÃO DA AORTA E SUBSTITUIÇÃO VALVULAR AÓRTICA MINIMAMENTE INVASIVAS SEM ESTERNOTOMIA

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Resumo

A coartação aórtica e a bicuspidia aórtica coexistem frequentemente. A sua correção obriga frequentemente a uma intervenção agressiva e invasiva. Apresentamos um caso de uma intervenção faseada minimamente invasiva sem esternotomia para corrigir a coartação da aorta e substituir a válvula aórtica bicúspide nativa. Este caso ilustra o potencial de procedimentos minimamente invasivos com trauma mínimo e recuperação rápida. Além disso, facilita futuras intervenções cardíacas, como a substituição da prótese biológica e/ou da aorta ascendente, que se antecipam neste doente.

Abstract

Minimally invasive aortic coarctation correction and aortic valve replacement without syetnotomy

Aortic coarctation and bicuspid aortic valve frequently coexist. Correction frequently require an aggressive, invasive approach. Here we present a case of a two-stage minimally invasive intervention without sternotomy to correct aortic coarctation and replace the native bicuspid aortic valve. This case illustrates the potential of minimally invasive procedures with minimal trauma and fast recovery. Besides, it facilitates future cardiac interventions, such as anticipated surgical prosthesis and/or ascending aorta replacement.

INTRODUCTION

Bicuspid aortic valve is the most common congenital cardiovascular anomaly, occurring in 1–2% of the population. It has a male predominance and frequently appears in several members of the same family, suggesting an autosomal dominant inheritance, possibly with variable penetrance.[1,2] Aortic valve stenosis is the most common complication of aortic bicuspid valve and the most frequent cause for aortic valve replacement in patients under 60 years of age. Other complications include aortic regurgitation and infective endocarditis. The association of bicuspid aortic valve with aortic medial abnormalities has been well established. The presence of a bicuspid valve increases the risk of dissection at least nine-fold.[3] In addition, patients with a bicuspid valve presenting with a dissection tend to be younger than those with a tricuspid aortic valve.[4] Patients with a bicuspid valve show variable progression of aortic root dilatation, not solely related to age or hypertension. As a result, there is considerable heterogeneity in aortic dimensions among patients with a bicuspid aortic valve, possibly including a subgroup of patients with a dilated aorta. Both dissection and rupture have been reported from these patients.

Below, we present a case of young male with a bicuspid aortic valve, aortic coarctation and mild ascending aorta dilatation who was treated by minimally invasive interventions, in order to facilitate fast recovery and prepare a future intervention.

CASE REPORT

A 38-year-old male patient presented with symptoms of heart failure. Transthoracic echocardiography (TTE) and contrast enhanced computed tomography (CT) revealed severe ductal aortic coarctation with a minimum diameter of 3 mm and a bicuspid aortic valve (Sievers type I) with severe regurgitation, associated with a dilated left ventricle (234 mL). The maximum diameter of the mid-portion of the ascending aorta was 42 mm with normal dimensions of the aortic arch.

Medical history was non-relevant. Being a professional rescuer, the patient preferred a minimally invasive approach with a biological aortic prosthesis, avoiding warfarin. Therefore a percutaneous correction of the aortic coarctation was performed, followed by aortic valve replacement two months thereafter. There was no indication for ascending aorta replacement, according to the European Society of Cardiology 2014 Aortic Diseases Guidelines.

The first procedure was performed by right femoral arterial approach, involving the implantation of a 45 mm Covered CP Stent® (NuMED Inc®,NY, EUA). The procedure was straightforward and the patient was discharged home the day after the implantation.

Two months later, the patient was re-admitted for elective aortic valve replacement. Surgical approach was via a 5 cm right anterior minithoracotomy in the second intercostal space. Cardiopulmonary bypass was established with mild hypothermia through central aortic and percutaneous right femoral vein cannulation with transoesophageal echocardiographic (TOE) guidance. The heart was arrested using intermittent cold antegrade blood cardioplegia delivered directly in the coronary ostia. Venting was performed through right superior pulmonary vein. The operative setup is demonstrated in Figure 1. An oblique aortotomy was performed and the native aortic valve, which was found to be bicuspid, was excised. The valve was sized in a standard fashion. A 25 mm Trifecta® valve with Glide Technology® (St Jude/Abbott®, MN, USA) was implanted using 15 pledgeted sutures on the ventricular side. The aortotomy was then closed with 4.0 prolene continuous sutures. A bipolar temporary pacemaker catheter (SJM® Pacel®, St Jude/Abbott®, MN, USA) was inserted through the right internal jugular vein into the right ventricle with TOE guidance. The pericardium and the right pleural space were drained. Intraoperative TOE is shown in Figure 2a.

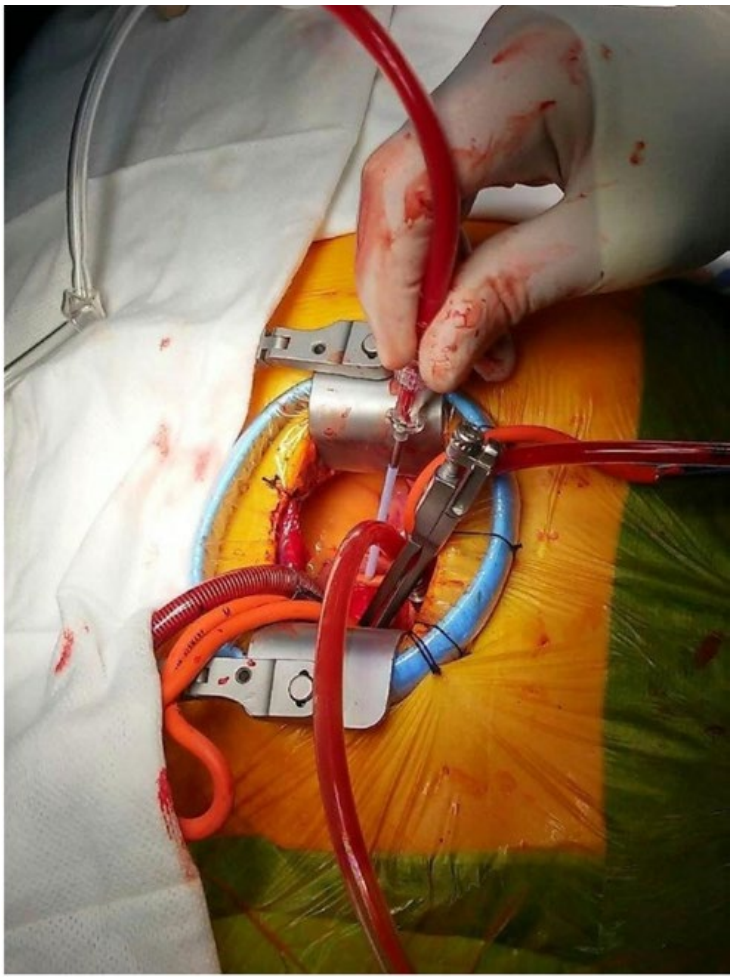

Figure 1 *Operative setup for minimally invasive aortic valve replacement*

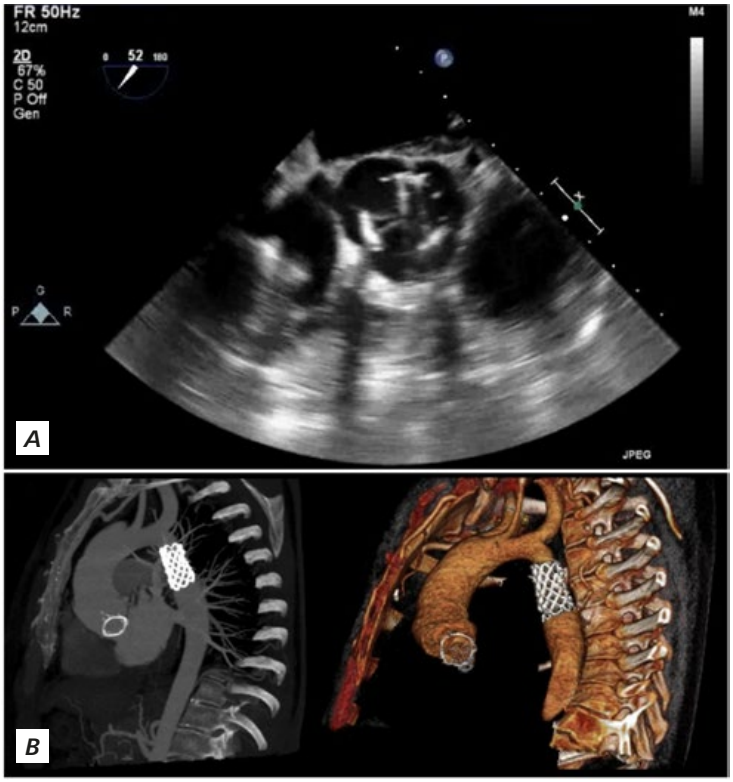

Figure 2 *Intraoperative echocardiographic result of the prosthesis (A) and final angio-CT result of both procedures (B)*

Post-operative hospital stay was uncomplicated. TTE on post-operative day three showed a well-seated valve with no paravalvular leak. The peak gradient across the prosthetic valve was 15 mmHg with a mean gradient of 8 mmHg.

The patient was discharged home on post-operative day 4.

COMMENT

This case illustrates the advantages of minimally invasive interventions, not only in the elderly, but also in young patients, allowing complex procedures with excellent results and patient satisfaction. The implanted aortic prosthesis presents excellent haemodynamics and long-term durability.[5] It is also easy to explant, which is of a great importance in view of the anticipated surgical aortic prosthetic replacement required in future for this patient. This approach to aortic valve replacement will facilitate subsequent procedures given that the minimal pericardiotomy and mediastinal structures dissection. The 3D angio-CT image illustrates the end result (Figure 2b).

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RESSECÇÃO MINIMAMENTE INVASIVA DE MASSAS CARDÍACAS, APÓS RADIOTERAPIA TORÁCICA: UMA ABORDAGEM SEGURA?

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Resumo

A cirurgia cardíaca minimamente invasiva por mini-toracotomia direita para ressecção de massas cardíacas surgiu como alternativa à esternotomia mediana convencional, por se encontrar associada a menos complicações no pós-operatório e a uma recuperação mais rápida. A radioterapia torácica, muito utilizada como adjuvante no tratamento do cancro da mama, pode resultar em adesões pulmonares que tornam difícil o acesso ao coração por toracotomia. Reportamos o caso clínico de uma doente submetida a radioterapia torácica bilateral, com posterior diagnóstico de uma massa na aurícula esquerda, submetida a ressecção cirúrgica, assim como o procedimento realizado para tornar a abordagem minimamente invasiva possível.

Abstract

Minimal invasive cardiac mass resection, post-thoracic radiotherapy: a safe approach?

Minimal invasive cardiac surgery by right mini-thoracotomy for cardiac mass resection has emerged as an alternative to median sternotomy, for being less associated to postoperative complications and a faster recovery. Thoracic radiotherapy, widely used for cancer treatment, can result in pulmonary adhesions making it impossible to access the heart by thoracotomy. We report a case of a patient submitted to bilateral thoracic radiotherapy, with a cardiac mass in the left atrium, successfully treated by surgical resection, as well the intraoperative procedure done to make the minimally invasive approach possible.

INTRODUCTION

Minimal invasive cardiac surgery by right mini-thoracotomy (MICS-RMT) for cardiac mass resection has emerged as an alternative to median sternotomy, for being less associated to postoperative complications and a faster recovery.[1]

Thoracic radiotherapy used in the treatment of cancer, such as breast cancer, causes lung and pleural damage that can result in pulmonary adhesions.[2] Complementary diagnostic tests are unable to determine if the lung may be excluded and to determine candidates to MICS-RMT.

To avoid intraoperative sternotomy conversion, some patients with previous thoracic radiotherapy are directly submitted to conventional sternotomy, due to the risk of finding dense pulmonary adhesions that impede access to the heart by MICS-RMT.

We report a case of a patient with previous bilateral thoracic radiotherapy due to breast cancer, with diagnosis of a cardiac mass in the left atrium, submitted successfully to its removal by MICS-RMT.

CASE REPORT

A 69-year-old woman, with past of bilateral breast cancer treated with surgery and radiotherapy in 2006 and 2012, presented to our outpatient clinic.

She underwent an elective upper gastrointestinal endoscopy that revealed a lesion in the gastric antrum. For better characterization, she was submitted to an endosonography that showed a benign lipoma in the gastric antrum. Concurrent mediastinal examination found a mass

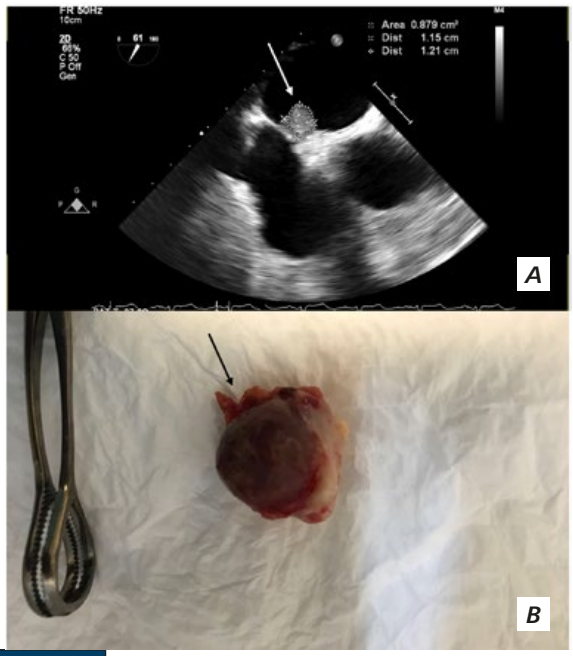

Figure 1 *(A) Preoperative transesophageal echocardiogram showing the mass in the left atrium (white narrow). (B) Macroscopic view of the mass resected (black narrow).*

of 11 mm in the left atrium, later confirmed by transesophageal echocardiogram (Fig. 1A).

Cardiac metastases are the most common heart tumors.[3] Breast cancer is one of the main tumours with cardiac metastization, although it usually presents with pericardial involvement.[4] Myxomas are the most common primary tumors, with 85% localized to the left atrium.[5] Due to the patient's oncologic history and mass characteristic, both were considered as possible diagnoses.

Mass resection was planned by right mini-thoracotomy, but due to a history of radiotherapy the patient had an increased risk of pulmonary adhesions. To evaluate surgical access to the heart by this approach, a small incision of 1cm was made at the right 4th intercostal space, in mid axillar line and digital exploration was performed to evaluate adhesions, which were not confirmed. A 30º 10 mm optic was introduced and collapse of the right lung was obtained with selective ventilation. Thus, the mini-thoracotomy was extented with about 5 cm and the soft tissue was introduced in the incision to allow better visualization (Fig. 2).

After put the patient in bypass by femoral cannulation the heart was exposed and the aorta clamped. After the left atrium was opened, immediate mass visualization allowed quick and complete resection (Fig. 1B). The echocardiogram showed complete mass resection. The operation had a duration of 94 minutes, with 35 minutes of cardiopulmonary bypass and 15 minutes of aortic cross-clamping.

The patient was admitted in the ICU and extubated 4 hours later. She was discharged home on the 5th postoperative day, without any intercurrence. At the 1-month follow-up visit, the patient was clinically well.

Histology of the mass showed it to be a cardiac mixoma.

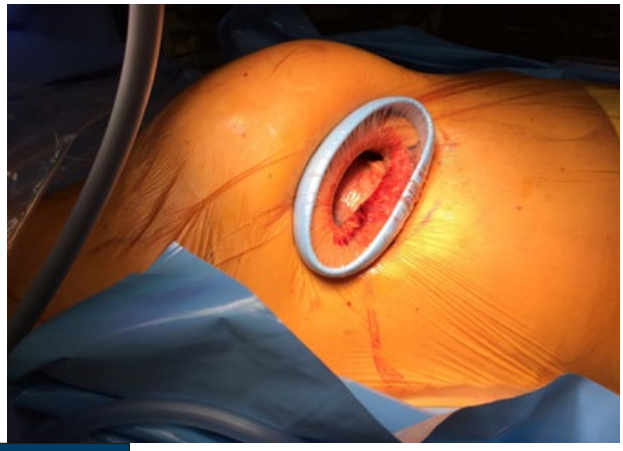

Figure 2 *Surgical incision for resection of the cardiac mass.*

CONCLUSION

The right mini-thoracotomy surgical approach avoids sternotomy with faster recovery and less trauma.

In patients with risk factors for pulmonary adhesions it is possible to check the feasibility of this technique by using a small incision in right 4th intercostal space, complied with manual exploration of pleural cavity and use of the thorascope.

A small incision to test for the presence of pleural adhesions may allow that patients who were automatically excluded from minimal invasive approach are submitted to it, and we think that it may be applied to all high risk patients, in whom minimal invasive surgery is the best option.

In this clinical case, due to the increased risk of adhesions and possible pulmonary collapse, this technique was used and the patient safely benefited from this approach.

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RESULTADOS CLÍNICOS APÓS UTILIZAÇÃO DE ANGIOGRAFIA DE SUBTRAÇÃO DIGITAL VERSUS ANGIOTOMOGRAFIA COMPUTORIZADA NA AVALIAÇÃO PRÉ-OPERATÓRIA DA DOENÇA ARTERIAL PERIFÉRICA.

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Resumo

Introdução: A Angiografia de Subtração Digital (ASD) era considerada o gold-standard para avaliação da Doença Arterial Periférica (DAP). O desenvolvimento da angiotomografia computadorizada (ATC) melhorou a sensibilidade e especificidade deste método. O objetivo principal deste trabalho é caraterizar uma coorte de doentes com DAP dos membros inferiores e perceber se há diferenças clínicas entre os doentes avaliados pré-operatoriamente por ASD ou ATC.

Métodos: Este estudo retrospetivo incidiu sobre doentes com DAP submetidos a intervenção cirúrgica (revascularização endovascular ou cirurgia aberta). No grupo ATC foram incluídos todos os doentes que realizaram ATC como exame de avaliação pré-operatória, entre março de 2009 e abril de 2017. O grupo ASD incluiu doentes submetidos a ADS como exame pré-operatório durante o mesmo período. Os grupos foram comparados quanto a detalhes da intervenção, alteração do índice tornozelo-braço (ITB) com a intervenção, taxas de reintervenção, de amputação major e de mortalidade, bem como tempo de internamento.

Resultados: Foram incluídos 102 doentes (33 ATC e 69 ASD). O grupo ASD apresentou mais lesões no setor distal com classificação TASC C ou D (p=0.002) e maior escassez de vasos de *runoff* (p=0.001). Não se registaram diferenças no rácio intervenção endovascular/cirurgia aberta (p=0.308), na alteração do ITB com a intervenção (p=0.860), nas taxas de reintervenção (p=0.236), de amputação major (p=0.999) ou de mortalidade (p=0.574), nem no tempo de internamento (p=0.933).

Conclusão: Os resultados deste trabalho sugerem que a ATC possa ter um desempenho semelhante à ASD no estudo morfológico e planeamento terapêutico da DAP. Contudo, estes resultados não podem ser extrapolados para os doentes com lesões graves do setor distal.

Abstract

Clinical outcomes after digital subtraction angiography versus computed tomography angiography in the preoperative evaluation of lower limb peripheral artery disease.

Introduction: *Digital subtraction angiography (DSA) was considered the gold standard method for peripheral artery disease (PAD) evaluation. Notwithstanding, recent developments of computed tomography angiography (CTA) have improved the specificity and sensibility of this method.*

The main objective of this study is to characterize a cohort of patients with lower limb PAD and clarify if there are

differences upon groups using different preoperative imaging methods (DSA or CTA).

Methods: *This retrospective study focused on patients with PAD that underwent surgical intervention (endovascular revascularization or open surgery). CTA group included all patients submitted to this method as their pre-operative exam, between March 2009 and April 2017. DSA group included patients submitted to DSA as their pre-operative exam within the same period. The groups were compared regarding intervention details, ankle-brachial index (ABI) variation, reintervention, major amputation and mortality rates, and hospital length of stay.*

Results: *One hundred and two patients were included (33 CTA and 69 DSA). DSA group presented more below the knee lesions with TASC C or D classification (p=0.002), as well as runoff vessels scarcity (p=0.001). There were no differences in the endovascular/open surgery ratio (p=0.308), ABI alteration with intervention (p=0.860), reintervention rates (p=0.236), major amputation (p=0.999), mortality (p=0.574), or hospital length of stay (p=0.933).*

Conclusion: *CTA seems to achieve equivalent performance to DSA for morphological and therapeutic planning of PAD. Nevertheless, extrapolation to patients with TASC C or D distal lesions cannot be performed.*

INTRODUCTION

Peripheral artery disease (PAD) is a common cardiovascular pathology, affecting around 202 million people in the world.[1] Lower limb PAD, the focus of this study, affects approximately 8.5 million Americans with 40 years or more. Its high prevalence and significant associated morbidity, mortality and changes in quality of life,[1] show the importance of selecting the most suitable diagnostic method. In Portugal, PAD prevalence is estimated in 5.9%.[2]

Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II) gives an anatomic classification of PAD,[3] providing help in the guidance of the therapeutic decision process. There are classifications for aortoiliac, femoral-popliteal regions and, since 2009, for infrapopliteal region. TASC A lesion is the less complex scenario, representing the most suitable situation for an endovascular approach. TASC D is the most complex scenario, being more frequently associated with a surgical approach.[4]

PAD's initial diagnosis is achieved through clinical history and physical examination. Posterior evaluation can be done by a Doppler ultrasound, Computed Tomography Angiography (CTA), Magnetic Resonance Angiography or Digital Subtraction Angiography (DSA).

It remains controversial which of the imagological methods is more appropriate, both clinically and economically. Each one of them has its advantages and disadvantages.[5] CTA advantages are: high specificity and sensibility, being a fast procedure, allows evaluation of calcified vessels (important for planning endovascular interventions), being a non-invasive and ambulatory method and its increasingly accuracy and possibility of indirect evaluation of peripheral collateral circulation (visualization of the vessels' opacification distally to the arterial occlusions). CTA disadvantages are suboptimal evaluation of heavily calcified arteries (less accurate classification of stenosis and a suboptimal evaluation of more distal vessels, because of their reduced diameter).

DSA disadvantages are: being an invasive method with associated risks and limitations and being a more time-consuming method. DSA advantages are: a clear representation of lumen (evaluation of the lumen is easier in cases of heavily calcified arteries) and the visualization of collaterals per se, mostly the thinnest, and blood flow dynamics leading to distal reformation of vessels.[6]

Objectives: The main goal of this work is to characterize a cohort of lower limb PAD patients and to clarify if the preoperative requested exam (CTA or DSA) has some kind of influence in short and long term clinical outcomes. The primary outcomes were reintervention rate, major amputation rate and mortality; secondary outcomes were intervention details (ratio of endovascular versus open surgery, failed procedures, intervened sectors and number of revascularized sectors), ankle-brachial index (ABI) variation and hospital length of stay.

MATERIAL AND METHODS

This retrospective cohort study took place in the Department of Angiology and Vascular Surgery from Centro Hospitalar de São João (CHSJ). Ethical approval was requested and given by the Ethics Committee of CHSJ.

Analyzed groups were patients with lower limb PAD with Rutherford classification ≥ 3 submitted to surgical intervention (endovascular revascularization or open surgery). The CTA group (n=33) included all patients submitted to this method as their preoperative exam, between March 2009 and April 2017. DSA group (n=69) consisted of the first 69 patients submitted to DSA, that had images available for analysis, starting on March 2009. The patients were selected through the hospital digital database, available for patients subjected to lower limb CTA and DSA.

The exclusion criteria were realization of the exam for a different diagnosis than PAD, amputation not preceded by revascularization, absence of intervention during a period of 1 year after the exam.

Clinical and demographic characterization of patients (Table 1) was achieved by collecting for each patient (when available), the following variables: sex, age, smoking history (categorized as current, previous, or never), diabetes (defined as a fasting plasma glucose ≥126mg/dL or hypoglycemic treatment), hypertension (defined as systolic blood pressure ≥140mm Hg, diastolic blood pressure ≥90mm Hg, or antihypertensive therapy), carotid disease (defined as

Table 1 **Cohort demographic and clinical characteristics**

Variable*		DSA (n=69)	CTA (n=33)	*Total (n=102)*	*p*-value
Sex	Male	76%	94%	82%	0.029
Age (years)		67 ±11	68±11	67±11	0.754
Diabetes	No	54%	34%	48%	0.107
	Diet or oral medication controlled	20%	28%	22%	
	Adult: Insulin dependent	25%	34%	28%	
	Juvenile: Insulin dependent	2%	3%	2%	
Hypertension	no	12%	15%	13%	0.831
	Regulated by monotherapy	30%	26%	29%	
	Regulated by 2 drugs	28%	33%	30%	
	Regulated by >2 drugs	30%	26%	29%	
Smoking history	None	39%	7%	29%	0.042
	Previous smoker	31%	59%	40%	
	Current smoker	31%	34%	32%	
BMI (kg/m2)		27±4	24±2	26±4	0.032
Carotid disease	no	72%	76%	73%	0.808
	Asymptomatic significant stenosis	2%	0%	1%	
	TIA	3%	0%	2%	
	Ischemic stroke	23%	24%	23%	
Coronary disease	None	82%	72%	79%	0.316
	Stable Angina	3%	4%	4%	
	Unstable Angina	2%	0%	1%	
	MI > 1 year	12%	24%	15%	
	MI <1 year	2%	0%	1%	
Coronary treatment	No	90%	87%	89%	0.790
	PCI	3%	10%	6%	
	CABG	3%	3%	3%	
	PCI and CABG	3%	0%	2%	
Congestive Heart Failure		8%	8%	8%	0.604
CKD	No	73%	58%	68%	0.039
	Mild increased serum creatinine (<210μmol/L)	17%	15%	16%	
	Severe increased serum creatinine (220-250μmol/L)	2%	3%	2%	
	Serum creatinine >250μmol/L or dialysis/kidney transplantation)	9%	24%	14%	
Anticoagulation		17%	13%	16%	0.416
Antiplatelet		64%	75%	68%	0.280
Vasodilators		3%	3%	3%	0.738
ACE inhibitor or ARB		64%	58%	62%	0.596
Diuretics		49%	45%	48%	0.719
CCB		26%	13%	21%	0.155
BB		31%	26%	29%	0.605
Statins		60%	61%	60%	0.881

* Categorical variables are presented as %. Continuous variables are presented as mean ± standard deviation. p-value for differences between DSA and CTA.
DSA, digital subtraction angiography; CTA, computed tomography angiography; MI, myocardial infarction; ACE inhibitor, angiotensin-converting-enzyme inhibitor; ARB, angiotensin receptor blockers; CCB, Calcium channel blocker; BB, Beta blocker; CABG, coronary artery bypass graft; CKD, chronic kidney disease; PCI, percutaneous coronary intervention; BMI, body mass index.

either absent, any asymptomatic stenosis, history of transient ischemic attack, history of ischemic stroke or previous carotid intervention), coronary disease (defined as either absent or stable angina, unstable angina or myocardial infarction), previous coronary treatment (previous endovascular and/or open coronary revascularization), chronic kidney disease (CKD - defined as absent, mild if plasma creatinine <2.10mmol/L, severe if creatinine 2.20-2.50mmol/L or terminal if creatinine >2.50mmol/L or dialysis or kidney transplant), body mass index (BMI - defined as the weight in kilograms divided by height in meters squared), congestive heart failure (based on clinical and echocardiogram findings) and regular medication (anticoagulation, antiplatelet, vasodilators, angiotensin-converting-enzyme inhibitor (ACE inhibitor), angiotensin receptor blockers, calcium channel blocker (CCB), beta blocker (BB), diuretics, statins).

PAD characterization (Table 2) was done by collecting these variables: symptomatic limb, Rutherford classification,[7] previous arterial surgery, TASC classification for aortoiliac, femoral-popliteal and infrapopliteal regions and number of run-off vessels. All this data was obtained using the CHSJ digital clinical record system.

Finally, we searched for statistically significant differences between the groups, in what concerns to the outcomes mentioned above using IBM SPSS® Statistics version 24. Continuous variables were expressed as mean ± standard deviation (SD) when normally distributed and as median and interquartile range (IQR) when skewed. Categorical variables were expressed as percentages. Kaplan-Meier curves were used to express time-dependent variables. For binary outcomes, Chi-square or Fisher's test were used to compare the two groups. For continuous outcomes, a non-parametric Mann Whitney U test was used. For time-dependent variables, Log-Rank tests were used to compare the two groups.

RESULTS

Clinical, demographic and PAD characteristics of patients included in this analysis are reported in tables

Table 2 **PAD characterization**

Variable*		DSA (n=69)	CTA (n=33)	*Total (n=102)*	*p*-value
Rutherford Classification	3	15%	18%	16%	0.749
	4	33%	24%	30%	
	5	33%	36%	34%	
	6	18%	21%	19%	
Previous arterial surgery		24%	42%	30%	0.057
Aortoiliac lesions (TASC classification)	Without disease	57%	36%	50%	0.121
	A	6%	11%	8%	
	B	8%	11%	9%	
	C	5%	11%	7%	
	D	24%	32%	26%	
Femoral-popliteal lesions (TASC classification)	Without disease	12%	11%	11%	0.749
	A	3%	0%	2%	
	B	28%	18%	25%	
	C	30%	54%	37%	
	D	28%	18%	25%	
Infrapopliteal lesions (TASC classification)	Without disease	54%	86%	64%	0.002
	A	8%	7%	8%	
	B	12%	7%	10%	
	C	20%	0%	14%	
	D	5%	0%	3%	
Number of run-off vessels	0	2%	0%	1%	0.001
	1	70%	36%	59%	
	2	27%	57%	36%	
	3	2%	7%	3%	

* Categorical variables are presented as %. p-value for differences between DSA and CTA. DSA, digital subtraction angiography; CTA, computed tomography angiography; TASC classification, Inter-Society Consensus for the Management of Peripheral Arterial Disease classification.

1 and 2. Briefly, 102 patients were included, 69 in DSA group and 33 in CTA group. The groups were homogenous in terms of clinical and demographic characteristics, except for sex (94% male in CTA and 76% in DSA; p= 0.029), smoking history (39% non-smokers in DSA and 7% non-smokers in CTA; p= 0.042), CKD (73% without CKD in DSA and 57% without CKD in CTA; p= 0.039) and BMI (27±4 in DSA and 24±2 in CTA; p=0.032).

In what refers to PAD characteristics, the groups were homogenous, except for infrapopliteal lesions – DSA group showed more frequency of lesions with TASC C or D classification (25% in DSA group and 0% in CTA group; p=0.002), as well as scarcity of runoff vessels (0 or 1 in 72% of DSA patients group and 36% in CTA group; p=0.001).

OUTCOMES

Intervention details

There were no differences between the groups in what refers to the type of surgery - open or endovascular. Endovascular procedure was performed in 64% of CTA patients and in 53% of DSA patients (p=0.308). 57 of all patients were subjected to an endovascular procedure and 44% to an open surgery.

The frequency of failed procedures was not different between groups. CTA group presents a 3% rate of failed procedure and DSA 9% (p=0.423). Globally, 7% of all procedures represent failed procedures.

Intervened sectors did not present differences between groups. Iliac sector was intervened in 41% of CTA patients and 36% of DSA's (p=0.683). Femoral--popliteal sector was intervened in 63% of CTA patients and 71% of DSA's (p=0.384). Distal sector was intervened in 13% of CTA patients and 14% of DSA's (p=0.575). No differences were found in the number of intervened sectors. 16% of CTA and 21% of DSA patients were intervened in 2 sectors (p=0.512).

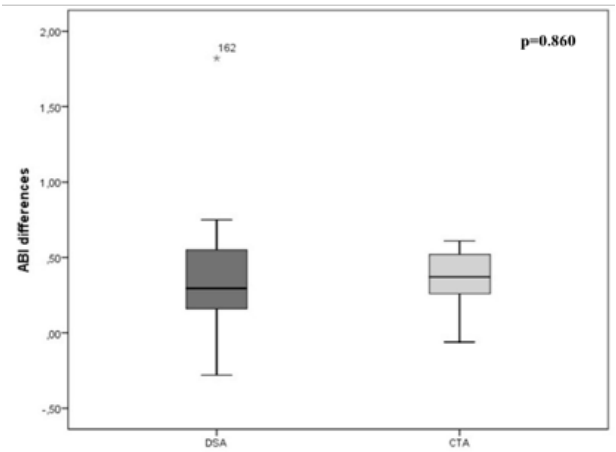


Figure 1 *Analysis of ABI differences (post-surgery ABI – pre-surgery ABI) for DSA (ABI difference=0.37±0.38) vs CTA (ABI difference=0.35±0.19), (mean ± standard deviation). ABI, ankle-brachial index; DSA, digital subtraction angiography; CTA, computed tomography angiography.*

ABI variation with intervention

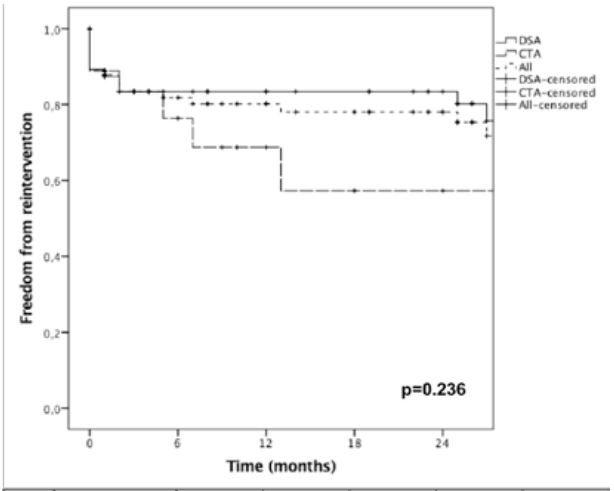
Changes in ABI were no different between groups (Fig. 1). CTA ABI change with intervention was 0.35±0.19 (mean ± standard deviation) and DSA ABI change with intervention was 0.37±0.38 (p=0.860).

Hospital length of stay

Hospital length of stay wasn't different between CTA and DSA groups. DSA median length of stay was 14 days with an interquartile range of 171 days. Maximum value was 172 days and minimum was 1 day. CTA median length of stay was 13,5 days with an interquartile range of 65 days. Maximum value was 67 days and minimum was 2 days (p=0.933). Globally, patients' median length of stay was 14 days with an interquartile range of 171 days. Maximum value was 172 days and minimum was 1 day.

Reintervention

For the whole cohort, freedom from reintervention at 30 days, 6 months and 12 months were 88%, 82% and 80%, respectively. There were no differences in freedom from reintervention rates at 30 days between groups (89% for CTA and 87% for DSA). At 6 months, freedom from reintervention was 76% for CTA and 83% for DSA (p=0.236; Fig. 2).

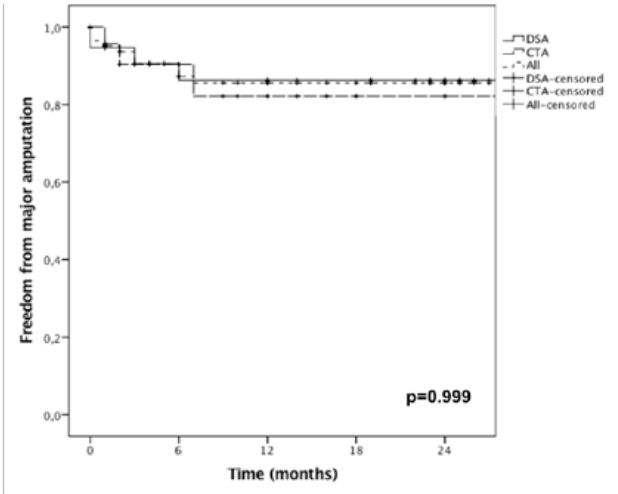


	Time after intervention, months	1	6	12	18	24
DSA	Estimate (SE), % NAT, n	87 (4) 47	87 (4) 39	87 (4) 36	87 (4) 31	87 (4) 27
CTA	Estimate (SE), % NAT, n	89 (6) 20	76 (10) 11	69 (11) 7	57 (14) 5	57 (14) 4
All	Estimate (SE), % NAT, n	88 (4) 67	82 (4) 50	80 (5) 43	78 (5) 36	78 (5) 31

Figure 2 *Kaplan-Meier graphic for reintervention. DSA, digital subtraction angiography; CTA, computed tomography angiography; SE, standard error; NAT, number at risk.*

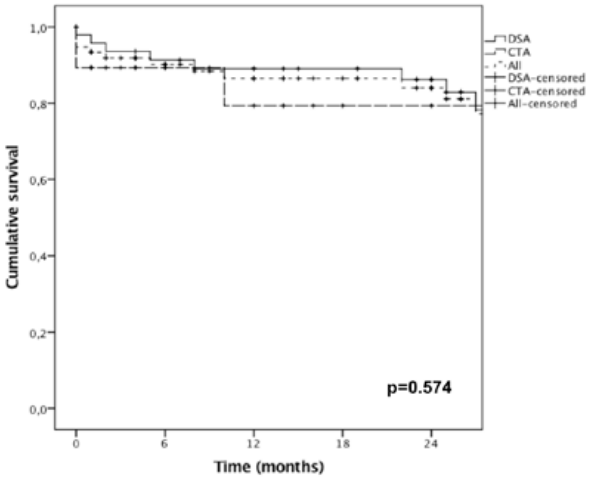
Major amputation

For the whole cohort, freedom from major amputation at 30 days, 6 months and 12 months were 95%, 87% and 86%, respectively.



	Time after intervention (months)	1	6	12	18	24
DSA	Estimate (SE), % NAT, n	95 (3) 49	86 (5) 42	86 (5) 40	86 (5) 36	86 (5) 31
CTA	Estimate (SE), % NAT, n	96 (4) 23	90 (7) 13	82 (10) 8	82 (10) 5	82 (10) 4
All	Estimate (SE), % NAT, n	95 (2) 72	87 (4) 55	86 (4) 48	86 (4) 41	86 (4) 35

Figure 3 *Kaplan-Meier graphic for major amputation. DSA, digital subtraction angiography; CTA, computed tomography angiography; SE, standard error; NAT, number at risk.*



	Time after intervention (months)	1	6	12	18	24
DSA	Estimate (SE), % NAT, n	96 (3) 45	91 (4) 41	89 (5) 38	89 (5) 33	86 (5) 28
CTA	Estimate (SE), % NAT, n	89 (6) 23	79 (11) 13	79 (11) 8	79 (11) 5	79 (11) 4
All	Estimate (SE), % NAT, n	93 (3) 68	90 (4) 54	86 (4) 46	86 (4) 38	84 (5) 32

Figure 4 *KKaplan-Meier graphic for mortality. DSA, digital subtraction angiography; CTA, computed tomography angiography; SE, standard error; NAT, number at risk.*

There were no differences in freedom from major amputation rates at 30 days between groups (96% for CTA and 95% for DSA). At 6 and 12 months, freedom from major amputation was 90% and 82% for CTA and 86% and 86% for DSA (p=0.999) (Fig. 3).

Mortality

For the whole cohort, survival at 30 days, 6 months and 12 months were 93%, 90% and 86%, respectively. There were no differences in survival rates at 30 days between groups (89% for CTA and 96% for DSA). At 6 months, freedom from mortality was 89% for CTA and 91% for DSA (p=0.574) (Fig. 4).

Sensitivity analysis

Since our patients with TASC C or D classification for infrapopliteal lesions were always subjected to DSA instead of CTA (25.4% in DSA group and 0% in CTA group), a sensitivity analysis was performed excluding these patients.

The groups remained heterogeneous for sex (94% male in CTA and 73% in DSA; p= 0.016) and BMI (27.3±4.2 in DSA and 23.7±2.3 in CTA; p=0.035), but smoking history (35% non-smokers in DSA and 7% non-smokers in CTA; p= 0.097) and CKD (69% without CKD in DSA and 58% without CKD in CTA; p= 0.118) didn't present differences between the groups in this analysis.

Number of run-off vessels remained different between the groups (1 run-off vessel in 64% of DSA patients group and 36% in CTA group; p= 0.016).

Outcomes remained with no differences between the groups in this analysis.

DISCUSSION

The main finding of this study is that CTA seems to present an acceptable performance in clinical outcomes compared to DSA in the study of morphology and therapeutic planning of at least some PAD patients, that is, those without severe infrapopliteal lesions. Non withstanding, the main finding of this paper cannot be extrapolated for below the knee lesions that were TASC C and D since all patients in this subgroup performed DSA.

We compared our PAD series' results with other international studies. Comparing our results with the ones related by Vascular Quality Initiative (VQI)[8] and UK NATIONAL VASCULAR REGISTRY (2016 Annual Report),[9] this series of PAD presented:

(a) Closer percentage of open vs endovascular procedures (43% and 57%, respectively vs 31% and 67%, respectively, in VQI).
(b) Higher hospital length of stay - 2016 Annual Report presents a hospital length of stay of 1 day (interquartile range of 0-7 days) for endovascular procedures and 8 days (interquartile range of 4-16 days) for open procedure (vs 14 days - interquartile range of 1-172 days, in our study).
(c) Higher reintervention rates - 2016 Annual Report states reintervention rates of 3.2% for endovascular procedures and 4.1% for open surgery at two years. Because these values were collected during two years and our patients' reintervention data were collected in a period of time superior to 5 years, we cannot directly compare these values.

(d) Higher amputation rates - 2016 Annual Report relates a 3% rate of amputation at any level for endovascular procedures and 3.8% for open procedures during a two--year period. Once again, because there are divergences in the period of time of data collection (two years vs more than four years), these values cannot be directly compared, nevertheless they are the ones available.
(e) Similar survival at 1 year - 86% in our series vs 77-96% in endovascular procedure for critical limb ischemia (CLI) or 95-100% in bypass for claudication group, in VQI.

Several studies point for a crescent utilization of CTA instead of DSA in PAD evaluation, showing equality or, in some works, diagnostic and therapeutic performance superiority of CTA over DSA.[6,10-12]

Met R, *et al*[11] shows that CTA is a valuable exam to distinguish PAD extension in patients with, predominantly, intermittent claudication (IC) and that there are few works doing this analysis for CLI.[13] The authors highlighted that the methodological weakness of the analyzed studies didn't allow them to take definitive conclusions.

Napoli A, *et al*[12] compared diagnostic performance and effect on PAD therapeutic decision when recurring to 64-slice CTA or DSA for disease evaluation. It was shown that 64-slice CTA diagnostic performance is excellent in patients with symptomatic PAD and therapeutic decision can be made using this method, as CTA based therapeutic recommendations were identical to DSA in all patients, except one.

Duan Y, *et al*[10] concluded that PAD diagnosis by low-dose CTA is a reliable choice, being shortly executed and available, when compared to DSA. This work reinforces low-dose CTA viability of utilization, remembering its advantages: reduced radiation exposure and improvement in image quality and diagnostic performance (sensibility – 100%; specificity – 93.5%; positive predictive value – 100%; negative predictive value – 96.05%).

Mishra A, *et al*6 demonstrated that 256-slice CTA presents one of the highest values of sensibility, specificity and precision, reported so far in literature, for PAD severity evaluation. In most cases, 256-slice CTA offers enough diagnostic information to decide whether a patient needs conservative treatment or endovascular/ open intervention. DSA would be only used in a few selected cases or when an endovascular procedure is being considered.

Our results, obtained from a real world sample of patients, seem to be in line with the recent guidelines recommendations, where CTA is suggested as an excellent option for the study of morphology and therapeutic planning of PAD, except for the distal sector, where DSA remains an indispensable evaluation tool.[1]

Some limitations to our work can be enumerated. First, it is a retrospective cohort study with its inherent limitations.[14] Second, the presence of a small number of patients with severe below the knee PAD assessed by CTA (selection bias). Finally, the relatively small sample size and the low number of primary outcome events that prevented further study of confounders using multivariate analysis. Being aware of this limitations lead us to perform a sensitivity analysis excluding patients with severe below the knee PAD and, by doing this, CTA and DSA groups became more homogenous (and with less selection bias), despite remaining differences for sex (more male patients were subjected to CTA) and number of run-off vessels (DSA remained the preferred method when there is only one run-off vessel).

CONCLUSION

Evidence from this real-word study suggests that CTA seems to present acceptable performance in clinical outcomes compared to DSA in the study of PAD, although caution should be taken for below the knee lesions that are TASC C and D. In this group of patients, DSA has been the preferential chosen method for PAD evaluation, preventing a retrospective comparison versus CTA.

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DOENÇA ANEURISMÁTICA – UMA PATOLOGIA MULTIFOCAL A PROPÓSITO DE UM CASO CLÍNICO.

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Resumo

Introdução: Aneurismas para-anastomóticos verdadeiros constituem uma complicação rara da cirurgia arterial.

Objetivo: Este trabalho pretende descrever o caso de um doente de 73 anos, com antecedentes de amputação pela coxa do membro inferior esquerdo por aneurisma poplíteo trombosado, admitido para tratamento cirúrgico de aneurisma poplíteo contralateral.

Resultados: O doente foi submetido a exclusão do mesmo com construção de *bypass* femoro-poplíteo curto infragenicular com veia grande safena. Dois anos após a cirurgia índice, em controlo ecográfico, foi identificada ectasia de ambas as anastomoses com 1,7cm e 1,4cm de diâmetro máximo nas anastomoses proximal e distal, respetivamente. Manteve-se vigilância e aos 12 anos de seguimento apresentava aneurisma para-anastomótico verdadeiro na anastomose proximal com 4,8cm de diâmetro máximo. Foi submetido, então, a ressecção de aneurisma com interposição de enxerto protésico entre artéria nativa e o conduto venoso prévio. A artéria poplítea distal nesta altura apresentava, aproximadamente, 1,8cm de diâmetro, tendo-se optado por manter vigilância. Aos 17 anos de seguimento, a artéria poplítea justa anastomose distal atingiu 3,2cm em angiotomografia computorizada. Foi, portanto, submetido a abordagem poplítea distal e, devido a redundância do conduto venoso prévio provocada por uma dilatação progressiva da artéria poplítea distal, foi possível proceder a aneurismectomia total e reanastomose termino-terminal de conduto venoso à artéria poplítea distal de calibre normal. Aos cerca de 20 meses de seguimento, apresenta-se assintomático, com pulsos distais presentes, sem sinais clínicos ou radiológicos de degenerescência aneurismática.

Discussão e Conclusão: Este trabalho pretende realçar a relevância do seguimento destes doentes, não só em termos clínicos, mas também radiológicos, pois estamos perante uma patologia de carácter difuso que pode surgir em qualquer segmento arterial de forma assintomática.

Abstract

Aneurysmal disease – a multifocal pathology with regard to a clinical case.

Introduction: *True para-anastomotic aneurysms are a rare complication of arterial surgery.*

Objective: *This paper aims to describe the clinical case of a 73 years-old patient, with history of a left above-the-knee amputation due to an occluded popliteal aneurysm, admitted for surgical treatment of a contralateral popliteal aneurysm.*

Results: *A bypass between the right distal superficial femoral artery (SFA) and the distal popliteal artery was performed using autologous vein. Two years after the index surgery, aneurysmatic degeneration of the native artery was found on ultrasound, with 1.7 cm at the proximal anastomosis, and 1.4 cm distally. We kept surveillance, however, 12 years after surgery, he had a proximal true para-anastomotic aneurysm of the SFA with 4.8 cm. So, resection with interposition of a prosthetic graft between the native artery and the venous conduit of the previous bypass was performed. At this time the popliteal artery at the distal anastomosis had, approximately, 1.8 cm, so we chose to remain vigilant. Seventeen years after surgery, it measured 3.2 cm, in computed tomographic angiography. Therefore, total aneurysmectomy was performed and, due to redundancy of the previous bypass venous conduit caused by progressive dilation*

restricted to the distal popliteal artery, we did a termino-terminal reanastomosis to the normal sized popliteal artery. After 20 months, he is asymptomatic, with distal pulses present, without clinical nor radiological signs of aneurysmal degeneration.

Discussion and Conclusion: *This work aims to highlight the relevance of the follow up, not only on a clinical basis but also radiological, since we are dealing with a diffuse pathology that can appear in any arterial segment without symptoms.*

INTRODUÇÃO

Aneurisma é uma palavra de origem grega que significa alargamento ou dilatação, com consequente perda de paralelismo. Os aneurismas arteriais podem surgir em qualquer sector, sendo mais frequentes no aorto-ilíaco, tratando-se duma doença sistémica de etiologia multifatorial. A sua incidência é superior no género masculino.

O risco de rotura correlaciona-se com o tamanho, localização, etiologia, crescimento e morfologia.

Os aneurismas para-anastomóticos são raros e definem-se por englobar a anastomose, podendo ser falsos (mais comuns) ou verdadeiros.[1]

CASO CLÍNICO

Doente de género masculino, 73 anos, com antecedentes de diabetes *mellitus* tipo 2, hipertensão controlada, dislipidémia e hiperuricemia, com história prévia de amputação transfemoral membro inferior esquerdo (MIE) aos 56 anos por trombose aguda de aneurisma poplíteo previamente desconhecido. Foi diagnosticado um aneurisma poplíteo contralateral não complicado com 2,7cm, tendo sido submetido, 2 meses depois, a *bypass* femoro-poplíteo (BFP) curto infragenicular com veia grande safena invertida, homolateral, em trajeto anatómico.

Após 1 ano, foi identificado um aneurisma femoral esquerdo com 3,1cm, tipo 2, tendo-se realizando aneurismectomia parcial com interposição de enxerto de Dacron entre artéria ilíaca externa (AIE) e artéria femoral profunda. O estudo aorto-ilíaco excluiu aneurismas associados neste sector.

Durante vigilância clínica e imagiológica, com ultrassonografia e tomografia computorizada com contraste (AngioTC), constatou-se ectasia para-anastomótica proximal e distal do membro inferior direito (MID), com crescimento ao ritmo registado na Tabela 1.

Entre os 58 e os 66 anos (2 a 10 anos após cirurgia índice) apresentou quadros de erisipela recorrentes com internamentos sucessivos no serviço de Dermatologia, optando-se por manter vigilância, dada deterioração do estado clínico do doente e risco de infeção, apesar das dimensões dos aneurismas.

Aos 10 anos após cirurgia índice, por sinais inflamatórios exuberantes na região inguinal esquerda com febre associada, realizou estudo que confirmou infeção da prótese vascular em trajeto íleo-femoral com necessidade de exérese.

Tabela 1 **Maior diâmetro a nível para-anastomótico ao longo do tempo de seguimento por ultrassonografia ou AngioTC (quando especificado). AFS – artéria femoral superficial, AP – artéria poplítea.**

Follow-up (anos após cirurgia índice)	AFS/anast. proximal (cm)	AP / anast. Distal (cm)
2	1,7	1,4
3	2,4	1,5
4	2,4	1,6
5	2,8	1,6
6	2,8	1,6
9	3,1	1,8
12	3,7	2,0
12	4,6 (AngioTAC)	2,2 (AngioTAC)
14	-	2,3
15	-	2,5
16	-	2,8
17	-	3,1 (AngioTAC)

Aos 11 anos após cirurgia índica foi, também, diagnosticado aneurisma artéria hipogástrica direita com 3,7cm, posteriormente tratado com embolização com coils e colocação de stent revestido entre a artéria ilíaca comum direita e a AIE, com bom controlo final. Sem endofugas ou outras complicações no pós-operatório.

Cerca de 1 ano depois, novo episódio de erisipela associada a lesão trófica no terço distal da perna, com novo internamento na Dermatologia.

Aos 12 anos de seguimento, realizou AngioTC que revelou aneurismas para-anastomóticos MID com 4,8cm a nível proximal e 2cm a nível distal, tendo-se realizado ressecção de aneurisma verdadeiro proximal com interposição de enxerto protésico entre a AFS e o conduto venoso de BFP prévio, com boa evolução pós-operatória.

Constatado crescimento progressivo de aneurisma para-anastomótico distal a um ritmo de aproximadamente 2,7 mm/ano, confirmado com AngioTC (Figura 1) aos 73 anos (17 anos depois da cirurgia índice), assintomático e não complicado (Tabela 1).

Submetido a tratamento cirúrgico por abordagem poplítea distal com referenciação de conduto venoso de

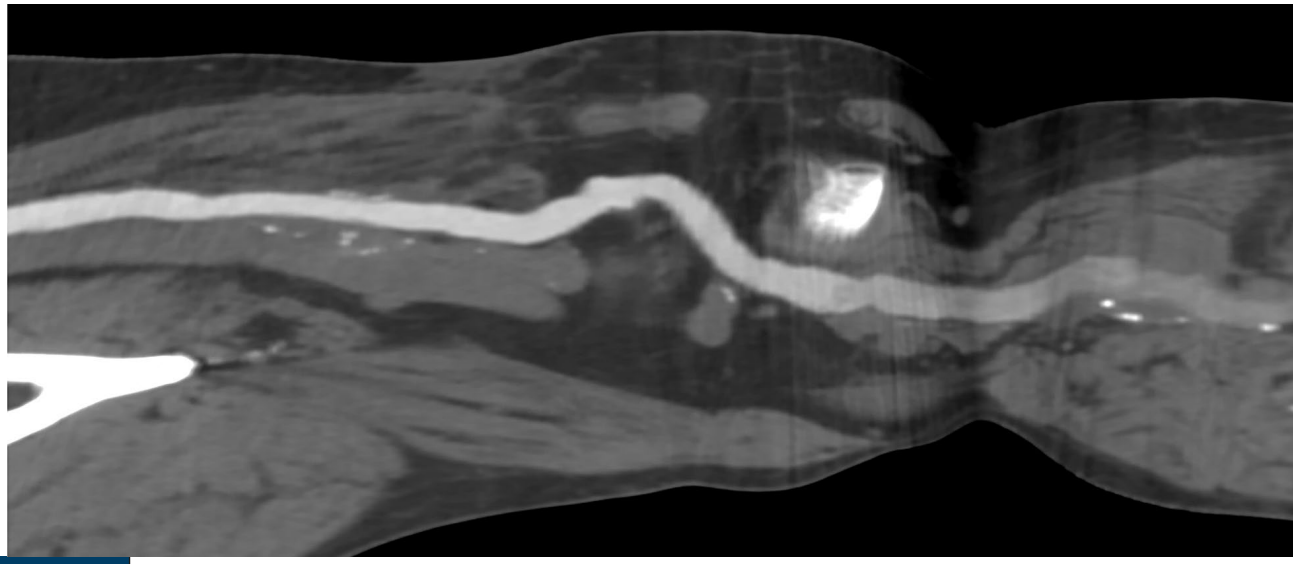

Figura 1

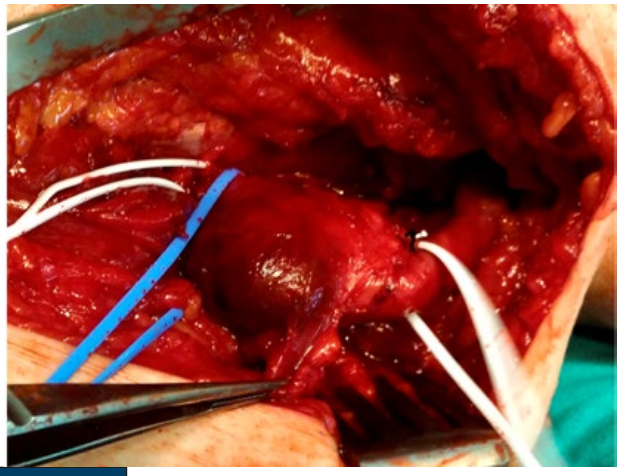

Figura 2

bypass prévio e da artéria poplítea distal (Figura 2). Ressecado aneurisma verdadeiro para-anastomótico e, devido a redundância de conduto, realizada plastia de encurtamento deste com anastomose termino-terminal a artéria poplítea. Aos 20 meses de seguimento apresenta pulsos distais sem imagens sugestivas de degenerescência aneurismática ou aneurismas associados.

DISCUSSÃO

Os aneurismas para-anastomóticos são raros, e a incidência relatada na literatura pode chegar aos 36% aos 15 anos, sendo os falsos bastante mais frequentes que os verdadeiros.[1,2] Habitualmente aparecem nos primeiros 5 anos de pós-operatório, apesar de poderem desenvolver-se em qualquer altura.[1,2]

Os principais fatores de risco são aterosclerose marcada, hipertensão arterial, tromboendarterectomia associada, anastomose na região inguinal e utilização de conduto protésico.

É de salientar a importância de um despiste de patologias associadas (doenças tecido conjuntivo, por exemplo) que aumentam o risco desta complicação.[1,2]

Os estudos disponíveis indicam que a principal causa para o aparecimento deste tipo de aneurismas é um processo degenerativo crónico lento da parede arterial adjacente à anastomose provocado por forças de cisalhamento anormais ao nível da anastomose.[1,2,3] Não parece haver relação com o material de sutura ou com a deterioração do conduto.[2]

Tabela 2 **maior diâmetro a nível para-anastomótico distal por ultrassonografia/AngioTC, de acordo com idade do doente.**

Follow-up (anos após cirurgia índice)	AP / anast. Distal (cm)
2	1,4
3	1,5
4	1,6
5	1,6
6	1,6
9	1,8
12	2,2 (AngioTAC)
14	2,33
15	2,5
16	2,79
17	3,14 (AngioTAC)

CONCLUSÃO

Este trabalho, através da descrição de um caso clínico, pretende chamar a atenção para a importância de um seguimento rigoroso e metódico, não só clínico, mas também imagiológico, dos doentes submetidos a tratamento de aneurismas periféricos. O estudo deve versar não só a presença de aneurismas associados, mas também a possível degenerescência aneurismática em segmentos arteriais envolvidos em reparações prévias.

Estamos, assim, perante uma patologia de carácter difuso que pode surgir em qualquer segmento arterial, em qualquer fase do seguimento, de forma assintomática. Como tal, aneurismas para-anastomóticos em crescimento ou sintomáticos devem ser tratados prontamente pois as suas complicações podem ser desastrosas.

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IMAGENS EM MEDICINA

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Aneurisma em *bypass* periférico com veia grande safena

Aneurysm in peripheral bypass with great saphenous vein

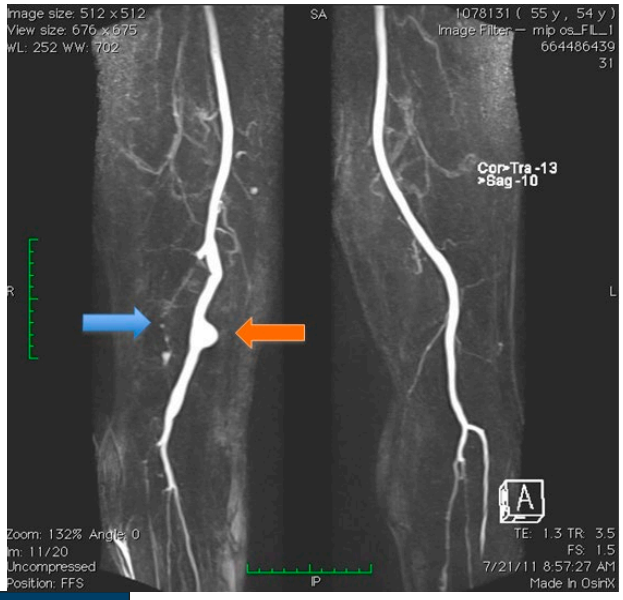

Figura 1

Homem de 54 anos. Submetido previamente a bypass com enxerto venoso por oclusão de aneurisma poplíteo direito. Admitido por isquemia aguda por oclusão do enxerto venoso, com aneurisma de 23mm. A angiorressonância prévia à oclusão mostra o enxerto ainda permeável (seta laranja), assim como o aneurisma arterial trombosado (seta azul).

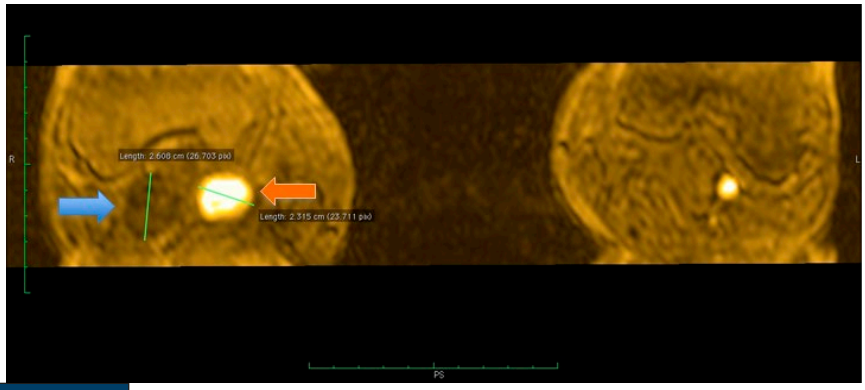

Figura 2

TÉCNICAS CIRÚRGICAS

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Lobectomia toracoscópica uniportal assistida por vídeo: como o fazemos!

Uniportal video-assisted thoracoscopic lobectomy: how we do it!

INTRODUCTION

Video-assisted thoracic surgery (VATS) anatomic lobectomy was initially described two decades ago. The first uniportal VATS lobectomy was described by Gonzalez-Rivas and colleagues, from Coruña University Hospital in 2010.[1] Since then, many units have successfully adopted this technique, albeit its precise definition and description greatly vary between them.

This technique is being embraced for several benefits. One of them is that it ensures direct visualization and a good exposure of the lung. Second, postoperative pain is reduced due to the involvement of only one intercostal space without rib spreading. Third, aesthetics factors are improved significantly and when used in the oncological field principles and radicality of open surgery are safeguarded.[2]

The next paper describes the technique for VATS single-port lobectomies used in our center.

General aspects and basic surgical principles

The patient is placed in lateral decubitus position with arms flexed and stretched toward the head in order to allow room for the surgeon and his assistant to stand in front of the patient (Figure 1). The procedure is performed under general anesthesia and double lumen intubation.

The 2–4 cm single incision is usually made in the 5th or 6th intercostal space. Then we use a wound protector to avoiding soiling of the camera and have more space for instruments.

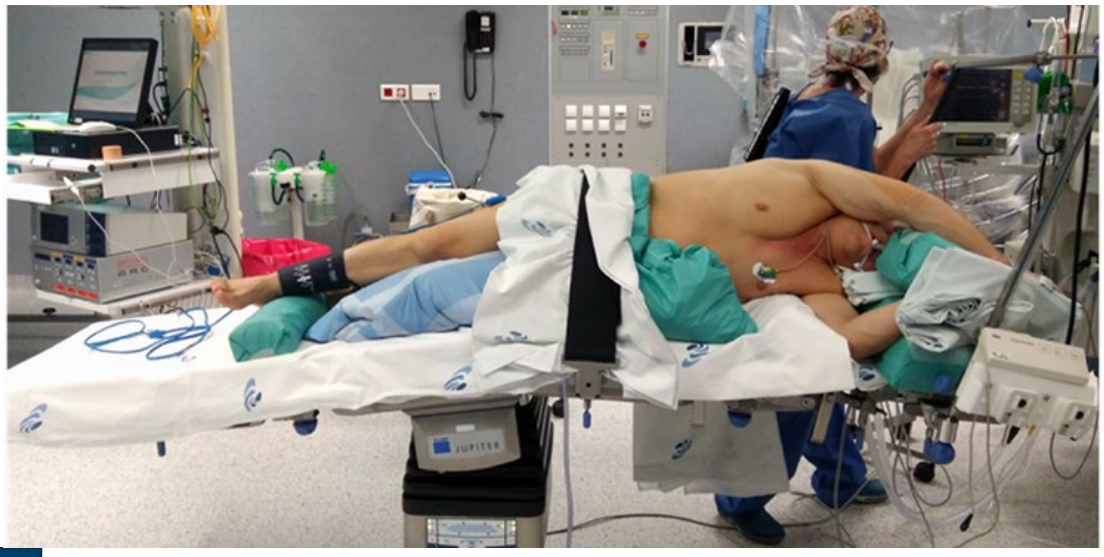


Figura 1

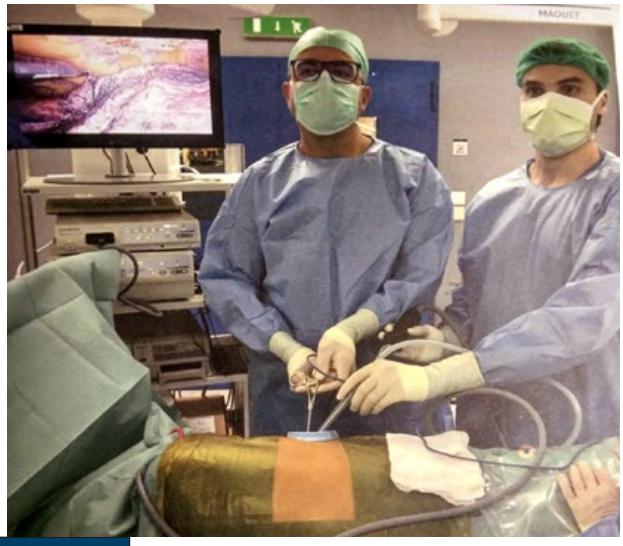


Figure 2

The thoracoscope is introduced and both surgeons look at the same screen located opposite to them. The scrub nurse is located on the opposite side (Figure 2).

At the end of the operation, the surgical specimens are removed with an Endobag that must be pulled out through the wound (Figure 3 and 4).

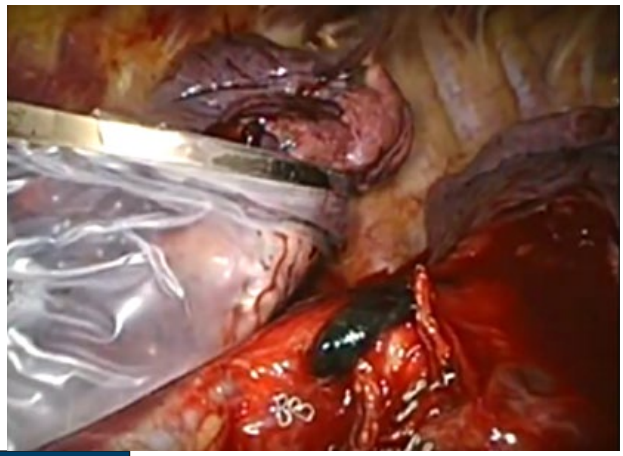


Figure 3

At the end of the procedure, a paravertebral intercostal nerve block is performed, infiltrating ropivacaine in 3 intercostal spaces above and below the incision.

One 27 Fr chest tube is inserted with its tip towards the apex. The tube is fixed on the skin suture. The incision is closed through suturing the serratus muscle without using any intercostal suture and then the subcutaneous tissue is closed (Figure 5 and 6).

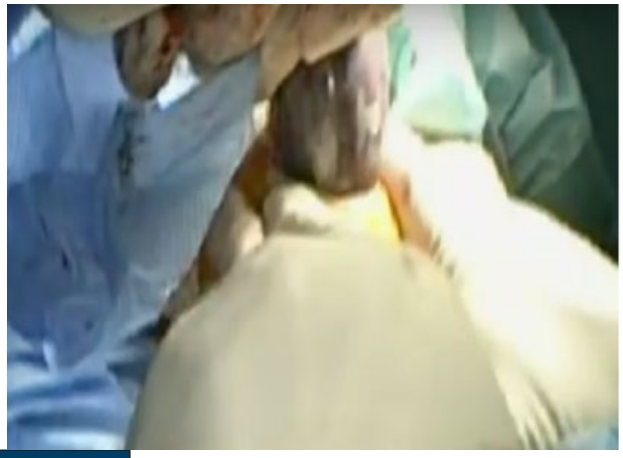


Figure 4

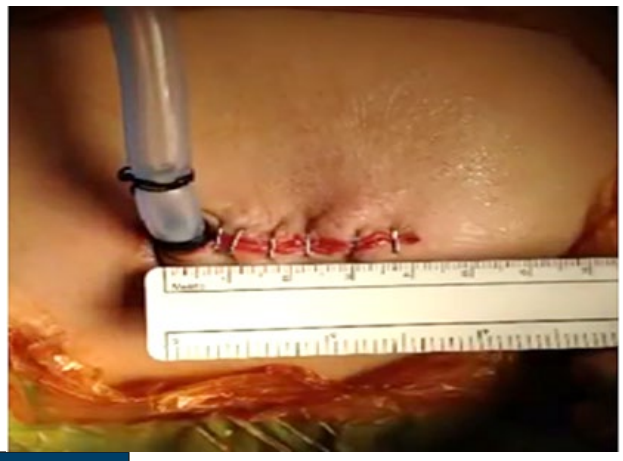


Figure 5

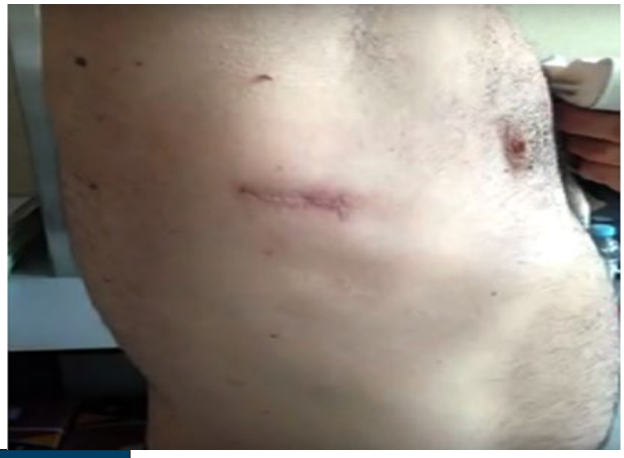
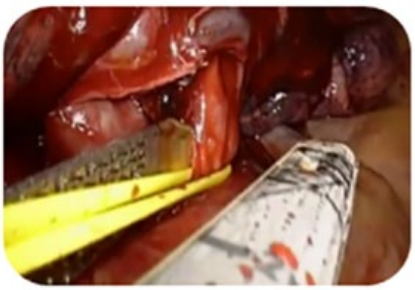


Figure 6

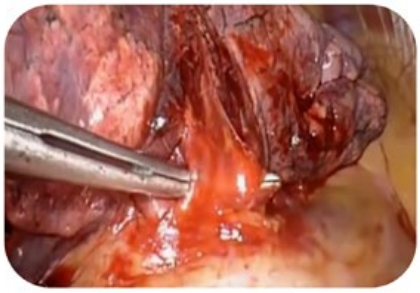
OPERATIVE TECHNIQUES

RIGHT UPPER LOBECTOMY



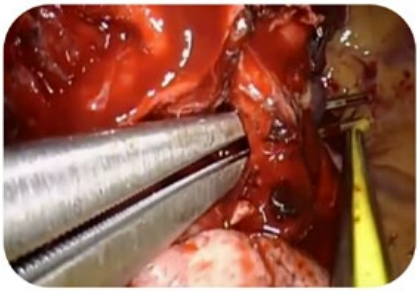
(I) Identification of the upper vein and anterior arterial trunk

(II) Dissection and division of the anterior trunk

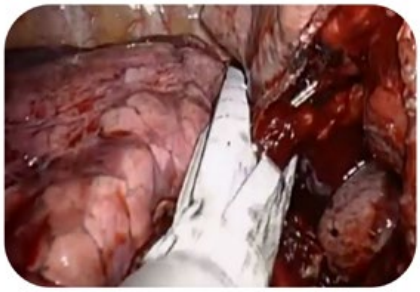


(III) Identification of the middle lobe vein and then division of the upper vein

(IV) Identification and division of posterior segmental artery (mediastinal artery)



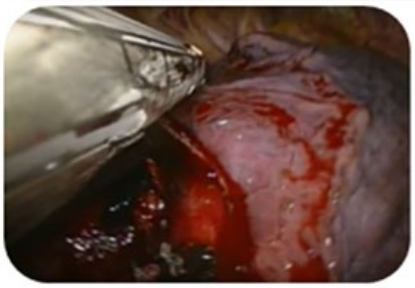
(V) Dissection and division of the upper bronchus



(VI) Dissection of the anterior parenchyma between upper and middle lobes and then dissection of the posterior parenchyma between upper and lower lobes

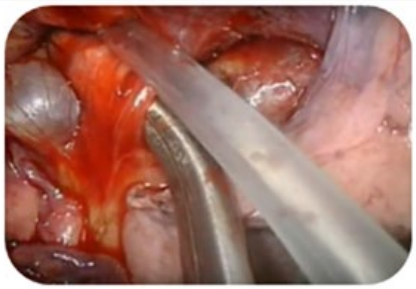
(VII) Dissection of the ligament.

MIDDLE LOBECTOMY

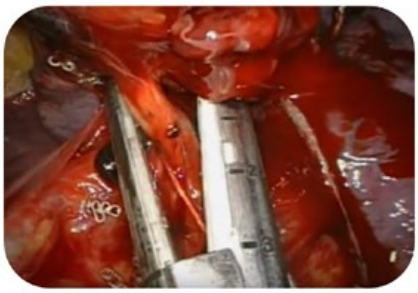


(I) Identification of the right lower, upper and middle vein

(II) Dissection of the anterior parenchyma between upper and middle lobe

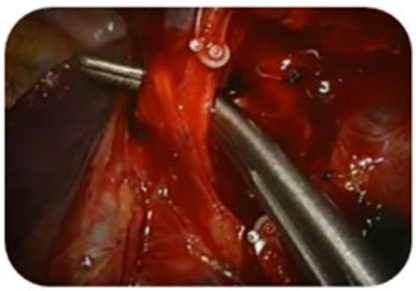


(III) Dissection and division of the middle vein



(IV) Identification and division of the midlle lobe artery

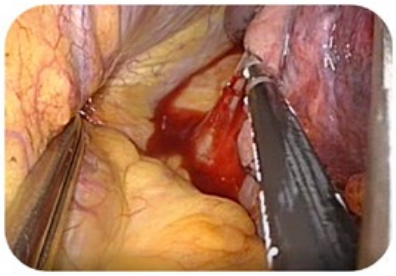
(V) Identification of the middle lobe bronchus, B6 and the basal pyramid



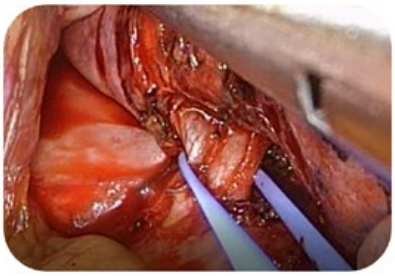
(VI) Dissection and division of the middle lobe bronchus (after checking inflation of the upper and lower lobe)

(VII) Dissection of the parenchyma between middle and lower lobes

RIGHT LOWER LOBECTOMY

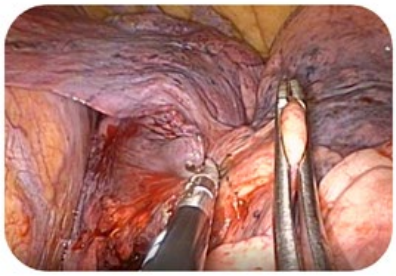


(I) Dissect the ligament

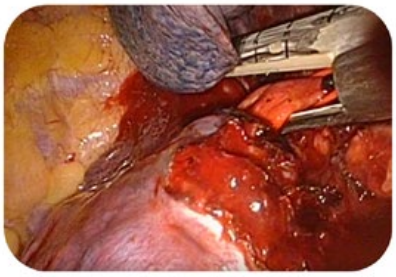


(II) Identify the right lower and middle vein

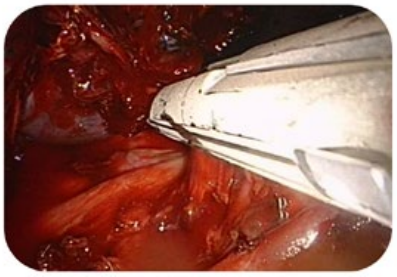
(III) Dissect and divide the lower vein



(IV) Dissect the anterior parenchyma between lower and middle lobe



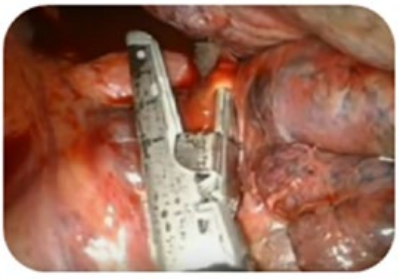
(V) Complete dissection and division of the arterial branches for basal pyramid and superior segmental artery (A6)



(VI) Dissect and divide the lower lobe bronchus

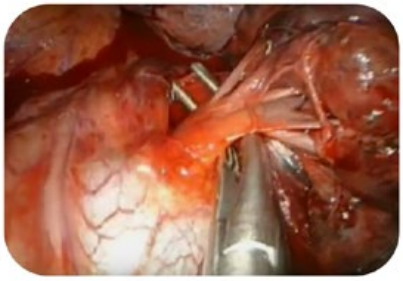
(VII) Dissect the posterior parenchyma

LEFT UPPER LOBECTOMY

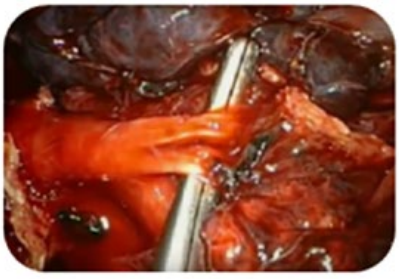


(I) Identification of the upper vein and lower vein

(II) Identification, dissection and division of the anterior artery



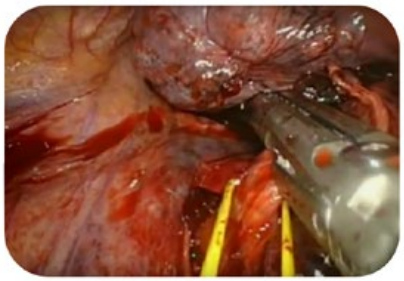
(III) Division of the upper vein



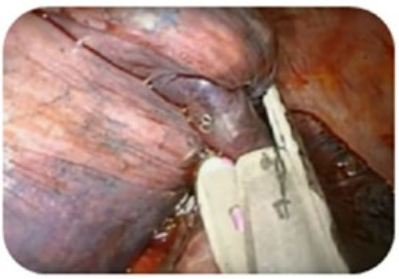
(IV) Dissection of the anterior parenchyma

(V) Identification and division of the lingular arteries

(VI) Dissection and division of the remaining arterial branches to the superior lobe



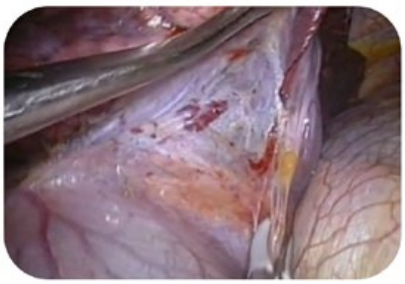
(VII) Dissection and division of the upper bronchus (after checking inflation of the lower lobe)



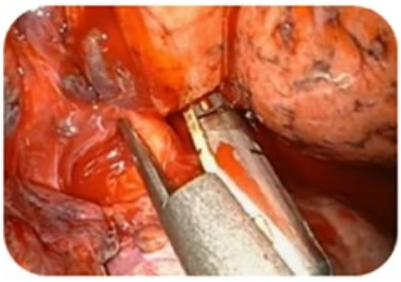
(VIII) Dissection of the posterior parenchyma (after identification of the superior segmental artery, A6)

(IX) Dissection of the ligament

LEFT LOWER LOBECTOMY

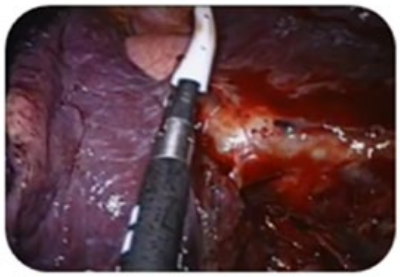


(I) Dissect the ligament

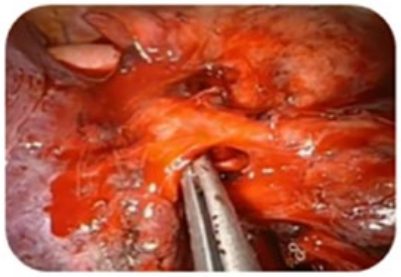


(II) Identify the upper vein and lower vein

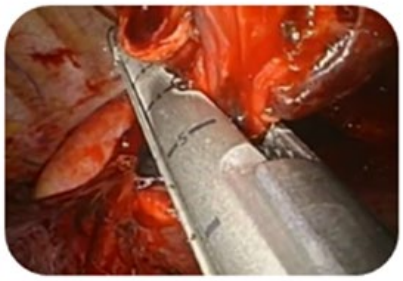
(III) Divide the lower vein



(IV) Dissect the anterior parenchyma



(V) Identify and divide the arterial branches to basal pyramid with or without the superior segmental artery (A6)



(VI) Dissect and divide the lower bronchus (after checking inflation of the upper lobe)

(VII) Dissect the posterior parenchyma

CONCLUSION

According to our experience, uniportal VATS is a feasible and safe technique even to lung cancer treatment. Good cosmetic result, reduced patient discomfort and pain allowing short internments makes the uniportal VATS the approach of choice in our department.

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CARDIAC SURGERY

ORAL COMMUNICATIONS & SHORT COMMUNICATIONS

SELECTED ORAL COMMUNICATIONS
Sunday, November 25th, 9:00 a.m.

CS-01

COMPLETE VERSUS INCOMPLETE REVASCULARIZATION: LONG-TERM SURVIVAL AFTER CABG

Francisca A. Saraiva (Portugal)[1,2]; Rui J. Cerqueira (Portugal)[1,2,3]; Raquel Moreira (Portugal)[1,2]; Ana Filipa Ferreira (Portugal)[1,2]; Mário J. Amorim (Portugal)[1,2,3]; Paulo Pinho (Portugal)[2,3]; André P. Lourenço (Portugal)[1,2,4]; Adelino F. Leite-Moreira (Portugal)[1,2,3]

[1] Departamento de Cirurgia e Fisiologia, Faculdade de Medicina, Universidade do Porto; [2] Unidade de Investigação Cardiovascular - UnIC, Faculdade de Medicina, Universidade do Porto; [3] Departamento de Cirurgia Cardiotorácica, Centro Hospitalar Universitário de São João - CHUSJ, Porto; [4] Departamento de Anestesiologia, Centro Hospitalar Universitário de São João - CHUSJ, Porto

Background: There is conflicting evidence regarding the outcomes of complete revascularization (CR) in coronary artery bypass grafting (CABG).

Aim: To compare long-term survival and early outcomes of CABG surgery using CR versus incomplete revascularization (IR).

Methods: Retrospective single-center cohort study including consecutive patients who underwent 1st isolated CABG with at least 2-vessels disease, during a 10-year period. Emergent surgeries (performed before the beginning of the next day) were excluded. An anatomical definition for completeness was used: CR was considered if all diseased territories (at least one branch with stenosis ≥ 50%) were revascularized with at least 1 graft (stent was also considered to right coronary artery hybrid procedures). Propensity scores (PS) were estimated through a non-parsimonious multivariate logistic regression model and included in multivariate regressions as a covariate along with CR. Cox and logistic regressions were used to estimate the effect of CR in long-term survival and early outcomes, respectively. Mean follow-up time was 7 years, maximum 13.

Results: CR was performed in 47% out of 3154 included patients. Mean patient's age was 64±10 years and 80% were male. Patients with CR were younger (63±10 vs. 65±10, $p<0.001$) and presenting less frequently with 3-vessels disease (65% vs. 86%, $p<0.001$), chronic kidney disease (55% vs. 59%, $p=0.045$) and peripheral and cerebral artery disease (13% vs. 19%, $p<0.001$ and 7% vs. 11%, $p<0.001$, respectively). Regarding

surgical variables, bilateral internal mammary artery was more often used in CR patients (39% vs. 28%, p<0.001), but no difference was found regarding the use of cardiopulmonary bypass (57% vs. 55%, p=0.346). Kaplan-Meier curves showed a significant benefit for CR patients with long-term cumulative survival of 66% vs. 55% at 13 years of follow-up (Log-rank, p<0.001). CR technique was also associated with better survival in PS adjusted cox regression (HR: 0.80, CI 95%: 0.68-0.95, p=0.010). In-hospital death (1%), prolonged mechanical ventilation time (>24h, 6%), length of hospital-stay ≥7days (53%), need of inotropic support (≥ 2 amines, 16%) and post-operative atrial fibrillation (19%) were similar between the 2 groups.

Conclusion: In this long-term follow-up study, CR revealed to be a significant predictor of better prognosis considering all-causes of death, without impact in early postoperative results. Further randomized prospective studies are needed to provide recommendations on revascularization techniques.

CS-02
TRIPLE VALVE SURGERY: 10-YEAR FOLLOW-UP FROM A SINGLE CENTER

Paulo 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 Bruges (Portugal)[1]; José Calquinha (Portugal)[1]; Miguel Sousa Uva (Portugal)[1]; Miguel Abecasis (Portugal)[1]; José Neves[1]

[1] Hospital Santa Cruz - CHLO

Introduction: Despite all the improvements in cardiac surgery, triple valve surgery (TVS) remains a challenging procedure. In the literature, this surgery carries 30-day mortality of 6-25%, with 10-year survival of 61-75%. The perioperative complication rate is around 50%.

Objectives: Analyze early and late outcomes of TVS and identify predictors of poor prognosis.

Methods: Single center retrospective study of all patients who underwent TVS between 2007 and 2016. Exclusion criteria: congenital heart diseases, active endocarditis, urgent surgery and concomitant coronary artery disease. One hundred and eight patients were submitted to TVS, with a mean age of 65 years old and 25,9% male gender. Clinical records and National Data Base were used for long term follow-up. The median follow-up of survival and freedom from reoperation were 3,8 years (IQR: 1,8-7,4) for 98% and 1,8 years (IQR:0,25-5,4) for 94,5% of the patients, respectively. Logistic regression and Cox proportional analysis were used with all clinical relevant variables selected a priori (not a stepwise method). Long-term survival was estimated using the Kaplan-Meier method.

Results: The majority of the patients undergoing TVS were in the New York Heart Association class III (50,9%). The most common type of presentation was aortic mixed disease (40,7%), mitral (34,3%) and tricuspid regurgitation (93,5%). The majority of TVS was the replacement of aortic (98,1%) and mitral (92,6%) valves, accompanied by tricuspid repair (97,2%).

The 30-day mortality was 10,2% and no risk factors were identified on multivariate analysis.

This group had 28,7% rate of in-hospital major complications. We identified DM (p=0,043) and ventilation time (VT) (p=0,008) as independent risk factors. Patients were discharged from hospital at 20,9 ± 24,6 days.

The 10-year mortality was 29,6%. The predictors of long-term mortality were HD (p=0.027), DM (p=0.017), and VT (p=0,018). Overall, the actuarial survival at 1, 5 and 10 years was 82,4%, 77,8% and 70,4%, respectively. Late complications with need for re-operation were identified in 3,5%, at a median time of 4 years after hospital discharge. No risk factors for late events were established.

Conclusion: Patients undergoing TVS are mostly associated with complex diseases and comorbidities, making TVS a high risk operation. Our experience has a similar mortality rate as recent series. However, this study reports a lower complication rate, possibly explained by the experience of a single center along the years. This research identify DM, HD and VT as the future challenges in TVS.

CS-03
PROGNOSTIC IMPACT OF TRICUSPID VALVE SURGERY FOR MODERATE-TO-SEVERE REGURGITATION AT THE TIME OF AORTIC VALVE REPLACEMENT

André Antunes (Portugal)[1]; Carlos Branco (Portugal)[1]; Gonçalo Coutinho (Portugal)[1]; David Prieto (Portugal)[1]; Pedro Antunes (Portugal)[1]; Manuel Antunes (Portugal)[1]

[1] Serviço de Cirurgia Cardiotorácica do Centro Hospitalar e Universitário de Coimbra

Introduction: Significant functional tricuspid regurgitation (FTR) is associated with poor long-term survival due to a higher incidence of right-side heart failure. The management of FTR in patients with aortic valve disease seems to be as important as when it is associated with mitral valve disease. However, few studies have reported the impact of tricuspid valve disease at the time of aortic valve surgery.

Objective: We aimed to evaluate the impact in long-term survival of moderate-to-severe FTR at the time of aortic valve surgery.

Methods: From January 2005 to December 2016, 258 consecutive patients underwent aortic valve replacement (AVR) and had preoperative moderate-to-severe FTR. Of those patients, 63 had concomitant tricuspid valve surgery. Patients were divided in two groups: patients who had concomitant tricuspid valve surgery (AVR+TVS; n=63) and patients who had isolated AVR (n=195). Cox proportional hazards models were used to analyze risk factors for survival and Kaplan-Meier methods were used to plot survival curves.

Results: Mean age was (AVR+TVS vs. AVR) 70.2±10.0 vs. 72.6±9.3 years (p=0.096), 56.1% vs. 45.1% were male (p=0.384) and 42.9% vs 48.2% had severe aortic stenosis (p=0.472). Chronic pulmonary obstructive disease was present in 9.5% vs. 10.8% (p=0.779), preoperative atrial fibrillation in 59.7% vs. 34.4% (p=0.001), 61.9% vs. 49.2% were in NYHA class 3/4 (p=0.084) and 12.7% vs. 4.6% were redo surgery, respectively. Long term survival at 10 years was similar between the two groups (61.6±8.1 vs. 48.7±6.4, p=0.512) as well as the incidence of major adverse cardiac and cerebrovascular events in long term follow up (42.9±10.1 vs. 51.0±5.5, p=0.349)

Conclusion: Adding tricuspid valve annulloplasty to aortic valve replacement did not show a significant impact in long term outcomes in these patients.

ORAL COMMUNICATIONS 1

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

CO-01

AORTIC STENOSIS AND SEVERE LEFT VENTRICULAR DYSFUNCTION: OUTCOMES AND QUALITY OF LIFE FOLLOWING AORTIC VALVE REPLACEMENT

Manuela Silva (Portugal)[1]; Rui Cerejo (Portugal)[1]; Carolina Rodrigues (Portugal)[1]; Pedro Coelho (Portugal)[1]; Helena Semedo (Portugal)[1]; José Fragata (Portugal)[1]

[1] Hospital Santa Marta, CHLC

Background/Objectives: Severe aortic stenosis has a high health burden. Patients with impaired left ventricular function have an increased operative risk and the outcomes following aortic valve replacement are believed to be worse. The purpose of this study was to assess the impact of severe left ventricular dysfunction on clinical outcomes, one year mortality and quality of life after aortic valve replacement.

Methods: Retrospective study of 50 adult patients with severe aortic stenosis and left ventricular dysfunction (ejection fraction <30%), who underwent isolated aortic valve replacement (AVR), between January 2008 and September 2017. Quality of life (QOL) parameters using the validated short form 36 (SF-36) questionnaire were determined before and at one year after surgery and analysed using the Wilcoxon matched pairs rank test.

Results: Fifty patients underwent AVR (66% biological and 34% mechanical prosthesis), mean age 66,8±10,8 years, 84% male and mean BMI 26,8kg/m2. One third had prior history of myocardial infarction and persistent/ paroxysmal atrial fibrillation. Mean pressure gradient was 43 mmHg and mean logistic EuroSCORE was 16,4%. An urgent/emergent procedure was performed in 7 patients (14%). The overall mean bypass time was 105,9 ± 26,9 minutes and aortic cross-clamp time of 80,4±17,3 minutes. The most common postoperative complications were need for inotropic support longer than 48 hours (28%), new onset of atrial fibrillation (20%), prolonged invasive ventilation over 24 hours (12%) and renal failure undergoing dialysis (8%). Mean ICU stay was 2,9±2,5 days and the total length of stay 9,9±7,2 days. In-hospital mortality was 10% and one year mortality 14%. Following AVR there was significant improvement (p<0,001) in all eight QOL parameters at 1 year follow up, comparing to preoperative assessment, namely (i) physical function), (ii) physical performance, (iii) pain, (iv) general health, (v) vitality, (vi) social function, (vii) emotional performance and (viii) mental health. Overall QOL physical and mental dimensions significantly improved 1 year follow-up (p<0,001).

Conclusions: Patients with aortic stenosis with severely impaired left ventricular function are at higher surgical risk and it impacts negatively the postoperative course. The burden of disease can be individually monitored using valuable tools such as SF-36 health survey in the follow-up. In our report, one year survival was 86% and, in this population, mental and physical quality of life have considerably improved.

CO-02

VALVE PATCH CLOSURE OF VENTRICULAR SEPTAL DEFECTS

Márcio Madeira (Portugal)[1]; Duarte Martins (Portugal)[1]; Sara Ranchordás (Portugal)[1]; João Rato (Portugal)[1]; Paulo Oliveira (Portugal)[1]; Tiago Nolasco (Portugal)[1]; Marta Marques (Portugal)[1]; Rui Anjos (Portugal)[1]; Miguel Abecasis (Portugal)[1]; José Neves (Portugal)[1]

[1] Hospital de Santa Cruz

Introduction: Pulmonary hypertension (PH) due to high pulmonary arteriolar resistance (PAR) is a possible complication of congenital heart defects with left-right shunt. High PAR can be fixed or still responsive to pulmonary vasodilators or to hypertensive stimuli. Repair of ventricular septal defect (VSD) in these patients has a high risk of morbidity and mortality and PH crisis after repair can lead to a poor outcome. These patients are rare in developed countries, but these situations are frequent in underdeveloped countries. Use of a valved patch can lead to a better outcome.

Objective: The aim is to study the safety and efficacy of closing VSD with a valved patch.

Methods: Single centre retrospective study, with all consecutive patients from 2003 to 2017. In ten patients the VSD was closed with a fenestrated patch and a valved mechanism that permitted flow through it from the right to the left ventricle. Median age was 5,6 (1,6-24,2) years, 30% female gender, isolated VSD in 7 patients associated patent ductus arteriosus in 1 patient and atrioventricular septal defect in 2 patients. Pre-operative diagnosit assessment was performed with echocardiography, cardiac catheterization and nitric oxide (NO) vasodilatation test. Median clinical and imagiological follow-up was 1,26(0,4-8,6) years. Wilcoxon signed rank test was used to evaluate the differences between pre and post-operative variables.

Results: Preoperatively the lefto to right shunt increased with the NO test (Qp/Qs: 2±0,8 to 6,7±4,4 after NO, p=0,012) and pulmonary vascular resistance fell accordingly (7,4±3,7 W to 2,3±1,8W after NO, p=0,012). All patients had some response to pulmonary vasodilatation. Pulmonary artery systolic pressure (PASP) was not significantly lower after repair (65,3±10,5 mmHg to 44,9±19 mmHg at last follow-up, p=0,074) neither pulmonary to systemic pressure ratio (0,92±0,22 to 0,88±0,19 mmHg, p=0,128). Arterial oxygen saturation was significantly better after repair (91±10% to 98±2%, p=0,024). Right to left shunt was verified at discharge in 5 patients and in 2 at last follow-up, showing that the valve patch was working as planned for high PAR situations. No left to right shunt was observed, demonstrating de safety of the procedure. No hospital or follow-up mortality.

Conclusion: Repair of VSD associated with PH with valve patch is a safe and effective procedure. A right to left shunt through the valved patch was detected in half of the patients at hospital discharge. After repair there was a significant increase in peripheral oxygen saturation.

CO-03

IMPACT OF PULMONARY VALVE REPLACEMENT: A MAGNETIC RESONANCE ASSESSMENT

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

[1] Cirurgia Cardíaca do Hospital de Santa Marta, CHLC

Objectives: An increasing number of patients with congenital heart disease survive until adulthood. Pulmonary valve replacement is the most frequent reoperation performed in adults with congenital heart disease. Without intervention, pulmonary regurgitation leads to right ventricular dilatation and, consequently, dysfunction and arrythmias. Severe right ventricle dilatation also contributes to shape changes of the left ventricle, thereby causing biventricular dysfunction. The most accurate method to assess the degree of pulmonary regurgitation and right ventricle size is cardiac magnetic resonance. We aim to evaluate the results of pulmonary valve replacement at our institution.

Methods: We performed a descriptive analysis of 66 patients that undergone pulmonary valve replacement, between 2003 and 2016, and a subgroup analysis of patients that were evaluated by cardiac magnetic resonance, both pre and post-operatively.

Results: Of the 66 patients, 67% (n=44) are male. Predominant diagnosis (80%) is tetralogy of Fallot (n=53), while 8% (n=5) have congenital pulmonary valve stenosis, 5% (n=3) have pulmonary atresia with interventricular communication and 3%(n=2) have pulmonary atresia with intact interventricular septum. Surgical indication was severe pulmonary insufficiency in 88% (n=58), pulmonary stenosis in 6% (n=4) and mixed stenosis and insufficiency in 6%. In only one patient was implanted a mechanical valve. Mean age at surgery was 30,5 years. Mean follow-up time is five years. The last evaluation by transthoracic echocardiogram showed that 32%, 20% and 7% have mild, moderate and severe pulmonary regurgitation, respectively. There are no cases of endocarditis, prothesis replacement or mortality. Twenty patients were evaluated by a cardiac magnetic resonance both pre-operatively (mean time 17 months before) and post-operatively (mean time 34 months after). Pre-operative end-diastolic and end-systolic right ventricle mean volumes are 310 and 168 ml, respectively. Post-operative end-diastolic and end-systolic right ventricle mean volumes are 187 and 114ml, respectively. The difference between mean volumes is statistically significant, both for end-diastolic and end-systolic volumes ($p<0.05$). There is a statistically significant reduction at right ventricle ejection fraction ($p<0.05$). However, there is a significant increase in left ventricle ejection fraction ($p<0.05$).

Conclusion: Despite a 40% reduction on right ventricle volumes, the incomplete resolution of RV dilation in our patient population probably indicates that PVR was undertaken too late. There is however, a significant improvement in left ventricle ejection fraction. A long-term follow-up and a standardized pre and post-operative evaluation with cardiac resonance are of major importance.

CO-04

SURGICAL ABLATION OF ATRIAL FIBRILLATION BY A TOTALLY THORACOSCOPIC APPROACH- A REAL BENEFIT AFTER UNSUCCESSFUL CATHETER ABLATION?

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

[1] Cirurgia Cardíaca do Hospital de Santa Marta, CHLC

Objectives: Maze surgery, despite several modifications, is still a time-consuming invasive procedure. Catheter ablation presents with highly variable rates of success. Surgical ablation of atrial fibrillation by a totally thoracoscopic approach, using radiofrequency, is a recent alternative, that we performed for the first time on November 2017. We aim to determine the success of this approach, namely conversion to sinus rhythm after surgery and at one, 6 and 12 months.

Methods: We performed a descriptive analysis of 11 patients submitted to surgical ablation of atrial fibrillation and occlusion of the left appendage by a totally thoracoscopic approach. We describe the surgical technique and our results, including duration of surgery, hospital stay, complications and conversion to sinus rhythm immediately after surgery, at one and 6 months of follow-up.

Results: Of the 11 patients, with ages between 39 and 75 years old, 45,5% (n=5) are male. The mean time since atrial fibrillation diagnosis was 5 years. Seven patients had paroxysmal atrial fibrillation. All had been submitted to prior catheter ablation (mean of 2 attempts). The mean diameter and volume of left atrium was 42 mm and 70 ml (43 ml/m2). The mean duration of surgery was 2hours and 25 minutes. Conversion to median sternotomy occured in one patient. Conversion to sinus rhythm and left atrial occlusion was obtained in all patients. Pacemaker implantation was needed in one patient. The mean hospital stay was 4,8 days. The procedure was not possible to perform in one patient. The mean time of follow-up is 7,8 months. At one month follow-up, 80% of the patients (n= 8) were in sinus rhythm. At 6 months of follow- up, 86%(n=6) were in sinus rhythm, accordingly with an holter register.

Conclusion: We are aware of the small dimensions of this population and short period of follow-up. We can not deduce about the superiority of this approach comparing to the other surgical/catheter alternatives. On November 2018, 4 patients will complete one year of follow-up and will be evaluated with an event monitoring report. This approach appears to be minimally invasive, safe, with a reasonably fast learning curve. Most importantly, it can represent a real benefit for patients with multiple attempts of catheter ablation without success.

CO-05

PROGNOSTIC VALUE OF CARDIAC TROPONIN AFTER CORONARY ARTERY BYPASS GRAFTING

Francisca A. Saraiva (Portugal)[1,2,3]; Rui J. Cerqueira (Portugal)[1,2,3]; Mário J. Amorim (Portugal)[1,2,3]; Cristina Gavina (Portugal)[1,3,4]; Paulo Pinho (Portugal)[2,3]; André P. Lourenço (Portugal)[1,3,5]; Adelino F. Leite-Moreira (Portugal)[1,2,3]

[1] Departamento de Cirurgia e Fisiologia, Faculdade de Medicina, Universidade do Porto; [2] Departamento de Cirurgia Cardiotorácica, Centro Hospitalar Universitário de São João - CHUSJ, Porto; [3] Unidade de Investigação Cardiovascular - UnIC, Faculdade de Medicina, Universidade do Porto; [4] Departamento de Cardiologia, Hospital Pedro Hispano; [5] Departamento de Anestesiologia, Centro Hospitalar Universitário de São João - CHUSJ, Porto

Background: Multiple definitions to myocardial infarction (MI) related to coronary artery bypass grafting (CABG) have been proposed.

Aim: To determine cardiac troponin I's (cTn) predictive capacity to define adverse events after CABG. To estimate sensibility (SE), specificity (SP) and positive (PPV) and negative predictive values (NPV) of cTn using 2 different cut off values: >10x99thpercentile (European Society of Cardiology, 2012) and >70x99thpercentile (Society for Cardiovascular Angiography and Interventions, 2013) and to assess the concordance grade between these two values.

Methods: Retrospective cohort including all CABG patients who presented cTn < 10x99P before surgery. Data were collected through clinical files, including maximum cTn after surgery. Post-operative complications were evaluated one by one and as combined endpoint: in-hospital mortality (HM), prolonged mechanical ventilation time, low cardiac output (LCO) defined as at least 2 amines or intra-aortic balloon pump, reexploration of thorax due to bleeding, post-operative atrial fibrillation (POAF) episodes and length of stay (LOS) > 6 days. Receiver operating characteristic (ROC) curves were used to estimate cTn predictive capacity in respect to these outcomes and Cohen's Kappa statistic was used to assess concordance between the two definitions.

Results: We included 1994 patients, mean age of 64±10, the majority of them being male (81%). The mean post-operative cTn was 2.3 ng/mL in males (99thP: 0.034) and 2.1 in females (99thP: 0.016). A low discriminative capacity was determined for the majority of studied outcomes (POAF: 0.54; LOS: 0.59; HM: 0.66; reexploration due to bleeding: 0.64). Satisfactory areas under ROC curves (0.71) were determined for both LCO and prolonged mechanical

ventilation time. We registered 88% and 48% males and 93% and 66% females above 10x99P and 70x99P, respectively. A qualitative study using cut off values for cTn showed better AUC for 70x99P comparing with 10x99P (0.59 vs. 0.53) and a weak concordance (k=0.24) between 2 methods. SE, SP, PPV and NPV were defined for 10x99P and 70x99P to estimate combined endpoint: 91%, 15%, 60% e 55% e 60%, 59%, 67% e 50%, respectively.

Conclusion: This sample presented high values of maximum cardiac troponin values after CABG although without direct repercussion in post-operative outcomes. The 10xP99 cut off, being more sensible is also more associated with false negatives. We conclude that maximum cardiac troponin after CABG have a limited prognostic value.

CO-06

CLINICAL AND HAEMODYNAMIC PERFORMANCE OF 3 AORTIC BIOPROSTHESES: PERIMOUNT, TRIFECTA E FREEDOM SOLO

Soraia Moreira (Portugal)[1,2]; Francisca A. Saraiva (Portugal)[1,2]; Renata Melo (Portugal)[1,2]; Rui J. Cerqueira (Portugal)[1,2,3]; André P. Lourenço (Portugal)[1,2,4]; Mário J. Amorim (Portugal)[1,2,3]; Jorge Almeida (Portugal)[1,2,3]; Paulo Pinho (Portugal)[3]; Adelino F. Leite-Moreira (Portugal)[1,2,3]

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Introduction: The search for the ideal valve substitute is challenging and the need for systemic anticoagulation imposed by mechanical prostheses instigates the continuous improvement of bioprostheses. The high durability associated to Perimount (PM) competes with the excellent haemodynamic performance of the most recent bioprostheses (Trifecta, TF e Freedom Solo, FS).

Aim: To compare clinical and haemodynamic performance in patients who underwent aortic valve replacement surgery (AVRS) with bioprostheses PM, TF and FS.

Methods: Retrospective cohort study including all adult subjects who underwent AVRS with PM, TF or FS in 2012 at a central hospital. Pre- and post-operative clinical and echocardiographic data (postoperative TTE performed at 4±3 months) were collected. In February of 2017, mortality and the need for reintervention were evaluated (mean follow-up time of 4 years). Chi-square, ANOVA and Kruskal-Wallis tests were used to compare categorical and continuous variables among the 3 groups. Cumulative survival was assessed by Kaplan-Meier curves (Log-Rank test).

Results: A total of 306 individuals (182 PM, 81 TF and 43 FS) were included with mean age of 72±9 years and 54% were males. Preoperative and surgical characteristics were similar between groups. Valve stenosis was the most prevalent pathology in the 3 groups (84, 69 and 77%, respectively) and 10 patients had previous prosthesis dysfunction (5, 5 and 0 cases, respectively). Concomitant procedures were performed in 54% of patients (52, 56 and 58%, in each group, p=0.684). The most implanted prosthesis sizes were 21 (40%) and 23 (38%). For the PM, TF and FS bioprostheses, the mean transprosthetic gradients were 15±5, 11±4 and 13±4 mmHg (p<0.001) and the effective orifice areas were 1.6±0.3, 2.0±0.5 and 1.9±0.5 cm2 (p <0.001), respectively. Prosthesis-patient mismatch was observed in 24% patients and this incidence was significantly higher in PM group (31 vs. 14 vs. 12%, respectively, p=0.005). There were 7 reoperations: 5 PM due to endocarditis and 2 FS (1 due to endocarditis and 1 due to periprosthetic regurgitation). Cumulative survival was similar in the 3 groups (87, 76 and 86%, respectively, p=0.203).

Conclusions: The latest generation of bioprostheses revealed better haemodynamic profile than PM. A longer follow-up period will allow to evaluate the maintenance of these differences and their influence on durability and long-term results.

CO-07

CORONARY ARTERY BYPASS GRAFTING IN OCTOGENARIANS: EARLY AND LONG-TERM OUTCOMES

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Background: Age is a well-recognized risk factor in cardiac surgery leading to some concerns about the risk--benefit of cardiac surgery in octogenarians.

Aims: To identify the risk factors for early outcomes and long-term survival of coronary artery bypass grafting

(CABG) in octogenarians.

Methods: Retrospective cohort including all patients aged ≥ 80 years who underwent isolated CABG surgery in a single center, during a 10-year period. Descriptive statistics using absolute and relative frequencies, mean and standard deviations were used to sample characterization and multivariate cox regression was used to estimate independent predictors of survival. Mean follow-up time was 4 years, maximum 12.

Results: In the study period, 142 patients were octogenarians (mean age 82±2 years, maximum 88 y), 68% being male. The median EuroSCORE II was 4.2% (1.2 to 40.2). Arterial hypertension was the most frequent risk factor (86%) followed by dyslipidemia (58%) and diabetes (36%). Peripheral and cerebrovascular artery diseases prevalence was 19 and 9%, respectively. The mean creatinine clearance (CC) was low: 47.7 ml/min and 24% of patients presented moderate to severe left ventricular dysfunction. The majority of patients presented with class IV CCS angina (81%), 55% suffered a recent myocardial infarction (<90 days) and 79% underwent non-elective surgery. Regarding surgical data, 54% of surgeries were on-pump (cardiopulmonary bypass and aortic clamp times being 92±26 and 55±19 min, respectively). Sixteen percent of these patients receive bilateral internal mammary artery and the mean number of grafts was 2.4±0.8. Considering early outcomes, chest reexploration for bleeding was 1% and sternal refixation due to wound infection occurred also in 1%. Post-operative atrial fibrilation episodes occurred in 39% patients and 9% had prolonged ventilation time (>24h). Stroke and in-hospital death occurred in 4.2% and 3.5%, as predicted by the EuroSCORE II. The 1-, 3-, 5- and 12-year cumulative survival were 89%, 77%, 66% and 39%, respectively. Age was not an independent predictor of survival in this elderly cohort (HR: 1.17 95%CI: 0.97-1.39). Patients with severe renal impairment (CC < 50ml/min) were associated with worse prognosis (HR: 2.19, 95% CI: 1.07 – 4.52).

Conclusion: Despite the limitations regarding the retrospective nature of this study, CABG surgery seems to be safe and effective in octogenarian patients.

CO-08
AORTIC VALVE SURGERY IN OCTOGENARIANS

Renata Melo (Portugal)[1,2]; Soraia Moreira (Portugal)[1,2]; Francisca A. Saraiva (Portugal)[1,2]; Rui J. Cerqueira (Portugal)[1,2,3]; André P. Lourenço (Portugal)[1,2,4]; Mário J. Amorim (Portugal)[1,2,3]; Jorge Almeida (Portugal)[1,2,3]; Paulo Pinho (Portugal)[2,3]; Adelino F. Leite-Moreira (Portugal)[1,2,3]

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Background: The number of octogenarians referred to aortic valve replacement (AVR) is growing due to aging of population.

Aim: To evaluate early outcomes and survival after isolated or combined with other procedures AVR surgery in octogenarians.

Methods: Single-center retrospective cohort study including consecutive AVR surgery in octogenarian patients with last-generation bioprostheses implanted from 2009 to 2016. Absolute and relative frequencies and mean or median were used for sample characterization. Mid-term cumulative survival estimate was done using Kaplan-Meier curve. Median follow-up time was 28 months (maximum 91 months).

Results: We included 205 patients with mean age of 82±2 years, 55% being female. Median of EuroSCORE II was 4.3% (1.1 to 50.6), being significantly higher in patients with multiple procedures (n=106, 6.6% (2.0 to 50.6) vs. n=99, 2.8% (1.1 to 20.3), p<0.001). The most common risk factors were arterial hypertension (84.4%) and dyslipidemia (63.4%). Only 14.6% patients had history of smoking. During surgery two patients required intraortic balloon pump (IABP). In the immediate postoperative period, inotropic support (≥2 amines or IABP) was required in 47 (22.9%) patients and 12.4% needed prolonged ventilation (>24hours). De novo atrial fibrillation episodes occurred in 82 (51.3%) patients, and 8 (3.9%) patients suffered a clinically relevant stroke. Complete heart block occurred in 26 (12,8%) individuals and 11 (5.6%) required implantation of permanent pacemaker (for all cause). Worsening of renal function (postoperative 50% increase in basal creatinine levels) occurred in 9 (4.4%) patients. Median of hospital stay was 9 days (3 to 115 days). One patient underwent early reoperation (< 30 days post-implant) due to endocarditis. Intra-operative mortality was 0% and 30-days mortality 5.8% (3.0% vs. 8.5% in isolated vs. multiple procedures, p=0.096). The 1-, 3- and 5-years cumulative survival rates were 88%, 75% and 58%, respectively.

Conclusion: Our findings support the benefit of surgical AVR in octogenarians, considering the low incidence of complications and reasonable mid-term survival.

ORAL COMMUNICATIONS 2
Friday, November 23th, 6:00 p.m.

CO-09
CAN POST-CABG ATRIAL FIBRILLATION BE PREVENTED BY PREOPERATIVE BETA-BLOCKER?

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Background: Postoperative atrial fibrillation (PoAF) is the most common arrhythmia following cardiac surgery and has been associated with increased morbidity and mortality. Although beta-blocker therapy is recommended to prevent PoAF, the supporting evidence is poor.

Purpose: The aim of this study was to determine the effect of preoperative beta-blocker medication in PoAF incidence following coronary artery bypass grafting surgery (CABG), and its impact in long-term mortality.

Methods: Retrospective single-center study including consecutive CABG during a 5-year period. Patients with documented episodes of AF or pacing rhythm before cardiac surgery were excluded. Preoperative, surgical and postoperative data were collected through clinical files and informatic databases. Qui-square and independent t-tests were used to compare categorical and continuous data, respectively, between patients with and without PoAF. A multivariate logistic regression model was used to estimate the impact of pre-operative beta-blocker therapy in PoAF. Kaplan-Meier curves, Log Rank test and multivariate Cox regression were used to determine the effect of beta-blocker treatment in long-term survival. The mean follow-up time was 8 years, maximum 13.

Results: We included 1487 patients, mean age of 63±10 years, 79% being male. PoAF occurred in 255 patients (17%), 3±4 days after CABG, the majority pharmacologically cardioverted with amiodarone (95%). These patients were older (67±9 vs. 62±10 years, p<0.001), more frequently hypertensive (75% vs. 69%, p=0.004) and had lower preoperative creatinine clearance (CC, 73±28 vs. 81±28ml/min, p<0.001) and higher CHA2DS2–VASc score (2.97±1.68 vs. 2.61±1.56, p=0.001) compared with patients without PoAF. PoAF was determined as an independent predictor of mortality in multivariate cox regression (HR: 1.455, 95% CI: 1.120-1.890, p=0.005). In multivariate analysis, pre-operative beta-blocker therapy did not reveal a preventive effect in PoAF after CABG surgery (OR: 1.015, 95% CI: 0.627-1.642, p=0.952). Both univariate and multivariate analysis showed an improvement in cumulative survival with beta-blocker medication (13-years survival of 65% vs. 55%, Log-rank, p=0.005; HR 0.689, 95% CI: 0.522-0.909, p=0.008).

Conclusion: Although pre-operative beta-blocker therapy did not predict PoAF occurrence after CABG surgery in this retrospective cohort, it showed a significant prognosis benefit regarding long-term survival. Further prospective studies could better address the pathophysiology pathways underlying this positive impact.

CO-10
PROSTHESIS VERSUS XENOGRAFTS FOR SURGICAL TREATMENT OF ACTIVE ENDOCARDITIS

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

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Introduction: Infective endocarditis is a disease associated with high mortality rates. Despite advancements in medical and surgical therapies, this entity remains a challenge for cardiac surgeons. Timing for intervention and surgical approach are still topics of debate. Native and prosthetic valve endocarditis are 2 different subgroups that require differences in management. In ESC and AATS guidelines, it was defended the use of allografts and xenografts for aortic valve replacement in cases of active infection, with better results, especially with invasion of the aortic root in prosthetic valve endocarditis. The aim of our study is to compare early and late survival and complications between surgical options for active infective endocarditis of the aortic valve, in particular prosthetical valves versus xenografts.

Methods: We selected patients with active endocarditis of the aortic valve treated at our centre over the last 10 years (2008-2017). We divided the patients into 2 groups: those with prosthetic valve implantation (42 patients) and those with xenograft implantation (23 patients). We compared the 2 groups regarding different preoperative, intraoperative and postoperative characteristics using t-tests for continuous variables and Fischer exact tests for binomial and categorical variables. We used univariate and multivariate logistic regression to analyse different factors that could contribute to differences in survival. We performed survival

analysis and log-rank tests and constructed Kaplan Meier survival curves. We used STATA v14.2 for all the statistical analysis.

Results: There were no significant differences between the 2 groups regarding preoperative variables, in particular, gender, age, prevalence of cardiovascular comorbidities, kidney function, respiratory disease or EuroSCORE II values. Except for cardiac complications, that were superior in the xenograft group, there were no statistically significant differences between complication rates in the 2 groups. Survival at 30 days was significantly impacted by age (OR 0.765, p=0.027). Survival at 1 year was affected by the preoperative EuroSCORE II (OR 2.05, p=0.018). There were no significant differences between the 2 groups in terms of early and late survival, when controlling for native or prosthetic valve endocarditis. There were 10 in-hospital deaths (1 intraoperative), with the majority being of cardiac (5) and infective (3) causes.

Conclusions: We found no differences in early and late morbidity and mortality between the prosthetic valve group and the xenograft group. Regardless of native or prosthetic valve endocarditis, both options present similar results in early and late mortality, as well as similar rates of complications.

CO-11
COMPARISON BETWEEN TWO LAST GENERATION BIOPROSTHESIS IN THE APPROACH OF THE SMALL AORTIC ANNULUS.

Tiago Millner (Portugal)[1]; João Pedro Monteiro (Portugal)[1]; Sara Simões Costa (Portugal)[1]; Paulo Neves (Portugal)[1]; Daniel Martins (Portugal)[1]; Miguel Guerra (Portugal)[1]; Paulo Ponce (Portugal)[1]; Luis Vouga (Portugal)[1]

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Objective: Comparing the hemodynamic profiles of the Trifecta™ aortic bioprosthesis with glide technology (Trifecta GT™) sizes 19 and 21 with the Perceval™ aortic bio prosthesis (Perceval™) sizes S and M in their hemodynamic performance in patients who underwent surgical aortic valve replacement.

Methods: Data of patients that underwent aortic valve substitution using Perceval™ #S, Perceval™ #M, Trifecta GT™ #19 and Trifecta GT™ #21 between July 2016 and July 2018 in the department of Cardiothoracic Surgery of CHVNG/E were retrospectively compared in regard to their hemodynamic performance variables: peak transvalvular gradient and indexed aortic valve area. We excluded many patients using only echocardiographic data from our institution to guarantee for more precision of the hemodynamic data, and choose a 1 Perceval™ to 2 Trifecta GT™ analysis approach. The independent variables T test was used to search for statistical significance.

Results: Data of 54 patients were analyzed: 18 Perceval™ (13 size M and 5 size S) and 36 Trifecta GT™ (7 size 19 and 19 size 21). The hemodynamic data and post-operative clinical status were evaluated by transthoracic echocardiography and follow up visit respectively, in the frame of 3 to 12 months post-surgery. The mean peak transvalvular gradient and the indexed aortic valve area were 33.80 mmHg and 0.92 cm2/m2 for Perceval™ #S, 25.71 mmHg and 1.00 cm2/m2for Perceval™ #M, 20.40 mmHg and 0.92 cm2/m2 for Trifecta GT™ #19 ,21.90 mmHg and 1.00 cm2/m2 for Trifecta GT™ #21. There was no statistically significant difference in body surface area and left ventricular ejection fraction between groups. The difference in the peak transvalvular gradient was statistically significant for comparison of Perceval™ #S and Trifecta GT™ #19 ($p < 0.01$). No statistic significant differences were found in the peak transvalvular gradients between Perceval™ #M and Trifecta GT™ #21. No statistically significant differences were found concerning the indexed aortic valve area.

Conclusions: The hemodynamic performance of the Trifecta GT™ #19 seems superior to that of Perceval™ #S in this small population. The clinical relevance of this finding should be confirmed in a study with a bigger population, ideally randomized and prospective.

CO-12
VENO-ARTERIAL EXTRACORPOREAL MEMBRANE OXIGENATOR IN PATIENTS UNDERGOING TO URGENT HEART TRANSPLANTATION

Carlos Branco (Portugal)[1]; André Antunes (Portugal)[1]; David Prieto (Portugal)[1]; Manuel Batista (Portugal)[1]; Fatima Franco (Portugal)[1]; Pedro E Antunes (Portugal)[1]; Manuel Antunes (Portugal)[1]

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Introduction: Veno-arterial extracorporeal membrane oxygenation (VAECMO) is one of the methods of mechanical circulatory support in patients in cardiogenic shock who need urgent heart transplantation (HT). We aimed to show the center experience in heart recipients with preoperative VAECMO.

Methods: From November-2003 to December-2017,

353 patients were consecutive submitted to HT. From those 34% (n=121) had an urgent INTERMACS classification (1 to 3) and 66% (n=232) of the patients had an INTERMACS classification of 4 to 7. Four percent of the adult patients were in pre-transplantation VAECMO (n=14). Indication for VAECMO implantation was level 1 or 2 by the INTERMACS scale.

Results: Mean age of the recipients was 48±14.6 years, 57.1% were female, 35.7% were diabetic and 14.3% had peripheral vascular disease. The ischemic etiology accounted to 21.4% and dilated etiology to 42.9% of the patients. Mean pre-HT left ventricle ejection fraction was 21.9±9.1% and mean pulmonary vascular resistances were 2.4±1.7 WU. The duration of VAECMO prior to HT was from 8 hours to 42 days (mean of 10.6±10.5) and continuous hemofiltration was present in 28.6% of patients. Intraoperative weaning of VAECMO was only achieved in 14.3% of the patients and the majority of patients (64.3%) required prolonged inotropic support (>48h) after HT. A half of the patients died during hospitalization after HT with 3 (21.4%) of them died from multiorgan failure and 4 (28.6%) from infection. Survival at 1 and 3 years was similar and poor (40±13.9% and 40±13.9%, respectively).

Conclusion: with this study we show that the weaning proportion of VAECMO after HT is very low and in-hospital mortality was very high due multiorgan failure or infection. Long-term survival was also poor. Then, the decision to rescue the patient with VAECMO as a bridge to transplantation must be taken in highly selected cases.

CO-13

LOW VS. HIGH-GRADIENT AORTIC STENOSIS: CLINICAL RESULTS AND VENTRICULAR REMODELING AFTER AORTIC VALVE REPLACEMENT

Soraia Moreira (Portugal)[1,2]; Francisca A. Saraiva (Portugal)[1,2]; Rui J. Cerqueira (Portugal)[1,2,3]; Renata Melo (Portugal)[1,2]; André P. Lourenço (Portugal)[1,2,4]; Mário J. Amorim (Portugal)[1,2,3]; Jorge Almeida (Portugal)[1,2,3]; Paulo Pinho (Portugal)[2,3]; Adelino F. Leite-Moreira (Portugal)[1,2,3]

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Introduction: Low-gradient (LG) aortic stenosis (AS) is a very controversial and challenging entity due to the possible association with advanced stage disease and worse prognosis.

Aim: To compare clinical outcomes and left ventricular (LV) regression in individuals with severe AS (AVA <1 cm2 and AVAi <0.6 cm2) with LG (MTG <40 mmHg) and high-gradient (HG; MTG ≥40 mmHg) who underwent aortic valve replacement surgery (AVRS).

Methods: Retrospective cohort study including all individuals with severe AS with LG or HG who underwent AVRS with the latest generation of bioprostheses (Freedom Solo or Trifecta), between April 2009 and June 2016, in a central hospital. Pre- and post-operative clinical and echocardiographic data (postoperative TTE performed at 4±3 months) were collected. In February of 2017, mortality and need for reintervention were evaluated (mean follow-up time: 34 months, max. 94). Chi-square and t tests for independent samples were used to compare categorical and continuous variables between groups. Survival was assessed by Kaplan-Meier curves (Log-Rank test) and multivariate Cox regression.

Results: We included 418 patients, 74 (18%) LG and 344 (82%) HG, mean age of 75±7 vs. 75±6 years (p=0.614) and 61% vs. 47% being males (p=0.036), respectively. LG group showed a higher surgical risk (median EuroSCORE II 5.0 vs. 2.4, p <0.001) and a higher frequency of depressed ejection fraction (EF) (56 vs. 12%, p <0.001). LG group underwent multiple procedures more frequently (74 vs. 47%, p <0.001). However, no diferences were found regarding 30-days mortality in LG and HG groups (6.8 vs. 4.4%, p=0.381). In postoperative TTE there was a smaller regression of LV mass and a higher improvement in LVEF in LG group (6 vs. 11%, p=0.030, 10 vs. 1%, p <0.001, respectively). In stratified analysis by LVEF, cumulative survival at 40 months was significantly lower in LG vs. HG patients with preserved LVEF (72 vs. 84%, p=0.003) and was similar in LG vs. HG patients with reduced LVEF (62 vs. 56%, p=0.933). In multivariate analysis, considering only individuals with preserved LVEF, LG AS was found as an independent predictor of mortality (HR 2.8, 95% CI 1.4-5.6, p=0.004).

Conclusions: Considering individuals with preserved LVEF, the LG AS presents worse survival results. Preoperative LVEF was found as an effect modifier of the impact of type of AS in mid-term survival.

CO-14

MINI-STERNOTOMY VERSUS FULL STERNOTOMY AORTIC VALVE REPLACEMENT A SINGLE-CENTRE EXPERIENCE

Patrícia M. Castro (Portugal)[1]; Francisca A. Saraiva (Portugal)[1,2]; Rui J. Cerqueira (Portugal)[1,2,3]; Soraia Moreira (Portugal)[1,2]; Mário J. Amorim (Portugal)[1,2,3]; Adelino F. Leite-Moreira (Portugal)[1,2,3]; Filipe Macedo (Portugal)[1,2,4]

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Background: Full sternotomy (FS) is the gold standard approach to perform surgical aortic valve replacement (AVR). However, potential advantages of a less traumatic approach fomented the development of so-called minimally invasive procedures, which include upper mini-sternotomy (MS). Objective: To compare immediate postoperative clinical results and mid-term mortality after AVR through MS and FS.

Methods: Single-centre retrospective study including all patients who underwent isolated AVR through MS between January 1, 2011 and July 31, 2017. These were then matched with patients who underwent the same procedure through FS and by the same surgeons who performed MS, using coarsened exact matching for the variables age, gender, body mass index and diabetes mellitus. Groups were later characterized and compared regarding postoperative results using Qui-squared and Mann-Whitney tests and regarding mid-term mortality through Kaplan-Meier curves.

Results: We included 82 patients (n=41 in each group). Aortic cross clamp [78 vs. 63 minutes, p=0.001] and cardiopulmonary bypass times [107 vs. 90 minutes, p=0.002] were significantly longer in the MS group vs. FS group, respectively. Although without reaching statistical significant difference, a smaller percentage of patients from the MS group required red blood cells transfusions during surgery (39.0% vs. 53.7%, p=0.184). Similar results were found regarding mechanical ventilation, inotropic support, morphine infusion, intensive care unit length of stay and incidence of de novo atrial fibrillation. Cumulative survival at 6 years was 86.7% after MS and 88.5% after FS (p=0.650).

Conclusions: Aortic valve replacement through MS seems to be a safe alternative to the gold standard FS.

CO-15
NATIVE VALVE VS. PROSTHETIC ENDOCARDITIS

Sara Ranchordas (Portugal)[1]; Márcio Madeira (Portugal)[1]; Paulo Oliveira (Portugal)[1]; Marta Marques (Portugal)[1]; José Calquinha (Portugal)[1]; Miguel Abecasis (Portugal)[1]; Miguel Sousa Uva (Portugal)[1]; José Pedro Neves (Portugal)[1]

[1] Hospital Santa Cruz, CHLO

Introduction: Prosthetic valve endocarditis (PVE) is a rare but serious disease. Risk is higher in the first year after implantation and then decreases. Surgery should be considered when patients present with complications, persistent bacteraemia or relapse of infection.

Objective: Compare native valve (NVE) vs. PVE regarding preoperative status, lesions found and survival.

Methods: Analysis of all patients with endocarditis lesions at the time of surgery. A total of 90 cases were included between june 2014 and october 2017. Endocarditis was prosthetic in 22 (24%) of cases.

Pathological lesions were coded prospectively using the coding form suggested by Pettersson et al. Other data was collected retrospectively through consultation of clinical registries. Statistical analysis was performed with SPSS using the appropriate statistical tests (Chi-square and Fisher´s exact tests).

Results: Mean age of patients included was 60 years and 72% were male. Mean EuroScore II was 9.8%. PVE was early in 11 cases. Fifty patients (56%) were in heart failure class NHYA III/IV at the time of surgery. Embolic events were described in 37 (41%) cases– most frequently to the brain (21; 23%) and spleen (17; 19%). Pre-operative blood cultures yielded positive results in 64 patients (71%) - staphylococci being the most frequent (37%), followed by streptococci (20%). In the echocardiogram, vegetations were evident in 70 (78%) of cases, invasion in 20 (22%), and valve integrity anomalies in 27 (30%). In hospital mortality was 10%. When comparing NVE vs PVE no difference was found in preoperative status, such as embolic events, acute renal failure, NHYA class III/IV heart failure or shock. No statistically significant differences were found in isolated microorganisms. Invasion was more frequent in PVE (59% vs 10%, p <0.001 in echocardiogram, 68% vs 29%, p = 0.001 in surgery). Atrioventricular bundle destruction, although a rare lesion, was significantly more frequent in PVE (14% vs 1.5%, p =0.044). Presence of vegetations and valve integrity anomalies seen on echocardiogram are not different between groups. However, during surgery, vegetations (78% vs 50%, p=0.012) and valve integrity anomalies (87% vs 23%, p< 0.001) were more frequently described in NVE.

Early (<30days after surgery) (32% vs. 3%, p =0.001) and one year mortality (36% vs 13%, p =0.026) were higher in PVE.

Conclusion: Preoperatively, there were no significant differences in clinical status between NVE and PVE. Invasion is more frequently seen in PVE. Early and late mortality are also higher in PVE.

CO-16

SURGICAL LESIONS IN INFECTIVE ENDOCARDITIS: A PROSPECTIVE STUDY

Sara Ranchordas (Portugal)[1]; Márcio Madeira (Portugal)[1]; Paulo Oliveira (Portugal)[1]; Marta Marques (Portugal)[1]; Luís Baptista (Portugal)[1]; José Calquinha (Portugal)[1]; Miguel Abecasis (Portugal)[1]; Miguel Sousa Uva (Portugal)[1]; José Pedro Neves (Portugal)[1]

[1] Hospital de Santa Cruz, CHLO

Introduction: Infective endocarditis is a rare but potentially fatal disease. Pathologic lesions found during surgery are diverse. A standardized and systematized system to classify pathologic lesions could assist in the improvement of definite diagnosis, choice of treatment and consequent improvement of prognosis.

Objective: Register in a systematic and standardized coding form pathologic lesions found during infective endocarditis surgery. Evaluate predictors for early mortality.

Methods: Analysis of all patients with endocarditis lesions (active or remote) at the time of surgery. A total of 90 cases were included between june 2014 and october 2017. Pathological lesions were coded prospectively using a coding form suggested by Pettersson et al. Other data was collected retrospectively. Statistical analysis was performed with SPSS using the appropriate statistical tests.

Results: Mean age of patients included was 60 years and 72% were male. Mean EuroScore II was 9.8%. Endocarditis was prosthetic in 22 cases (24%). Fifty patients (56%) were in heart failure class NHYA III/IV. Embolic events were described in 37 (41%) cases– most frequently to the brain (23%). Pre-operative blood cultures yielded positive results in 64 patients (71%) - staphylococci being the most frequent (37%), followed by streptococci (20%). In echocardiogram, vegetations were evident in 70 (78%) of cases, invasion in 20 (22%), and valve integrity anomalies in 27 (30%). Endocarditis was active in 67 (74%) of cases. A summary of lesions described is presented in table. Periprosthetic leak was the prime lesion in prosthetic endocarditis. Valve culture was negative in 66 cases. Staphylococci were the most frequently identified (16%). In hospital mortality was 10%. In univariate analysis, high blood pressure, chronic kidney disease, NHYA III/IV heart failure at time of surgery, valve integrity anomalies (found during surgery), prosthetic endocarditis and redo surgery were significant predictors of early (<30 days) mortality.

Conclusion: Systematic coding of lesions found might be an important tool to improve management of this disease and harmonisation across centres allowing larger study populations.

Lesions		Vegetations		Invasion		Valve integrity anomalies	
Valve		n	%	n	%	n	%
Aortic valve	Right coronary cusp	23	26%			16	18%
	Left coronary cusp	24	27%			16	18%
	Non coronary cusp	26	29%			17	19%
	Total	40	44%	25	28%	33	37%
Mitral valve	Anterior leaflet	16	17.8%			13	15%
	Posterior leaflet	15	17%			14	16%
	Anterior Chords	3	3%			5	6%
	Posterior chords	3	3%			7	8%
	Total	30	33%	11	12%	30	33%
Tricuspid valve	Anterior leaflet	3	3%			4	4%
	Posterior leaflet	4	4%			3	3%
	Septal leaflet	4	4%			3	3%
	Total	8	8%			8	9%
Pulmonary valve	*Total*	1	1%			2	2%
Total		64	71%	35	39%	64	71%

SHORT COMMUNICATIONS
Friday, November 23th, 6:00 p.m.

CB-01
THE MID-TERM OUTCOMES OF NEONATAL AORTIC STENOSIS TREATMENT: A SINGLE CENTER STUDY

Rui Cerejo (Portugal)[1]; Carolina Rodrigues (Portugal)[1]; Manuela Silva (Portugal)[1]; José Diogo Martins (Portugal)[1]; Rui Rodrigues (Portugal)[1]; Fátima Pinto (Portugal)[1]; José Fragata (Portugal)[1]

[1] Centro Hospitalar Lisboa Central - Hospital de Santa Marta

Objectives: To evaluate treatment outcomes of surgical or percutaneous treatment of neonatal valvar aortic stenosis (AS).

Methods: Neonates with critical AS represent a challenging group of patients. Both percutaneous balloon valvotomy (BV) and open surgical valvuloplasty (SV) are established effective initial treatments. Relief of mechanical obstruction is the primary goal, but preservation of an acceptable function of the native aortic valve appears fundamental regarding long-term outcomes. All patients intervened during 2008–2018, who had an initial diagnosis of isolated neonatal critical AS, initially treated till 60 days of age and who survived the first procedure, were included in this unicentric retrospective study. Treatment outcomes were categorized into Optimal: residual gradient <40mmHg and trivial or no aortic regurgitation (AR), Adequate: gradient <70mmHg with moderate AR, or Inadequate: gradient >70mmHg and/or severe AR. Current information was available for 20 patients for a mean follow-up of follow-up of 10.56±7.93 years. Kaplan--Meier method was used to estimate freedom from reintervention.

Results: Patients underwent either SV (n=13) or BV (n=7) at a median age of 15 days of age (range 3 days to 60 days). After SV an acute optimal result was obtained in 3 (23.1%), adequate in 7 (53.8%) and inadequate in 3 (23.1%). Results of BV were: adequate in 5 (71.4%) and inadequate in 2 (28.6%). There were no late deaths. Eleven patients needed a second procedure for re-aortic stenosis (n=7) or aortic insufficiency (n=4), i.e., BV (n=4), valve replacement (n=3) or a Ross procedure (n=4). Five patients needed a third procedure and one patient needed a fourth intervention. Freedom from reintervention was 68%, 49%, and 16% at 5, 10, and 15 years, respectively. Type of first procedure (surgical vs percutaneous) did not influenced mid-term results, but achieving an optimal or adequate result on first procedure resulted in better reintervention free time compared with inadequate result (p=0,044).

Conclusions: Treatment for neonatal critical aortic stenosis, can be considered only palliative, as the majority of these patients will require more procedures during follow-up. Type of first intervention (surgical or percutaneous) didn't influence the mid-term results in our study. Achieving an optimal or at least an adequate result should be the goal of the index procedure in order for reintervention be delayed to allow implantation of an adult-sized prosthesis or a Ross later in life.

CB-02
SURGICAL TREATMENT OF ATRIAL FIBRILLATION: EARLY RESULTS OF A RENEWED SURGICAL PROGRAM

Rui Cerejo (Portugal)[1]; Carolina Rodrigues (Portugal)[1]; Manuela Silva (Portugal)[1]; Jorge Santos (Portugal)[1]; Nuno Banazol (Portugal)[1]; Rui Rodrigues (Portugal)[1]; José Fragata (Portugal)1 [1]

[1] Centro Hospitalar Lisboa Central - Hospital de Santa Marta

Objectives: To evaluate the early results of an Atrial Fibrillation (AF) ablation surgery program.

Methods: AF is the most common cardiac arrhythmia, and its prevalence is increasing at an alarming rate worldwide. It remains one of the major causes of stroke, heart failure, sudden death, and cardiovascular morbidity. Surgical ablation is currently considered an effective treatment for patients with AF, with recent international guidelines advocating it for patients with symptomatic AF be as stand-alone or concomitant surgery. Despite this, it is still underperformed in most centers. All patients submitted to some form of surgical AF ablation (concomitant or stand--alone) from March 2016 till September 2018 were included in this unicentric retrospective study. The indication for stand-alone surgery was symptomatic AF relapse after catheter ablation, and for concomitant surgery, symptomatic AF associated with structural heart disease. Cryoablation was used in open-right or left atrium surgery and radiofrequency in the other cases. The main primary outcome was establishment and duration of sinus rhythm in the course of follow-up. Mortality and morbidity (stroke, pace-maker implantation) were assessed.

Results: Thirty patients with mean age of 60.7 years (36-75years) were submitted to surgical AF ablation. AF type was paroxysmal in 12 (40.0%), persistent in 4 (13.3%) and long-standing persistent in 14 (46.7%). Stand-alone AF ablation surgery was performed in 11 patients (36.7%) and in 19 patients (63.3%) was associated with concomitant

procedures: mitral surgery (n=8), tricuspid surgery (n=3), aortic valve surgery (n=3), CABG (n=2) and double valve surgery (n=3). Regarding complications: two (6.7%) definitive pacemaker implantations were needed and one (3.3%) early death was observed. There were no strokes or late mortality. Sinus rhythm at hospital discharge was present in 25 patients (86.2%). After 6 months 82.6% were in sinus rhythm. Fifteen patients had a Holter or longer event monitors (mean 10 months post-operative) and 80% had no evidence of AF.

Conclusions: Surgical AF ablation is a safe procedure with better results compared with those reported for catheter ablation. We demonstrate that even in an initial phase of a surgical program, results are satisfactory and encouraging. Finally, surgical AF ablation is still an underused procedure which has to grow to keep up with demand of AF treatment.

CB-04

TRANSAPICAL OFF-PUMP MITRAL VALVE REPAIR WITH NEOCHORDOPLASTY – INITIAL EXPERIENCE IN PORTUGAL

Sara Simões Costa (Portugal)[1]; João Pedro Monteiro (Portugal)[1]; Tiago Millner (Portugal)[1]; Paulo Neves (Portugal)[1]; Daniel Martins (Portugal)[1]; Nelson Santos (Portugal)[1]; José Ribeiro (Portugal)[1]; Pedro Braga (Portugal)[1]; Luis Vouga (Portugal)[1]

[1] Centro Hospitalar Vila Nova de Gaia/Espinho

Introduction: Transapical off-pump neochordoplasty repair is a minimally invasive surgical procedure, to treat degenerative mitral valve regurgitation, of increasing interest. It has been demonstrated to be safe and effective in selected patients. The procedure is performed using the NeoChord DS1000™ system under 2D and 3D transesophageal echocardiographic (TEE) guidance on a beating heart. The aim is to demonstrate the safety and feasibility of the surgical technique and our short-term results for mitral valve repair using the NeoChord DS1000™ system.

Methods: Between December 2017 and August 2018, 8 patients underwent transapical off-pump mitral valve repair with neochordoplasty. The procedure was performed by left minithoracotomy, under general anaesthesia, using 2D and 3D TEE guidance. All patients presented with severe primary mitral regurgitation due to flail/prolapse of 1 leaflet (anterior or posterior). Primary end points were freedom from mortality, myocardial infarction, stroke, reintervention and recurrence of severe mitral regurgitation. Also, we analyzed baseline and postoperative transthoracic or transesophageal echocardiography, comparing grading of mitral regurgitation, left ventricle indexed end diastolic volume and ejection fraction.

Results: The average age was 61 years, 6 patients were male and their mean EuroSCORE II was 1.1. Median ICU and hospital stay was 1 and 3 days, respectively. All procedures were uneventful and there were no major complications. Successful repair, resulting in trace or mild mitral regurgitation, was achieved in all 8 patients, by implantation of 2 to 4 neochordae. At 3 to 5 months follow-up, 7 patients presented trace to mild mitral regurgitation, while 1 patient had moderate mitral regurgitation, due to extreme left ventricular volume reduction. There was a trend towards left ventricular reverse remodeling in all patients, with reduction of indexed left ventricle end diastolic volume. All patients were in NYHA class I or II and there was no need of reintervention, so far.

Conclusions: In select patients, mitral valve repair using the NeoChord DS1000™system, which allows both implantation and later lenght adjustment of artificial chordae, is safe, effective and reproducible.

CB-05

CENTRIMAG® VENTRICULAR ASSIST DEVICE RESULTS AS A BRIDGE TO RECOVERY OR TO TRANSPLANT

Tiago Pinto Silva (Portugal)[1]; Pedro Coelho (Portugal)[1]; Paulo Franco (Portugal)[1]; Rui Rodrigues (Portugal)[1]; José Fragata (Portugal)[1]

[1] Centro Hospitalar Lisboa Central - Hospital de Santa Marta - Departamento de Cirurgia Cardiotoracica

Introduction: CentriMag® is an extracorporeal short-term circulatory assist device, whose main component is a magnetically levitated rotor, so that frictionless rotation may be achieved thus avoiding regions of stasis, wear or tear. Its use is indicated as a bridge to recovery or as a bridge to transplant. In Europe it is licensed for a period up to 30 days.

Objectives: Analysing our results with CentriMag® circulatory system devices.

Methods: Retrospective analysis of 15 patients, from 2015 to 2018, who were supported with CentriMag® circulatory system in our unit.

Results: Our fifteen patients were 10 adults and 5 children. The adults, with a medium age of 50,4 years, received CentriMag® devices, during an average time of 19 days, for left ventricular support; indications were post myocardial infarction cardiogenic shock (n=3) and refractory heart failure (n=7); 6 (60%) patients were transplanted, 3 (30%) died (2 on support and 1 after recovery) and one patient is still on circulatory assistance. The 5 children who received left

ventricular assistance had a medium age of 8,4 years and two of them needed an upgrade to biventricular support; their mean duration of support was 11,6 days; indications were post extracorporeal circulation heart failure (n=2) and refractory heart failure (n=3); in this group, 3 (60%) patients were transplanted, 1 (20%) recovered and had the device explanted, while 1 (20%) died. Overall, 10 (66,7%) out of the 15 patients had a successful recovery or received a transplant.

Conclusions: In our experience CentriMag® can be used in heart failure as bridge to transplant or to recovery in adults and in children with good results.

CB-06

HEARTMATE 3®: DESTINATION THERAPY IN CASES OF END-STAGE HEART FAILURE

Tiago Pinto Silva (Portugal)[1]; Pedro Coelho (Portugal)[1]; Paulo Franco (Portugal)[1]; Valdemar Gomes (Portugal)[1]; José Fragata (Portugal)1

[1] Centro Hospitalar Lisboa Central - Hospital Santa Marta - Departamento de Cirurgia Cardiotoracica

Introduction: Heartmate 3® is a new generation Left Ventricular Assist Device (LVAD) for end-stage heart failure (NYHA stage IV) in patients who are not candidates for heart transplant. This therapy has been proven to improve patients' quality of life with reduced adverse events when compared with another devices.

Objectives: Report our experience with the Heartmate 3® device.

Methods: Retrospective analysis of 2 patients, who were treated with a Heartmate 3® device.

Results: The first patient treated with HeartMate 3® was a 65 years old man with the main diagnosis of dilated myocardiopathy with bad systolic function of the left ventricle (ejection fraction of 15-18%) and a chronic kidney disease in pre-dialysis stage. He was submitted to LVAD implantation in March 2017 without intra-operatory intercurrences. During the first post-op days, the patient needed re-exploration due to bleeding. He was discharged 58 days later. Afterwards, the patient started dialysis and needed three hospitalisations related to its management, one for epistaxis control and another caused by drive-line wound infection; the average hospitalization time was 30 days. The second patient was a 51 years old man with ischemic cardiopathy (NYHA IV), left ventricle dysfunction (ejection fraction of 29%) and right ventricle dysfunction. He was implanted with Heartmate 3® in August 2018 without intra-operatory complications. In the early post-op period, the patient had a recurrent pleural effusion and needed extended aminergic support related to his right ventricle dysfunction. He was discharged after 59 days of hospitalisation, 26 of them at the ICU. Nowadays, both patients are alive and are being followed up through periodical medical appointments.

Conclusions: Our experience and results with HeartMate 3® are positive. However, they constitute a difficult subset of patients with many comorbidities, prone to serious post-operative complications and dependent on extended clinical monitoring.

CB-07

TOTAL AORTIC ARCH REPLACEMENT WITH E-VITA OPEN PLUS™ HYBRID PROSTHESIS – INITIAL EXPERIENCE FROM A SINGLE SURGICAL CENTER

Tiago Millner (Portugal)[1]; João Pedro Monteiro (Portugal)[1]; Sara Simões Costa (Portugal)[1]; Paulo Neves (Portugal)[1]; Paulo Ponce (Portugal)[1]; Luis Vouga (Portugal)[1]

[1] Centro Hospitalar Vila Nova de Gaia/Espinho

Introduction: Complex pathology of the Thoracic Aorta constitutes a challenge, needing a complex and multidisciplinary approach. E-vita Open Plus™ prosthesis is a hybrid stent-graft system, used in the treatment of Aortic dissections Stanford type A, Complex Stanford type B, Aortic arch aneurisms and chronic extensive thoracic aortic dissections.

Methods: Presenting the initial experience of our department in the use of the E-vita Open Plus™ in the treatment of complex thoracic aortic aneurism encompassing the aortic arch. Between February 2017 and October 2018, 5 patients underwent E-vita Open Plus™ implantation in our department. Surgery was performed with cardiopulmonary bypass (CPB), total circulatory arrest, moderate hypothermia, Bretscheider's HTK antegrade cardioplegia, selective antegrade brain perfusion and noninvasive neuromonitoring. This method made it possible to approach ascending aortic and aortic arch pathology and descending aortic pathology in a one stage procedure.

Results: The median age of the patients was 56,25, 3 males and 2 females. Diagnosis: Chronic Stanford type A aortic dissection; ascending aorta, aortic arch and right subclavian artery aneurism in tertiary syphilis; aortic arch aneurism. All where elective procedures: 2 reoperations (20%) and 4 (80 %) with concomitant aortic valve substitution, aortic prosthesis substitution and extra-anatomic bypass of aorta to right subclavian artery and right carotid artery, tricuspid valve repair. Median CBP, artic cross clamping and circulatory arrest times where 217, 87 and 71 minutes respectively. There was

no in-hospital mortality or morbidity. After discharge morbidity: Endoleak type III with TEVAR correction with subsequent low flow type II endoleak; pericardiocentesis for pericardial effusion. In all patients there was a reduction of aneurism sac size and positive aortic remodeling and all where asymptomatic in regard to cardiovascular symptoms.

Conclusions: The use of E-vita Open Plus™ seems a safe and efficient option for patients with complex aortic arch pathology, providing for a technically easier surgery in comparison to the conventional prosthesis. In the short follow-up period all patients were asymptomatic.

CB-08

MEASUREMENT OF THE REPRODUCIBILITY OF THE ANTICIPATED HEMATOCRIT FORMULA IN CARDIOPULMUNAR BYPASS

Hélder Santos (Portugal)[1]; Antonio Ribeiro (Portugal)[2]; Ana Filipe (Portugal)3; Clara Rocha (Portugal)[1]

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Introduction: In the course of cardiac surgery using extracorporeal circulation in order to avoid cellular hypoxia, excessive hemodilution and prevent unnecessary blood transfusions. In order to calculate the anticipated hematocrit is used a pre-stipulated formula. However, this formula does not include some physiological parameters that can influence the concentration of sanguineous cells, leading to erroneous results.

Objectives: Check if the formula for the calculation of the anticipated hematocrit is correct or if there is any deviation between the calculated values and the values measured in the blood gases during cardiopulmonary bypass.

Methods: The sample obtained is composed with a total of 500 peoples. The data were obtained through the consultation of each surgical intervention protocols using cardiopulmonary bypass. Subsequently, the HCT anticipated predicted for the patient was calculated and the results obtained were compared.

Results: In this study, a predominance of males (67%) was observed. The difference between the HCT calculated by the formula and the actual HCT was statistically significant ($p < 0.001$), with an overestimation of the value by the formula (82,8%). This overestimation was more pronounced in the group of mitral valvulopathies with a mean difference of values of 4,947 ± 2,348%, $p < 0.001$. Considering the body surface area, significant differences were found in the overweight group (3,888 ± 2,906%, $p < 0.001$). According to the creatinine values, the differences were more significant in the patients without criteria for renal dysfunction (3,603 ± 3,224%, $p < 0.001$). Considering all the variables under study, the formula was reformulated in an attempt to make it more reliable (Formula B). A significant difference was observed however this difference was smaller than that obtained by the original formula (1.756 ± 3.574%, $p < 0.001$).

Conclusions: All the experimental calculations performed throughout this project still present statistically significant differences, however, comparing the results to those of the original formula, these differences are smaller.

CB-09

A RARE FINDING BEHIND PULMONARY HYPERTENSION: PRIMARY INTIMAL SARCOMA OF THE LEFT ATRIUM

João Adriano Sousa (Portugal)[1]; Diogo Rijo (Portugal)[1]; António Brazao (Portugal)[1]; Nuno Jardim (Portugal)[1]; Décio Pereira (Portugal)[1]; Susana Gomes (Portugal)[1]; Andreia Pereira (Portugal)[1]; Joao Manuel Rodrigues (Portugal)[1]

[1] Hospital Dr. Nélio Mendonça

Introduction: Cardiac tumours remain a rare clinical entity, often requiring a complex approach and multimodality imaging for their differential diagnosis.

Case report: A 51-year-old female patient, with no previous medical history, was referred to our outpatient clinic after 6 months of increasing dyspnea on physical exertion and intolerance to daily-life activities. Patient denied non-cardiovascular clinical symptoms. Physical examination revealed tachypnea, dyspnea during speech, SpO2 91% on room air and fine basal crackles on lung auscultation. ECG was normal. Transthoracic echocardiogram found a right ventricle enlargement, flattening of the interventricular septum (right ventricular overload), pulmonary arterial pressure over 100 mmHg and a giant cardiac mass attached to left atrium was found obstructing the diastolic filling of the left ventricle. The patient was admitted in our cardiology department for further investigation and a transesophageal echocardiogram followed, supporting the previous findings: a giant, heterogeneous mass with central areas of necrosis, multiple attachment sites and infiltrating the right pulmonary veins. Thoracoabdominal and pelvic CT staging, supported the previous findings and was negative for metastases, thus as an extracardiac primary tumor with cardiac metastization seemed unlikely. After heart team discussion, the patient was submitted to cardiac surgery. The tumour was removed

under cardiopulmonary bypass and cardiac arrest. The postoperative period had no major complications. Patient was discharged with no signs of pulmonary hypertension or residual cardiac mass tissue, evaluated by echo. Histopathological and immunohistochemical testing, revealed a highly aggressive intimal sarcoma, with MDM2 expression. Two months after discharge, complementary PET scan showed no signs of tumoral activity. Genetic testing is underway.

Discussion: The low prevalence and heterogeneous clinical presentation make the diagnosis of cardiac tumors difficult. They may remain assymptomatic until obstruction of cardiac chambers occurs causing heart failure. Primary malignancies of the heart are rare, and among those, sarcomas are the most prevalent. Intimal sarcoma (IS) is extremely rare in the heart, more commonly encountered in large arterial blood vessels. Multimodality imaging and Heart Team discussions is of utmost importance for early diagnosis and treatment, as early surgery may have prognostic and therapeutic implications. Although underrepresented in the literature, prognosis seems poor, even when achieving negative resection margins, with local recurrence and metastasis occuring frequently and median survival ranging from 3 to 12 months. To our knowledge less than 10 cases have been reported to date. Genetic markers are expected to provide new molecular insights into the pathways and treatment options behind IS.

CB-10
ANESTHETIC MANAGEMENT IN A TRANSCAVAL ACCESSED TRANSCATHETER AORTIC VALVE IMPLANTATION – A CASE REPORT

Sofia Ferraz (Portugal)[2]; Filipa Carvalho (Portugal)[1]; Pedro Braga (Portugal)[1]; Ana Fonte Boa (Portugal)[1]

[1] Centro Hospitalar Vila Nova de Gaia e Espinho; [2] Centro Hospitalar de São João

Introduction: Transcatheter aortic valve implantation (TAVI), in case of excessive calcification or stenosis of the iliofemoral arteries can be performed with a novel transcaval approach associated with less hazards (1,2). The anesthetic management in a TAVI is controversial and no consensus are yet available (3-5). Previous studies showed no significant short-term difference comparing monitored anesthetic care (MAC) vs general anesthesia (GA) (6).

Objective: Report the anesthetic management of a patient submitted to a TAVI CoreValve® by transcaval access.

Clinical-case: A 79-year-old male patient, ASA IV, with history of chronic obstructive pulmonary disease GOLD B, atrial fibrillation with hypocoagulation, chronic anemia, obesity, hypertension, diabetes mellitus and severe aortic valve stenosis, with preserved ejection fraction, was proposed to a TAVI due to high-surgical risk (Euroscore II tool 7.73%). Echocardiographic evaluation reported severe aortic stenosis, with mean pressure gradient of 60 mmHg and aortic valve area of 0.7 cm2, with mild insufficiency and severe pulmonary hypertension, with a SPAP measurement of 58 mmHg. Pre-surgically, the patency of the iliofemoral arteries was accessed – standard access to the procedure – revealing severe bilateral calcification. A transcaval approach was decided. Anesthetically, the patient underwent local anesthesia with lidocaine and moderate sedation with propofol perfusion and target-controlled infusion with remifentanil, maintaining spontaneous ventilation. The patient was monitored according to ASA standards II added to cerebral oximetry with INVOS™. During the procedure, overdilation of the new valve and a transesophagic echocardiogram (TEE) were performed registering no hemodynamic instability or other intercurrences.

Discussion: This surgical team first TAVI with transcaval approach, raised the concern of the pertinence of submitting the patient to GA, considering its learning curve. The need to perform a TEE during the procedure may also influenced the decision to submit the patient to GA or at least to deep sedation, since it induces nociceptive stimulation and ventilatory and hemodynamic alterations. MAC with or without conscious sedation is feasible and safe (7,10) with a meta-analysis suggesting its association with reduction of the procedural time, shorter hospital stays (6) and technical preferrance by the surgical team.

Conclusion: The anesthetic management of novel techniques involve new risks and considerations. The present case is relevant because it emphasizes the need to adapt the anesthetic regimen to the patient's clinical profile and the technical characteristics of the new procedure. We hope to contribute to highlight a possible and less invasive anesthetic approach. More studies regarding the appropriate anesthetic approach should be promoted.

CB-12
ISOLATED RIGHT ATRIAL METASTASIS FROM HEPATOCELLULAR CARCINOMA

João Pedro Monteiro (Portugal)[1]; Sara Simões Costa (Portugal)[1]; Tiago Millner (Portugal)[1]; Diogo Rijo (Portugal)[1]; Paulo Neves (Portugal)[1]; Rodolfo Pereira (Portugal)[1]; Fátima Neves (Portugal)[1]; Luís Vouga (Portugal)[1]

[1] Centro Hospitalar de Vila Nova de Gaia/Espinho

Cardiac metastasis from hepatocellular carcinoma are very rare (0.67-3%), have terrible prognosis, even with resection, and may lead to lethal perioperative complications. We report an unusual case of a 78-year-old man with past medical history including hypertension, alcoholism, liver cirrhosis and a 7 mm hepatic nodule under study, who presented to the hospital with manifestations of congestive heart failure (peripheral oedema and loss of appetite). Transthoracic echocardiography, showed a huge heterogeneous mass in the right atrium causing flow obstruction to the right ventricle. He was transferred to our department, hemodynamically unstable, and thus, underwent emergent surgical exploration which found a massive mass occupying most of the atrium, attached to the atrial wall and lateral wall of the inferior vena cava and protruding through the tricuspid valve. The tumour was successfully ressected using cardiopulmonary bypass and 6-minute hypothermic circulatory arrest. Histological examination revealed a hepatocellular carcinoma metastasis. Hospital stay was uneventful with discharge on the 7th postoperative day. At 2-year follow-up, the patient is asymptomatic, with no signs/symptoms of cardiac insufficiency, and cardiac ultrasound showing no tumour recurrence and no valvular dysfunction.

THORACIC SURGERY

ORAL COMMUNICATIONS & SHORT COMMUNICATIONS

SHORT COMMUNICATIONS

Friday, November 23th, 6:00 p.m.

CT-01

USEFULNESS OF SURGICAL LUNG BIOPSY IN INTERSTITIAL LUNG DISEASE: RETROSPECTIVE ANALYSIS

Margarida Afonso (Portugal)[1]; Carlos Branco (Portugal)[2]; Rita Pancas (Portugal)[2]; João Bernardo (Portugal)[2]

[1] Serviço de Pneumologia A - Centro Hospitalar e Universitário de Coimbra; [2] Centro de Cirurgia Cardiotorácica - Centro Hospitalar e Universitário de Coimbra

Introduction: The diagnosis of interstitial lung disease is usually obtained by multidisciplinary integration of a detailed clinical examination, auto-immunity, bronchoalveolar lavage and high-resolution CT. In many cases, this does not allow for a confident diagnosis and surgical lung biopsy (SLB) is recommended. However, SLB is associated with significant risks and costs, so it's role and utility in the diagnosis of ILD has been questioned. Our aim was to assess the utility of SLB in ILD cases with diagnostic doubt.

Methods: Retrospective analysis of patients from a single centre submitted to SLB for ILD diagnosis over 5 years. We collected data on epidemiology, clinical examination, complementary tests, surgical procedure and complications. A comparison between presurgical diagnostic hypothesis and the final diagnosis following multidisciplinary integration of SLB results was also performed.

Results: A total of 77 patients were identified, 38 males and 39 females, with a mean age of 54±15 years. Most were ASA 0 (78%), the remaining ASA 1. The main complains were cough in 58, shortness-of-breath in 28, sputum in 17, systemic complaints in 17 and chest pain in 5. Mean duration of symptoms before SLB was 17 ± 34 months. The majority, (66%) were never smokers, 27% were ex-smokers, and 6% were active smokers. Mean lung functions values were FEV189±20%, FVC 89±20%, TLC 91±19%, DLCO-SB 69±25%. Regarding medications, 18 were on steroids, 5 immunosuppressants, 4 anticoagulants and 9 on antiplatelets. Before surgery, all patients had bronchoscopy with BAL, 21 with transbronchial biopsies, one mediastinoscopy and five CT-guided biopsies. The majority (52%) had one sample collected, 44% had two, and 4% had three, predominantly (86%) on the right lung. The majority had open biopsy (91%) and 9% had VATS. Histological results confirmed the diagnostic hypothesis in 26 patients, changed the diagnosis in 38, and establish a diagnosis (no defined hypothesis) in 13. The two last groups led to changes on disease management. Minor postoperative complications were observed in four patients, three cases of electrolytic unbalance and one residual pneumothorax, treated conservatively. No major or late complications occurred.

Conclusion: In our population SLB was safe and secured a confident diagnosis in all patients. Importantly, SLB led to changes in diagnosis in the majority of cases. This data, reinforces the value of SLB following a multidisciplinary discussion of clinical and imaging data.

CT-02

EX VIVO LUNG PERFUSION: A CASE REPORT

Cândido Cerca (Switzerland)[1]; Vitor Mendes (Switzerland)[1]

[1] Centre Hospitalier Universitaire Vaudois – CHUV

Introduction: Donor lung shortage has been the main reason to the increasing number of patients waiting for lung transplant. Ex vivo lung perfusion (EVLP) is widely expanding technology proposed for the assessment, reconditioning and preservation of donor lungs previously unacceptable for transplantation.

Goal: We report a successful bilateral lung transplantation after donor lung assessment and treatment with the EVLP.

Methods: A 21-years-old female suffering from mucoviscidosis homozygote F 508 oxygen-dependent, was admitted in our hospital due to symptomatic acute respiratory decompensation. She was listed as high urgency for lung transplant and putted on V-V ECMO as bridge to therapy.

One day later, we were advised that there was a lung donor compatible with our patient, but the lungs were of marginal quality. We decided to treat this graft with the EVLP and, 4 hours after therapy, we decided proceed to a bilateral lung transplant in our patient.

Results: The donor was a 49-year-old female drown in lake, with hypoxic brain damage at 5 days of mechanical ventilation. The CT scan showed atelectasis of the 2 lower lobes and bilateral pleural effusion. At the time of retrieval both lower lobes showed a good re-ventilation, however with some oedema at the bases. The PaO2/FiO2 was 270 mm Hg. The lungs were accepted for EVLP therapy. Acellular normothermic EVLP was performed, using the Steen® solution. After 4 hours of therapy, we observed a good compliance without diminution of ventilatory exchanges. So, we decided to graft the lungs. A sequential bilateral lung transplant was

performed using the clamshell incision, on V-A ECMO. After the implantation, both lungs showed a good re-ventilation and the V-A ECMO could be weaned. There was a major bleeding during the surgery. Due to hemodynamic and ventilatory instability at the closure of the thoracotomy and considering the diffuse bleeding, we decide to leave the thorax open with a packing. The patient was transferred to the ICU under NO 20 ppm. Thoracotomy was closed 4 days later without complications. Post-operative course was complicated by post-transplant lymphoproliferative disease. Mechanical ventilation was weaned at 2 weeks after transplant. Patient discharged home at 3 months.

Conclusion: This technique makes it possible to select, among the marginal grafts, those which - after reconditioning by EVLP - meet the conventional criteria for implantation. EVLP is showing potential to substantially increase the availability of suitable donor lungs and push the limits of organ acceptability.

CT-03
SURGERY FOR SMALL CELL LUNG CANCER: EARLY EXPERIENCE

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

[1] Serviço de Cirurgia Torácica, Hospital Pulido Valente – CHLN, Lisboa

Introduction: Small cell lung cancer (SCLC) remains a major health problem accounting for 10 to 15% of all lung cancers. It represents approximately 4% of cases presenting as a solitary nodule.

SCLC is one of the most aggressive cancers, with more than 60% staged as extended disease at diagnosis. Stage I disease is diagnosed in less than 5% of the patients.

Historically, surgical treatment was not considered to be an option for early stage SCLC. However, according to present international guidelines, some studies report a five-year survival rate of 50% in stage I patients who underwent surgical resection.

Methods: We have conducted a review of lung cancer anatomical resections with curative intent performed in the period between January 2012 and August 2018. Patients with SCLC diagnosis were selected and the cases were reviewed.

Discussion: In a total of 898 lobectomies performed along the reviewed time, five had either a pre or post-operative diagnosis of SCLC. All of the five cases took place in the last 12 months.

The diagnosis was obtained previously to lobectomy in two cases, one by transthoracic needle aspiration (TNA) and the other by wedge resection. Both were stage I SCLC patients. In the patient which the diagnosis was made by TNA the final pathology analysis revealed giant cell neuroendocrine carcinoma.

Two patients had lobectomies for central lesions. Definitive pathology analysis demonstrated stage I SCLC.

One patient underwent lobectomy after intraoperative frozen section suggesting a non-small cell neuroendocrine tumor. Once more, final pathology analysis revealed stage I SCLC.

A left upper lobectomy was conducted in three patients, left lower lobectomy in one and right upper lobectomy in other. Systematic lymphadenectomy was conducted in all cases.

Chemotherapy was applied as adjuvant treatment in the 4 patients which final pathology exam confirmed SCLC.

At the time of this review, all patients are alive and without evidence of recurrence.

Conclusions: Surgical treatment can be an important treatment option for early stage SCLC patients as part of a multimodal approach, despite having a worse prognosis in comparison with NSCLC.

Staging of SCLC by TNM has helped to change mentalities and look at this entity as a localized disease, in its early stage, raising the awareness of the curative potential of surgical resection, and thereby increasing the number of patients referred for surgery.

CT-04
CATAMENIAL PNEUMOTHORAX: ASSEMBLING THE PUZZLE.

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

[1] Thoracic Surgery Department, Hospital Pulido Valente – CHLN, Lisboa

Introduction: The thoracic cavity is the most frequent extra-pelvic location of endometriosis, commonly presenting as pneumothorax. Catamenial pneumothorax (CP) is defined as a spontaneous secondary pneumothorax that occurs in women of reproductive age with a temporal relationship with menses.

Apart from constituting a rare entity, the diagnosis of CP is not straightforward and the standard management has not been clearly established. Despite this lack of consensus, post-surgical hormonal therapy with gonadotrophin-releasing hormone (GnRH) analogue for 6-12 months has been advocated.

Methods: We retrospectively analysed all patients with surgically treated CP in our department from January 2004 until September 2018, with special attention to clinical features, type of surgery and recurrence rates.

Results: Fifteen women, with a median age of 36,3 years, presented with CP. This entity was right-sided in all patients, with a mean of 2.7 episodes per patient. The mean follow-up time was 40,5 months. Only 4 (26.7% %) patients described a clear association with menses. A clinical relationship with pelvic endometriosis was evident in a total of 8 patients, and half of these cases were diagnosed subsequent to the episode of CP. Video-assisted thoracoscopy (VATS) was the surgical approach of choice, with multiple combinations performed. The most common procedure was pleurectomy with talc pleurodesis in 7 women. Only one case required conversion to an open approach with mini-thoracotomy. The characteristic lesions most commonly found were diaphragmatic defects (fenestrations) in 14 patients (93,3%), single or multiple with variable diameter. Five showed pleural implants, ultimately revealing endometrial tissue in 60% of the cases. One patient revealed partial intrathoracic liver herniation and was submitted to diaphragmatic repair with mesh coverage. Nine patients experienced recurrence, with 8 needing re-operation. During the total time period there was no mortality. GnRH analogues were initiated right after surgical approach in thirteen of our patients. During follow-up, two of the women experienced pregnancy without further CP episodes.

Conclusion: In conclusion, due to its complexity and clinical behaviour, CP is underdiagnosed and presents a high rate of recurrence. The use of VATS allows for both diagnosis and treatment. Even though the surgical treatment is essential in reducing the recurrence rate, the hormonal suppression therapy must also be introduced immediately after surgery. Therefore, it is clear that these patients benefit from a multidisciplinary team.

CT-05

THYMECTOMY FOR THYMIC NEOPLASMS: IS THERE AN ASSOCIATION WITH AUTO-IMMUNITY? – A SINGLE CENTER EXPERIENCE

Joana Rei (Portugal)[1]; Susana Rei (Portugal)[1]; José Miranda (Portugal)[1]; Miguel Guerra (Portugal)[2]; Pedro Fernandes (Portugal)[1]

[1] CHVNGE; [2] CHVNGE, FMUP

Introduction: Thymic neoplasms constitute a broad specter orf rare diseases, with unpredictable behaviour, ranging from indolence to highly aggressive tumours. An association with auto-immune diseases, especially miastenia gravis, has been long reported, although no clear cause has yet been found. The gold-standard for treatment of thymic malignancies is surgery, either through median sternotomy, minimally invasive sternotomy or, most recently, videothoracoscopy.

The main goal of this study is to evaluate the association between thymic malignancies and autoimmune diseases in patients submitted to thymectomy at our centre.

Materials/methods: We retrospectively reviewed all cases of thymectomy performed at our institution – Centro Hospitalar Vila Nova de Gaia/Espinho, EPE – since April 2007 until August 2018. Cases in which histological analysis revealed non-thymic neoplasms were excluded. Demographic characteristics, comorbidities and histological diagnosis were registered. Staging according to OMS, Masaoka and recent TNM staging systems for thymic malignant neoplasms was assessed. Surgical approach and post-operative outcomes were also recorded.

Results: A total of 102 thymectomies were performed during our study's timespan, 62 of which due to thymic neoplasms and were included in our study. An equal male:female ratio was found, with ages ranging from 18 to 89 years (m=55,1, SD=15,7). Almost 50% of patients presented with a thymoma, 11 with thymic hyperplasia, 5 with epithelial carcinoma, 12 with thymic cysts and 3 with thymolipomas. Patients with thymic carcinoma and thymoma were older than those with benign thymic neoplasms, although this association was not statistically significant (p=0,972). Twenty patients (32,3%) had a concomitant diagnosis of an autoimmune disease (chi square: p>0,05), 10 of which suffered from miastenia gravis. Nine patients developed unrelated malignant neoplastic diseases during the follow-up period. Auto-immunity was more frequent in the thymoma and thymic hyperplasia groups, where tumours seemed to be less aggressive according to the WHO classification.

Only 3 patients suffered from disease reccurence and 4 developed distant organ metastasis. No peri-operative mortality was found. Mean length of stay was of stay was of 4,47 days. No difference in LOS was found between patients submitted to total sternotomy and to minimally invasive sternotomy.

Conclusions: The association between miastenia gravis and thymomas has long been reported. We have found that with thymic neoplasms showed a high frequence of both miastenia gravis and other unrelated autoimmune diseases, although statistical significance could not be reached due to small sample size. A possible relation with non-related malignant neoplasms could be a target for further investigation.

CT-06

IS THERE A ROLE FOR SURGERY IN THE MANAGEMENT OF ADVANCED STAGE NSCLC? – PROSPECTIVE OBSERVATIONAL STUDY AND REVIEW OF THE LITERATURE

Cristina Rodrigues (Portugal)[3]; Daniel Cabral (Portugal)[3]; Paula Alves (Portugal)[1]; Dolores Canário (Portugal)[2]; Francisco Félix (Portugal)[3]

[1] Unidade de Pneumologia Oncoligia Pneumológica, Hospital Pulido Valente, CHLN; [2] Grupo Multidisciplinar de Pneumologia Oncolócica, Hospital Garcia de Orta,EPE; [3] Serviço de cirurgia torácica, Hospital Pulido Valente, CHLN

Although current clinical practice guidelines, exclude surgery from the initial management of advanced stage NSCLC, there are singular cases of good responders to systemic therapy, which might benefit from surgical resection of the primary tumour. We report 3 consecutive cases of lung adenocarcinoma, prospectively followed, involving two multidisciplinary teams. One was staged IIIB (T1bN3M0) and two IVa (T3N3M1a and T2bN2M1a). Two received chemoradiotherapy, and one, with an EGFR mutation on exon 21, was treated with erlotinib. Surgery was considered after persistent local progression of the primary tumour, when all other sites were controlled by systemic therapy. Disease free survival (DFS) after surgery was 12,3 months on average, with progression in the mediastinum and contralateral lung. No local or extra thoracic recurrences occurred, with a medium overall survival (OS) of 94 months. All patients are still alive at this time, one with a complete metabolic response under nivolumab (69 cycles), one with a partial response to osimertinib, and the other with stable disease, after several infectious complications and an anaphylactic reaction to carboplatin has decided to stop treatment.

CT-07

LUNG HERNIA RELATED WITH A BULL: CASE REPORT

Sara Lopes (Portugal)[1]; Rita Costa (Portugal)[1]; João Maciel (Portugal)[1]; Jorge Casanova (Portugal)[1]; Pedro Bastos (Portugal)[1]; Paulo Pinho (Portugal)[1]

[1] Centro Hospitalar São João, Porto

Lung herniation is an uncommon entity which has been described since 1845 mainly as case reports. Acquired lung hernia, especially traumatic, is the most common etiology. In the absence of clear guidelines, management of lung hernia is made in a case-by-case basis. We present an asymptomatic middle lobe hernia perceptible on physical examination, but diagnosed initially by imaging studies. Patient medical history included a blunt bull trauma fourteen years before.

CT-08

PLEURAL HIBERNOMA: CASE REPORT

Catarina Carvalheiro (Portugal)[1]; Javier Gallego (Portugal)[1]; Jorge Cruz (Portugal)[1]

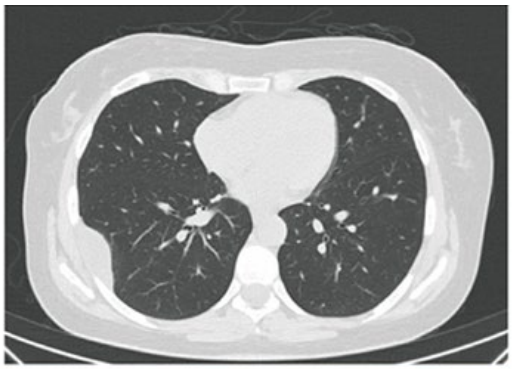
[1] Unidade de Pulmão - Fundação Champalimaud

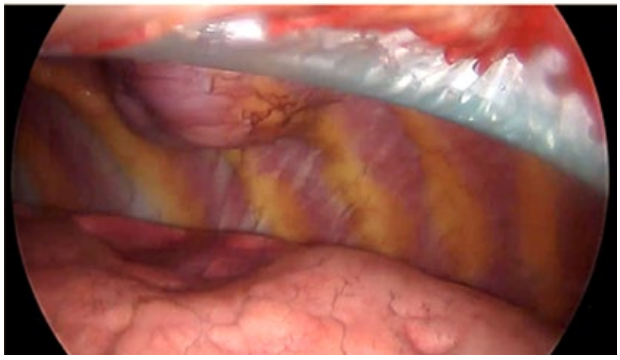
Introduction: Hibernomas are rare benign soft tissue tumors containing brown adipocytes that resemble normal brown fat and take their name from the histological similarity to the brown fat of hibernating animals. The distribution of this tumor follows the sites of persistence of brown fat and the most common sites are neck, shoulder, thorax (mediastinum and pericardium), back, abdomen, retroperitoneum and thigh. Tumors involving the pleura are extremely rare.

Case report: We present the clinical case of a 41 years old female, previously healthy, that enters an Emergency Department presenting with a sudden intense thoracic back pain, with no accompanying signs or symptoms. The thorax CT (Computed Tomography) scan showed a right pleural nodular lesion, homogeneous and well defined limits, 56x20mm of larger diameters, suggesting a pleural fibrous tumor. All the exams done in this setting didn´t show other relevant findings and her blood work was also normal. She was submitted to a TTB (Transthoracic Biopsy) that revealed a Pleural hibernoma and in the Lung Unit Multidisciplinary Meeting was decided a surgical treatment. The patient underwent a right pleural tumor resection through a VATS-SP (Video Assisted Thoracic Surgery- Single Port) procedure. The surgery and the postoperative period went uneventful. The chest tube was removed in the 2nd postoperative day and was discharged home in the same day after chest X-ray control. The Pathology reported histopathological and immunohistochemical features of Hibernoma. The patient continues on clinical and image surveillance, clinically well and back to work and physical activities; the next follow up is 3 months after surgery.

Discussion: Hibernomas generally occur in adults with a peak incidence in the third decade and with female predominance. It is usually a small, benign, lobulated, nontender lesion but can present with tenderness when the

tumor grow and compress surrounding structures. In most cases, it manifests as a painless mass and is an incidental finding on physical examination or imaging. Complete surgical excision is the treatment of choice and the prognosis is excellent as there have been no reports of recurrence or metastatic disease in hibernomas patients. Its indistinguishable nature both clinically and radiographically from other benign lesions as lipomas and even malignant tumors as lipossarcomas, emphasizes the importance of its inclusion in the differential diagnosis.





CT-09

PRIMARY PLEURAL SCHWANNOMA: CASE REPORT

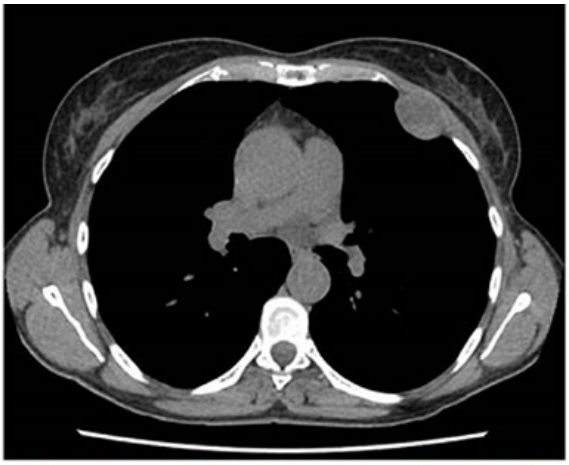
Catarina Carvalheiro (Portugal)[1]; Javier Gallego (Portugal)[1]; Jorge Cruz (Portugal)[1]

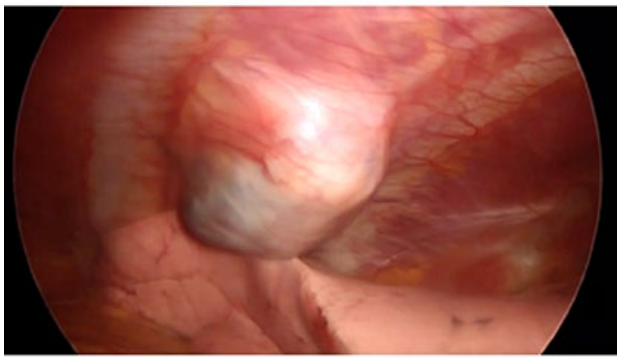
[1] Unidade de Pulmão - Fundação Champalimaud

Introduction: Schwannoma, also called Neurilemmoma, is a benign tumor arising from the peripheral autonomic nerve fiber sheaths. The most common sites are extremities, neck, mediastinum, retroperitoneum, posterior spinal roots and cerebellopontine angle. Pleural Schwannomas are exceedingly rare neoplasms of the thoracic cavity.

Case report: We report the case of a 58 years old female, non-smoker and no relevant medical history, that had a routine chest X-ray that showed a left pleural mass. The thorax CT (Computed Tomography) scan showed a left anterior 21x27mm pleural nodular lesion, located in the 3rd intercostal space, and no other relevant findings. The pacient also performed a PET (Positron Emission Tomography)-CT scan with dim metabolic expression in the left pleural lesion, maximum SUV (Standardized Uptake Value) of 3, which required histological definition. She was submitted to a left pleural tumor resection by VATS-SP (Video Assisted Thoracic Surgery-Single Port). The procedure and the post-operative period went uneventful. The chest tube was removed in the second post-operative day and she was discharged home in the same day after chest X-ray control. The Pathology reported histopathological and immunohistochemical features of Schwannoma. The patient continues on clinical and image surveillance, clinically well and back to work and physical activities; the next follow up is 3 months after surgery.

Discussion: Imaging and histopathological examination are necessary to diagnose pleural Schwannomas. The standard of care of their management is primarily surgical resection, whenever technically possible, and frequent continuous follow-up.





ANGIOLOGY AND VASCULAR SURGERY

ORAL COMMUNICATIONS & SHORT COMMUNICATIONS

SELECTED ORAL COMMUNICATIONS
Saturday, November 24th, 3:00 pm

CS-01
DID THE EMERGENCE OF REVAR CHANGE THE RUPTURED AAA TREATMENT PARADIGM IN PORTUGAL?

Ricardo Castro-Ferreira (Portugal)[1,2]; Alberto Freitas (Portugal)[3]; Tiago Soares (Portugal)[2]; Paulo Gonçalves Dias (Portugal)[2]; Sérgio Moreira Sampaio (Portugal)[2]; José Fernando Teixeira (Portugal)[2]; Adelino Leite-Moreira (Portugal)[1]

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Background: Ruptured abdominal aortic aneurysm (rAAA) remains a highly lethal condition, with mortalities rates above 80%. Several data suggest that endovascular repair (rEVAR) is associated with better results than open repair (OR). This issue remains however highly controversial, with studies reporting conflicting evidence. Moreover, there's a chronic lack of data regarding the subgroup of turndown patients who end up dying without any intervention. Data from nationwide outcomes in rAAA in Portugal have never been reported.

Objective: To compare the in-hospital mortality of rEVAR vs OR in rAAA treated in portuguese public hospitals. To study the factors predicting worse outcomes in rAAA. To assess the number of turndown patients who end up dying without any intervention, and how this was impacted by the rise of rEVAR.

Methods: Every patient registered between 2004 and 2016 in a Portuguese public hospital with rAAA and submitted to rEVAR, OR deceased without any procedure were included in the study. The information was obtained through the Central National Healthcare Administrative Database, a mandatory registry for hospital reimbursement. The primary outcome was hospital mortality. Patient demographics, comorbidities and hospital length of stay were also evaluated.

Results: A total of 1475 patients were included. The overall mortality was 61.4%, the mean age was 72.6 years and 89.6% were males. The majority (n=1015, 68.8%) were submitted to OR, 184 to rEVAR (12.5%) and 276 died without any procedure (turndown cases - 18.7%). The in-hospital mortality of rEVAR was significantly lower than the OR – 39.1% vs 55.1%, $p<0.001$. The mean age was similar between groups (72.4 years in rEVAR vs 72.9 in OR) as was the comorbidities frequency. The overall median hospital length of stay was 8 days for both groups, but the survivors' subgroup analysis showed significant shorter hospitalization for rEVAR (9.5 vs 16 for OR, $p<0.001$). OR and age ≥80 years were independently associated with higher mortality (OddsR 2.0 for OR and 2.1 for age, $p<0.001$). Female gender and age ≥80 years were associated with higher degree of turndown for surgery ($p<0.001$). The proportion of rEVAR increased from 0 in 2004 to 30% in 2016. This increase did not correlate with a lower proportion of turndown cases during the observed time.

Conclusion: rAAA remains a highly lethal condition. This real-life data suggests lower mortality rate for rEVAR. A high number of patients die without any intervention, a number that remained the same despite the increase in rEVAR.

CS-03
TREATMENT OF RUPTURED ABDOMINAL AORTIC ANEURYSM IN THE ERA OF EVAR - A MODIFIED PREDICTION SCORE FOR 30-DAY MORTALITY AFTER 48-H OF ICU

Andreia Coelho (Portugal)[1]; Miguel Lobo (Portugal)[1]; Jacinta Campos (Portugal)[1]; Rita Augusto (Portugal)[1]; Nuno Coelho (Portugal)[1]; Ana Carolina Semião (Portugal)[1]; João Pedro Ribeiro (Portugal)[1]; Alexandra Canedo (Portugal)[1]

[1] Centro Hospitalar Vila Nova de Gaia e Espinho

Aim: The aim of this paper is to identify predictors of mortality for ruptured abdominal aortic aneurysm (rAAA), focusing on parameters at 48 hours of maximal intensive care unit (ICU) care following surgery, with the final purpose of developing a new score for predicting survival at 48 hours, in an era in which both EVAR and open repair (OR) are available.

Methods: Clinical data of all patients admitted from January 2010 to December 2017 with the diagnosis of rAAA were retrospectively reviewed. Statistical analysis was performed with SPSS V.25.

Results: A total of 78 patients were included in this study, 21 EVARs, 56 ORs and one case of conservative management. Intra-operative mortality in EVAR and OR groups was 0% versus 24.6% respectively (p=0.012) and 30-day mortality reached 50% and 33% respectively (p>0.05). For patients alive at 48 hours, 30-day mortality diminished to 27.6%. Several pre-operative predictors of outcome were identified: smoking(p=0.004), hemodynamic instability (p=0.004) and elevated international normalized ratio (INR) (p<0.0001). Dutch Aneurysm Score and Vascular Study Group of New England (VSGNE) Score were also significant predictors of outcome (ROC AUC 0.89 and 0.79 respectively; p<0.0001). Intra-operative predictors included increased blood loss (p=0.007) and fresh frozen plasma and red blood cells transfusion requirements (p=0.021 and p=0.001).

At 48h of ICU stay, high lactate level, high SOFA (Sequential Organ Failure Assessment) score, need for haemodialytic technique and haemodynamic instability were significant risk predictors for 30-day mortality (p<0.05). VSGNE score was modified with the inclusion of 2 variables: haemodynamic instability and lactate level at 48 hours. Comparing AUC for VSGNE and modified VSGNE scores for patients alive at 48 hours, the latter was significantly better (AUC 0.775 versus 0.852; p=0.039).

The modified VSGNE score is being externally validated with patient data from independent vascular surgery centres.

Discussion: Nowadays, rAAA remains a critical life-threatening condition and the decision whether or not to proceed with surgical intervention is extremely difficult. Therefore, the policy in our Department is to try surgical repair in all rAAA cases, hence the low conservative management rate (1.3%) and the relatively high intra-operative mortality rate (14.1%). It remains important however to identify whether late deaths can be predicted, so that unnecessary prolonged ICU treatments can be avoided. A modified VSGNE Score was delineated predicting 30-day mortality significantly better in patients alive at 48 hours. External validation is currently ongoing.

CS-04

IMAGIOLOGIC AND CLINICAL PREDICTORS OF INTRA-OPERATIVE NEUROLOGIC DEFICITS DURING CAROTID ENDARTERECTOMY WITH LOCO-REGIONAL ANESTHESIA

João Neves (Portugal)[1]; Joao Filipe (Portugal)[2]; António Neves (Portugal)[1]; Daniela Barros (Portugal)[1]; Juliana Macedo (Portugal)[1]; Joel Sousa (Portugal)[3]; Luis Gamas (Portugal)[3]; José Teixeira (Portugal)[3]

[1] Department of Biomedicine – Unit o Anatomy - Faculty of Medicine of the University of Porto, Porto, Portugal; [2] Department of Neurorradiology, Centro Hospitalar universitário de S.João, Porto, Portugal; [3] Department of Angiology and Vascular Surgery, Centro Hospitalar Universitário de S.João, Porto, Portugal

Introduction: Carotid cross-clamping during endarterectomy predisposes to perioperative neurological deficits due to embolism or cerebral hypoperfusion. Carotid clamping reduces blood flow to the brain leading to hypoperfusion and could be accentuated if compromised collateral circulation is present (2, 5-7). Therefore, recommendations align to avoid hypotension and ajust blood pressure into high normal values during CEA. An associated risk of postoperative stroke incidence if cerebral ischemia is detected is also well established. This work aims to evaluate the predictive factors of post-clamping neurological deficits and the association with major adverse events. Watershed stroke is associated with low function willis circle.

Material and methods: From January 2009 to January 2018, 79 patients from a Portuguese Central Hospital who underwent carotid endarterectomy with loco-regional anesthesia for carotid artery stenosis and manifested post-clamping neurologic deficits were retrospectively gathered. The controls were selected consecutively. Demographics, comorbidities, imaging tests and clinical/intraoperatory features were evaluated. For data assessment, univariate, variance and multivariate analysis were performed.

Results: Age was found to increase clamping intolerance risk (OR = 12:1 for every 10 years), although not confirmed by multivariate analysis. Patients with neurologic manifestations were significantly more obese than the control group (OR = 9.308; 95% CI: 2.572 – 33.691; P=0.01). Lower degree of ipsilateral stenosis and higher degree of contralateral stenosis were also significantly related to clamping intolerance (OR = 0.702; 95% CI: 0.495-0.995; P=0.047 and OR = 1.262; 95% CI: 1.061-1.500; P=0.009, respectively). Watershed Stroke over tissue-stroke was also a main predictor of post-clamping deficit (OR = 6.225; 95% CI: 1.804-21.802; P=0.02). Post-clamping deficits was the main stroke predictor (OR = 4.295; 95% CI: 1.104-16.707; P=0.035), additionally Calcium channel blockers and contralateral stenosis were determined as independent risk factors for stroke (OR = 4.340; 95% CI: 1.246-15.115; P=0.021, OR = 1.212; 95% CI: 1.039-9.482; P=0.078).

Conclusion: Obesity, watershed stroke, lower degree of ipsilateral stenosis and higher degree of contralateral stenosis demonstrated association with post-clamping neurological changes. Intra-operatory neurologic deficit is a significant stroke risk factor, as well as Calcium channel blockers and contralateral stenosis.

CS-05

THE ROLE OF ENDOVASCULAR SURGERY IN DEEP FEMORAL ARTERY OCCLUSIVE DISEASE: A REVIEW

Mafalda Correia (Portugal)[1]; Vânia Constâncio (Portugal)[1]; Bárbara Pereira (Portugal)[1]; Luís Antunes (Portugal)[1]; Gabriel Anacleto (Portugal)[1]; Óscar Gonçalves (Portugal)[1]

[1] Centro Hospitalar e Universitário de Coimbra

Introduction: Surgical angioplasty is the gold standard treatment of deep femoral artery occlusive disease. However, endovascular surgery might be an option in selected cases.

Objective: The objective of this paper is to review published outcomes of endovascular surgery in the treatment of deep femoral artery occlusive disease.

Methods: A research of published articles was done through PubMed® and Embase®. The Mesh terms used were: deep femoral artery, profunda artery, angioplasty, endovascular, profunda stenting. Then, a research from bibliographic references of the articles primarily selected was performed.

Results and discussion: By the end of the research, a limited number of articles with variable results were found. This variability is mainly associated with differences between the groups of patients studied: patients with claudication and/or patients with critical ischemia; patients with or without previous revascularization surgery; distinctive indications for surgery and treatment options – balloon angioplasty, stenting, drug-eluting stenting, bailout stent vs. primary stenting; concomitant treatment of other lesions or not; and established outcomes. Nevertheless, most of studies presented outcomes that support the endovascular surgery in the treatment of deep femoral artery occlusive disease, particularly in patients with high surgical risk or with circumstances that difficult conventional surgery.

Conclusions: Despite surgical angioplasty being the gold standard treatment of deep femoral artery occlusive disease, the endovascular treatment may be the first choice in selected cases. The few published studies that address this question have a limited sample size and the differences between patients challenge the comparison of outcomes. In conclusion, more studies are necessary to validate the endovascular treatment of the deep femoral artery occlusive disease.

CS-06

SINGLE-CENTER EXPERIENCE IN ARTERIAL CATHETER DIRECTED THROMBOLYSIS - A SAFE AND EFFICIENT UNDERUSED MODALITY FOR TREATING ACUTE LIMB ISCHEMIA IN SELECTED PATIENTS

Ricardo Correia (Portugal)[1]; Ana Garcia (Portugal)[1]; Rita Ferreira (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Rita Bento (Portugal)[1]; Maria E. Ferreira (Portugal)[1]

[1] Hospital de Santa Marta, CHLC

Introduction: Nowadays, arterial catheter directed thrombolysis (CDT) is the gold standard modality in surgical management of acute limb ischemia graded as Rutherford IIa.

However, CDT requires strict logistics, which includes intensive/intermediate care unit hospitalization and angiographic revaluations in every 12-24 hours. These are obstacles to its use in vascular departments in Portugal. This study aims to present our experience in arterial CDT and its results.

Methods: This is an observational retrospective study. Using patient files consultation, we identified every arterial CDT procedure in upper and lower limbs done in a tertiary hospital. Patient profiles and procedure characteristics were collected. Primary outcome was CDT effectiveness, defined as angiographic improve in arterial thrombus burden. Secondary outcomes were CDT duration, CDT complications, secondary procedures, hospitalization time, amputation and death rates.

Results: CDT was used in 45 patients (71% male). Mean age was 63 years.

In 56% of patients, CDT was the first vascular procedure in target vascular bed.

In 79% of procedures, there was a presumed evolution of thrombus with <14 days.

44% of CDT were done because of acute limb ischemia in previously untreated vascular bed.

In patients with acute limb ischaemia, 73% was staged as class IIa (Rutherford).

22% of CDT were done because of bypass or stent occlusion.

Popliteal artery was most commonly affected (69%). In 24% of patients, there was a popliteal aneurysm.

In 36% of patients there was a CDT interruption due to fibrinogen fall or CDT complications (14%:

distal embolization, hemorrhagic stroke, access hematoma, catheter thrombosis).

Median time of CDT was 2 days. Median time to the 1st angiographic revaluation was 1 day and to final angiography was 2 days.

In 82% of patients there was an anatomic improve in thrombus burden in the target artery. CDT was most efficient in patients with acute limb ischaemia and patients with acute popliteal artery aneurysm occlusion or embolization (100% effectiveness).

After CDT, 27% of patients underwent an endovascular procedure to repair the primary anatomic lesion. 29% of patients underwent a conventional open procedure. 27% patients underwent major limb amputation.

Median time to discharge was 11 days after CDT.

Median time of survival after CDT was 98±2% at 1 month, 95±3% at 1 year and 82±7% at 5 years.

Conclusions: CDT is a safe and efficient treatment modality in selected acute limb ischemia, associated with less surgical morbimortality and better vascular outcomes compared with conventional surgery. It should be an option in every vascular department.

ORAL COMMUNICATIONS 1
Friday, November 23rd, 5:00 pm

CO-01
SYSTEMATIC REVIEW ON THE USE OF SHUNT DURING CAROTID ENDARTERECTOMY

Filipa Jacome (Portugal)[1]; Joao Neves (Portugal)[1]; José Fernando Teixeira (Portugal)[1]

[1] Centro Hospitalar Universitário de São João, EPE

Objective: Stroke is the main cause of morbimortality in the intra and post carotid endarterectomy. After surgery, the gold-standard of neurologic monitoring is consecutive neurologic exams with regional anaesthesia. The main method to reduce the cerebral hypoperfusion due to carotid artery cross clamping is the resort to shunt.

The Aim of this study is to evaluate the incidence of shunt during carotid endarterectomy under regional anaesthesia. The 30 days stroke, stroke-death rate and conversion to general anesthesia were also evaluated.

Methods: A systematic review of the reports of series of patients who underwent carotid endarterectomy under regional anaesthesia, published between 1996 and 2018 in Pubmed, Scopus and ISI of knowledge.

Of the 289 articles, 121 were reviews and case reports, 23 had a publication date before 1995, 12 did not met the standards of report, one did not resort to shunt, and 56 the main article was not obtainable.

Results: A total of 42 articles, with 31442 patients, met the inclusion criteria. The median of the shunt rate in the prospective studies was 10.2% (IQR 95% - 0.5-35.8%). In the retrospective studies the median was 7.7% (IQR 95% - 4 – 27.8%). The median general anaesthesia conversion rate in the patients who demonstrated intra-operatory neurologic deficit is 18.8% (IQR 95% - 0-100%). Publication bias was clearly present. The median stroke rate in patients who shunt was deemed necessary, and presented with intra-operatory neurologic deficit was 12.5% (IQR 95 – 2.7 – 66.7%), although only five studies reported this information.

Conclusion: The necessity of shunt in patients submitted to carotid endarterectomy under regional anaesthesia is 10.2%. Few studies report the 30 day stroke rate of this subgroup, and it`s prevalence is not defined reliably.

CO-02
CAROTID ARTERY STENTING - 10 YEARS EXPERIENCE IN A VASCULAR SURGERY DEPARTMENT

Orlanda Castelbranco (Portugal)[1]; Alexandre Aranha (Portugal)[1]

[1] Hospital de Egas Moniz

Carotid artery stenting (CAS) is a valid alternative treatment for carotid disease. This technique has had positive evolution, since it's beginning (1994) and recent studies (CREST trial) has shown that CAS can be performed with an equivalent major event rate compared with carotid endarterectomy.

The authors describe their experience in endovascular treatment of carotid artery disease. A retrospective review of the clinical files in the last ten years was made. the authors identified 107 patients who had been treated with CAS. The main indications for this option were: surgeon's preference, contralateral occlusion and carotid restenosis. The average age of the patients was 68,3 years (47-89 years) and there was a male predominance (76%). The morbidities, types of stents and cerebral protection devices used were recorded. No deaths occurred with in 30 days after surgery but there were 5 strokes (2 minor and one from contralateral hemisphere). In a patient with stroke and acute stent thrombosis it was possible to reopen the stent after surgical and aspiration thrombectomy. This procedure allowed for the total

recanalization of the closed stent and remission of the stroke symptoms. The mean follow-up was 42,24 +/-30,06 months.

Our experience showed that CAS in Hospital de Egas Moniz is a safe treatment with comparable results to international studies. The good results achieved result from a judicious selection of the patients, availability of appropriate material and good technical skills of the operators.

CO-03
AN 8-YEAR EXPERIENCE WITH THORACIC ENDOVASCULAR AORTIC REPAIR

Rita Augusto (Portugal)[1]; Jacinta Campos (Portugal)[1]; Pedro Sousa (Portugal)[1]; Andreia Coelho (Portugal)[1]; Nuno Coelho (Portugal)[1]; Evelise Pinto (Portugal)[1]; Ana Semião (Portugal)[1]; João Ribeiro (Portugal)[1]; Daniel Brandão (Portugal)[1]; Alexandra Canedo (Portugal)[1]

[1] Centro Hospitalar de Vila Nova de Gaia/Espinho

Introduction: The development of thoracic endovascular aortic repair (TEVAR) has allowed a minimally invasive approach for management of a range of thoracic aortic pathologies. Initially developed specifically for exclusion of thoracic aortic aneurysms, TEVAR is now used as an alternative to open surgery for a variety of these pathologies due to the lower morbidity and safety of this approach. However, the long-term success of TEVAR remains poorly defined and the appropriated follow-up is essential to diagnose and manage delayed TEVAR failure.

Methods: Retrospective institutional review of consecutive patients requiring endovascular repair of thoracic aorta (January 2010-September 2018). The aim of the present study is to report our experience concerning patients who underwent TEVAR for different etiologies. We evaluated demographics and co-morbidities data and performed statistical analysis to determine factors and outcomes as technical success during implantation, procedure related complications and secondary procedures. Operative reports were also reviewed to analyze the endovascular procedures and techniques.

Results: Forty-five patients underwent TEVAR during the period of study – 51 interventions –90,2% were male with a mean age of 66,9 years. The comorbidities presented were hypertension (88,7%), hypercholesterolemia (55,3%), smoking (46,8%), chronic renal disease (23,4%), DM (14,9%), coronary artery disease (12,8%) and peripheral artery disease (12,8%). There were multiple etiologies that motived the TEVAR. In 47% it was due to aneurismal disease, in 13,7% by aortic dissection and in 5,9% by necessity of relining the previous stent graft. Device delivery was always possible, resulting in a technical success rate of 100%. Extensive arch or visceral artery debranching procedures were performed to extend landing zones when was necessary. Open debranching procedures of arch vessels were performed in 11 patients. The proximal landing zone according to Ishimaru classification was 0 (5,9%), 1 (7,8%), 2 (35,3%), 3 (17,6%) and 4 (33,3%). Device delivery was accomplished using ultrasound guided percutaneous approach in 78,4% of cases. A median of 1,4 stent grafts components were placed per patient and a median of 150 cm of aorta coverage. Thirty days complications rate was 11,7%. The median follow-up (FU) time was 13 months (mo). The 30 days and 12 months global survival was 85,3% and 80,4%, respectively.

Conclusions: The role for TEVAR for aortic disease has already been well defined. According to our experience, it appears to be a minimally invasive, safe and effective procedure. The risk of treatment failure persists, as we demonstrated by our relining cases, which highlights the importance of an adequate follow-up of these patients, to prevent future and potentially harmful complications.

CO-04
PREOPERATIVE EMBOLIZATION OF CAROTID BODY TUMORS: YES OR NO?

Tiago Soares (Portugal)[1]; João Rocha-Neves (Portugal)[1]; Ricardo Castro-Ferreira (Portugal)[1]; Luis Gamas (Portugal)[1]; António Rocha-Neves (Portugal)[1]; Paulo Dias (Portugal)[1]; Sérgio Sampaio (Portugal)[1]; José Fernando Teixeira (Portugal)[1]

[1] Hospital São João

Introduction: Carotid body tumors (CBT) are rare paragangliomas for which surgical resection is still the recommended treatment. Frequently they are a benign disorder, discovered as asymptomatic neck masses located at the carotid bifurcation. Preoperative embolization has been used to decreased intraoperative blood loss and complications. However, there is still much controversy and some studies argue that it could increase the risks without benefit.

This study aimed to investigate the impact of embolization on outcomes following CBT resection.

Methods: A single-center analysis of electronic clinical records on patients treated in the last 10 years (January 2008 – January 2018). The patients were divided into 2 groups: Resection alone (CBTRA) and preoperative embolization (CBTPE).

Results: Sixteen tumors were identified. Of these, 10 underwent CBTRA and 6 underwent CBTPE. Median follow-up was 46 months [18 – 87, 75]. Only 1 tumor was malignant, and no disease recurrence was detected. When compared CBTRA with CBTPE there were no differences in Shamblin classification (p=0.159), although the mean

size of the tumor was significantly bigger in the last group (34,1mm v. 47,2mm p=0,010).

The mean days of hospitalization (3,90 v. 6,83 p=0.012) and the surgery time (147min v. 230min p=0.05) were significantly larger in group CBTPE. Concerning the cranial nerve injury (20% v. 66.7% p=0.092) and need of transfusion intraoperatively (10% v. 16,7% p=0.625), no differences were verified.

Conclusions: The role of preoperative embolization in CBT has been questioned. Despite baseline differences between groups that may put comparability at stake and in this study there were no advantages in preoperative embolization.

CO-05
THORACIC OUTLET SYNDROME: CASUISTIC REVIEW

Vânia Constâncio (Portugal)[1]; Joana Silva (Portugal)[1]; Ricardo Vale Pereira (Portugal)[1]; Manuel Fonseca (Portugal)[1]; Óscar Gonçalves (Portugal)[1]

[1] Centro Hospitalar e Universitário de Coimbra

Thoracic outlet syndrome (TOS) is characterized by a variable combination of signs and symptoms resulting from compression of the neurovascular structures traversing the thoracic outlet. It has an estimated incidence of 1-2%, affects mainly women (70% of cases) between 20 and 50 years and is usually underdiagnosed. The appearance of symptoms usually occurs in patients with an anatomical predisposition such as the presence of a cervical rib or after a cervical trauma. According to the patient complaints, it can be classified as arterial (aTOS), venous (vTOS) or neurologic TOS (nTOS), the latter being the most frequent. The treatment options depends on the TOS type and it may include physiotherapy, anticoagulation and surgical treatment, either by a supraclavicular or transaxillary approach and with or without vascular reconstruction.

In this work we retrospectively analyze all TOS cases treated surgically over the last 13 years in our Department. For the purpose we evaluate the clinical registries concerning the surgical approach, peri-operative morbi-mortality and overall clinical outcomes.

Eighteen patients were included, three presenting with bilateral syndrome, resulting in 21 surgical procedures. There was a higher incidence in the female gender (72% of cases) with a medium age of 34,3 years (range between 19 and 66 years). The most common presentation symptoms were lost of strength, paresthesias and member cooling. There were 2 cases presenting in an acute form: a case of acute ischemia and a case of deep venous thrombosis. The most common TOS type was nTOS (61,1% of cases) followed by aTOS (27,8%) and vTOS (5,55%). One case of coexisting aTOS with nTOS was identified and in 4 cases bilateral cervical rib was diagnosed with a male preponderance (75%). Surgical procedure duration was in average 75 minutes, the transaxillary approach was the most frequent (17 in the total of 21 procedures) and in 4 cases arterial reconstruction was needed. The average length of stay after surgery was 4 days and morbidity occurred in 4 cases (2 pneumothorax and 2 local hematomas) with no mortality. Overall, there was improvement in quality of life after treatment. In sum, our Department results are similar to those described in the literature, reflecting our experience in treating this specific syndrome.

CO-06
ORAL ANTICOAGULATION PRESCRIPTION AFTER EMBOLECTOMY FOR ACUTE UPPER LIMB ISCHEMIA: A 5-YEAR ANALYSIS

Joana Cruz Silva (Portugal)[1]; Vânia Constâncio (Portugal)[1]; Juliana Varino (Portugal)[1]; Manuel Fonseca (Portugal)[1]; Óscar Gonçalves (Portugal)1

[1] Centro Hospitalar e Universitário de Coimbra

Introduction: Acute upper limb ischemia annual incidence has been reported as 1.3 cases per 100.000. Importantly, these patients should receive lifelong anticoagulation unless contraindicated in order to prevent recurrence of thromboembolic disease.

Objectives: To evaluate short- and long-term anticoagulation following thrombembolectomy of the upper extremity.

Methods: All patients with diagnosis of acute upper limb ischemia undergoing thrombembolectomy with Fogarty catheter in our institution from January 2013 until March 2018 were retrospectively identified.

Results: 172 patients were included. Median age was 74 (range 43-104) and 126 were females (73%). 127 suffered from hypertension, 42 diabetes and 32 had known history of cerebral stroke. 115 (67%) had previous or inaugural arrhythmia and another 12 patients had cardiac arrhythmia diagnosed after discharge. 76% (130) of the events were considered cardioembolic. 3.5% of the patients were correctly anticoagulated, 12% were on subtherapeutic anticoagulation and 37% were on antiaggregation. There were 20 wound complications, 2 major limb amputations and 3 reinterventions due to reocclusion. There was a 5.8% 30-day mortality and a 41.3% mortality at the time of the study.

75% of the 168 patients had written indication for long-term anticoagulation at discharge/transference note;

9.6% were treated with coumarin, 26% received new oral anticoagulants (NOACs) and 58.6% low-molecular-weight heparin. 65 patients were transferred to residence hospital. Only 40% of the 120 patients who had explicit indication to be observed by Cardiology/Internal Medicine were oriented by these specialties and only 17% were observed in Vascular Surgery consultation after discharge. 46% were followed by the family doctor.

Long-term medication was assessed in 118 patients. 78 patients (66%) were hipocoagulated at 6-months follow--up and 80 patients were correctly hipocoagulated at the time of death/time of study (80% with NOACs). Acute limb ischemia recurrence was 4.2%.

Discussion: There was an association between being followed by Cardiology/Internal Medicine/Vascular Surgery after discharge and long-term hipocoagulation (p0.016), while no correlation between being transferred to residence hospital or being followed by the family doctor and long-term hipocoagulation was established (p0.750). A correlation among NOACs prescription at discharge and long-term NOACs medication was identified (p0.000). There was a 1.3% recurrence rate in patients who were correctly hipocoagulated and a 12.5% recurrence rate in patients who were not long-term hipocoagulated.

In conclusion, oral anticoagulation should be prescribed at the time of discharge in order to maintain long-term anticoagulation and patients treated for acute upper limb ischemia should be directly referred to Cardiology/Internal Medicine/Vascular Surgery consultation.

SHORT COMMUNICATIONS

Friday, November 23rd, 6:00 pm

CO-01

PELVIC CONGESTION SYNDROME: COMMON CAUSES AND CURRENT ENDOVASCULAR TREATMENT OPTIONS

Joel Sousa (Portugal)[1,2]; João Neves (Portugal)[1]; Luís Gamas (Portugal)[1]; José Lopes (Portugal)[1]; José Teixeira (Portugal)[1]

[1] Hospital de S. João; [2] Faculdade de Medicina da Universidade do Porto

Introduction: Pelvic congestion syndrome (PCS) is a chronic medical condition caused by the presence of varicose veins in the pelvic cavity. Its diagnosis is often challenging, since symptoms are non-specific and physical finding are frequently absent, making it an important cause of morbidity in women.

Several condition are known to be associated with pelvic congestion syndrome, with particular focus on gonadal vein insufficiency, Nutcracker syndrome, May--Thurner syndrome, and internal iliac vein insufficiency

Methods: The authors present four different cases of pelvic congestion syndrome, successfully treated by endovascular means: ovarian vein embolization with sandwich technique; left renal vein stenting in nutcracker syndrome; left iliac vein stenting in May-Thurner syndrome; right internal iliac vein embolization.

Results: Case1- Female, 32 years-old, 2G1P, referred after incidental finding of pubic varicose veins. When questioned, the patient referred significant pelvic pain, as well as dyspareunia. Venous CT (CTV) revealed the presence of an enlarged right gonadal vein (14mm) as well as evidence of significant pelvic collateralization. Successful treatment was obtained by selective coil embolization (sandwich technique) of the right gonadal vein, as well as some pelvic collaterals. Case2-Female, 50 years--old,1G1P, referred after incidental finding of nutcracker syndrome in a CTA performed due to chronic pelvic pain. A venographic study with renocaval pullback was performed, revealing a pressure gradient>3mm, as well as abundant pelvic collateralization. Endovascular treatment was successfully performed through the implantation of a dedicated venous stent in the left renal vein, under IVUS guidance. Case3-Female, 31 years-old,1G1P, referred after incidental finding of atypical left anterior tigh varicose veins. Due to the concomitant presence of symptoms compatible with PCS, a CTV was performed, and significant compression of the left iliac vein in the May-Thurner point with abundant pelvic collateralization was noted. Venograhy confirmed such findings, and endovascular treatment was promptly performed, with the implantation of a dedicated venous stent. Case4--Female, 36 years-old,0G0P, referred by the Obstetrics--Gynaecology outpatient consultation after finding of pelvic varicose veins during intravaginal ultrasound due to CPP. Venographic study demonstrated isolated right iliac vein (RIV) insufficiency with abundant associated pelvic collateralization. Selective coil embolization of the RIV and collaterals was performed, with significant clinical improvement.

Conclusion: PCS is an underdiagnosed cause of chronic pelvic pain. Although most cases of PCS can be diagnosed by CTV, venography remains the mainstay of diagnosis and treatment.

Proper selection of endovascular technique according to the baseline anatomy is essential for significant patient improvement.

CO-02
ENDOVASCULAR APPROACH TO CORONARY-SUBCLAVIAN STEAL SYNDROME

Nélson Camacho (Portugal)[1]; João Monteiro E Castro (Portugal)[1]; Rita Ferreira (Portugal)[1]; Joana Catarino (Portugal)[1]; Ricardo Correia (Portugal)[1]; Rita Bento (Portugal)[1]; Rita Garcia (Portugal)[1]; Maria Emília Ferreira (Portugal)[1]

[1] Centro Hospitalar Universitário Lisboa Central

Introduction: Coronary-subclavian steal syndrome (CSSS) is a rare event that can lead to cardiac events on patients with internal mammary artery - coronary artery bypass graft (IMA-CABG). This is due to significant ipsilateral subclavian artery (SCA) stenosis resulting in reversed blood flow from the myocardium to the upper limb. Left IMA is the conduit of choice for myocardial revascularization during CABG, but the importance of pre-operative assessment and routine screening of SCA lesions remains in debate.

Objectives: To report a case of CSSS and to review current literature.

Methods: The authors report a clinical case and present a literature review using PubMed with the terms "coronary-subclavian steal syndrome", "CABG failing graft" and "left IMA disease" as major topics. The bibliography of relevant articles has been checked to identify other significant papers.

Results: A 61-year-old woman with a medical history of hypertension, dyslipidemia, smoking and peripheral artery disease, submitted to CABG of left IMA to left anterior descending artery and a venous graft to the marginal artery 9 years earlier. Patient remained asymptomatic till 3 months earlier when she developed chest pain on exertion, particularly when using the left arm. Patient denied other symptoms. Physical examination revealed a reduced left arm pulses and a blood pressure differential between left and right arm (115/70mmHg and 140/81mmHg respectively). Coronary computed tomography angiography revelled the presence of a critical stenosis at the proximal left SCA, without apparent lesions on the venous graft or IMA graft (figure 1).

Under local anesthesia it was placed a 6F introducer sheet on right common femoral artery. The lesion was crossed with a 0.035 hydrophilic guide wire and a long 6F sheet was placed beyond the subclavian lesion. Then primary stenting was performed with a 9x38mm balloon-expandable stent. Control angiography showed as fast flow without residual stenosis on left SCA and good visualization of the IMA graft and left vertebral artery (figure 2). Left arm pulses were gained immediately. The postoperative period was uneventful without recurrence of symptoms. At 6 months follow-up, the patient remains asymptomatic and without restenosis on duplex scan.

Conclusion: CSSS although rare, is a life-threatening condition in patients with SCA stenosis and IMA-CABG surgery. Endovascular approach with left SCA stenting is a minimal invasive procedure with low complication rates. This case report highlights the importance of subclavian disease screening prior to CABG and the feasibility of SCA stenting to treat CSSS.

CO-03
AORTIC ARCH ANEURYSM - A TWO-SPECIALTY APPROACH

Tiago Ferreira (Portugal)[1]; Orlanda Castelbranco (Portugal)[1]; Lourenço Castro E Sousa (Portugal)[1]; Vitor Bettencourt (Portugal)[1]; Duarte Medeiros (Portugal)[1]; Ana Braga (Portugal)[2]; Paulo Oliveira (Portugal)[2]; Pedro Magro (Portugal)[2]; Tiago Nolasco (Portugal)[2]; João Roque (Portugal)[2]; Sérgio Boshoff (Portugal)[2]; Miguel Abecasis (Portugal)[2]; José Neves (Portugal)[2]

[1] CHLO - Hospital de Egas Moniz; [2] CHLO - Hospital de Sta. Cruz

Introduction: The aortic arch is in some ways a "grey area" that is successfully approached by both cardiothoracic and vascular surgeons. Proficiency in both open and endovascular/hybrid surgery allows a tailored surgical strategy according to patient status, the anatomic features of aneurysmal disease and its underlying etiology.

Goals: The authors present the case of a patient treated for aneurysmal disease of the aortic arch with two different approaches.

Methods: A 77-year old male patient presented with a 2-month history of anorexia and weight loss and had developed dysphagia and back pain in the previous 2 weeks. A 6-cm saccular aneurysm of the aortic arch between the left common carotid and the left subclavian artery was diagnosed by CT angiography. The patient underwent resection of the aneurysm with bovine pericardial patch closure through median sternotomy under hypothermic circulatory arrest. Intraoperative findings included pus in the aneurysm cavity and a ruptured plaque on the site of aneurysm formation. Cultures of the aneurysm tissue and peripheral blood were negative. The post-operative course was complicated by a complete AV block mandating pacemaker implantation but was otherwise uneventful. After completing a 30-day course of vancomycin and metronidazole and 12 days of piperacillin/tazobactam the patient was transferred to a secondary hospital. One month later the patient developed hemoptysis and a pseudoaneurysm in the same location with periaortic gas was detected on CT angiography. Given the risks and difficulty of an open reintervention, a hybrid approach was selected. Partial arch debranching through carotid-carotid and left carotid-subclavian bypass

was performed, followed 2 weeks later by TEVAR. Blood cultures remained negative at this point.

Results: After 4 weeks of broad-spectrum antibiotic therapy with vancomycin and metronidazole the patient was discharged with no clinical signs of infection and completed a further 2 weeks of oral metronidazole and linezolid. A control CT angiography showed successful aneurysm exclusion with no radiologic signs of persistent infection.

Conclusion: The presented case highlights the value of cross-specialty care in the treatment of aneurysmal disease of the aortic arch.

CO-04
INFECTED/MYCOTIC AORTIC ANEURYSM: WHAT IS THE BEST TREATMENT? – CASE REPORT AND LITERATURE REVIEW

Bárbara Pereira (Portugal)[1]; Joana Moreira (Portugal)[1]; Pedro Lima (Portugal)[1]; João Alegrio (Portugal)[1]; Óscar Gonçalves (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 rep ort: 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 2017 (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.

CO-05
CERAB - WHEN TECHNICAL SKILLS AREN'T ENOUGH

Orlanda Castelbranco (Portugal)[1]; Alexandre Aranha (Portugal)[1]; Duarte Medeiros (Portugal)[1]

[1] Hospital de Egas Moniz

CERAB technique (covered endovascular reconstruction of the aortic bifurcation) is a recent alternative in the treatment of extensive aorto-iliac occlusive disease. Most registries show a safe and feasible technique with good results regarding patency and clinical improvement. According with TASC II consensus, surgery is still the preferred therapeutic option in TASC D lesions. However there are patients which are high-risk for a traditional aortobifemoral bypass. In these cases, this less invasive endovascular alternative could be an option.

We present 2 clinical cases of young patients (60 and 53 years old) that had aortic thrombosis associated with serious comorbidities that prevented an open surgery. They were proposed to CERAB technique with technical success in both cases and clinical improvement following the surgery. However one patient died in the post-operative period after medical complications (15th day after surgery) and the other patient was discharged well until one and a half month after surgery, when he died of a bowel perforation unrelated with vascular procedure.

These clinical cases show that although endovascular

repair is feasible and effective the patient's medical illnesses compromises the surgical intervention results.

CO-06
CONVENTIONAL IS NEVER OUT OF FASHION

José Oliveira-Pinto (Portugal)[1,2]; Ricardo Castro-Ferreira (Portugal)[1,2]; João Rocha-Neves (Portugal)[1,2]; Joel Sousa (Portugal)[1,2]; José Teixeira (Portugal)[1]

[1] Serviço de Angiologia e Cirurgia Vascular, Hospital de São João; [2] Departamento de Cirurgia e Fisiologia, Faculdade de Medicina da Universidade do Porto

Introduction: Popliteal artery aneurysm (PAA) is the second most frequent location of arterial aneurysms, after the aorto-iliac segment, with an incidence of 0.1% to 2.8%. The most common surgical technique for PAA repair is the medial approach with proximal and distal aneurysm ligation, followed by autologous vein or polytetrafluoroethylene (PTFE) bypass grafting. An alternative technique is the posterior approach, which permits direct opening of the aneurysm sac, interrupting patent side branches of the genicular arteries, and autologous venous or PTFE interposition grafting. The disadvantages of the latter might be more dissection-related complications compared with the medial approach.

Methods: Male, years old. History of smoking and cerebrovascular disease. The patient had bilateral popliteal aneurysms. Three months before, patient had an episode of right popliteal aneurysms thrombosis, with subsequent major amputation due to irreversibility of deficits (Fig 1). On the left side, a 33 mm popliteal aneurysm was also diagnosed and submited to elective repair (Fig 1). The method of choice was posterior endoaneurysmorrhaphy and reconstruction with a short saphenous vein graft: popliteal calcified lesion did not allow for a medial approach with anastomosis at P3 popliteal segment (Fig 2).

Results: No intra-operative vascular or nervous lesions were observed. Post-operative recovery was uneventful.

Postoperative ABI index of 0.8 with arterial duplex showing complete exclusion of the aneurysm with concomitant patency of the bypass with excellent distal perfusion.

Patient was discharged 5 days later and referenced to physical therapy.

Conclusion: Popliteal aneurysm repair using a posterior approach with saphenous vein grafting is safe, and effective. The patency rates are equivalent to those obtained with medial approach with ligation and vein bypass. In addition, the posterior approach eliminates the postoperative complications associated with persistent collateral flow into the aneurysm sac. Despite technically more challenging, represents an interesting choice in patients without favourable anatomy for the medial approach.

Figure 1 - Pre-operative CT and angiography

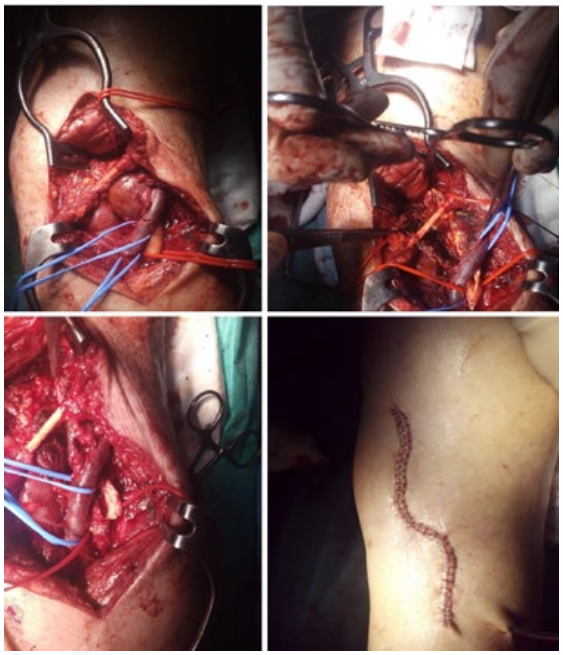

Figure 2. Intra-operative technique

CO-07
HYBRID APPROACH FOR A COMPLEX CHRONIC VENOUS OBSTRUCTION: VENOUS STENTING, ENDOPHLEBECTOMY, AND ARTERIOVENOUS FISTULA - CASE REPORT

António Henrique Neves (Portugal)[1]; João Neves (Portugal)[1]; Joel Sousa (Portugal)[1]; Tiago Soares (Portugal)[1]; Luís Gamas (Portugal)[1]; Isabel Vilaça (Portugal)[1]; Alfredo Cerqueira (Portugal)1; José Teixeira (Portugal)[1]

[1] Centro Hospitalar e Universitário São João

Introduction: Venous stenting is being increasingly performed not only in non-thrombotic iliac vein lesion but also in obstructive venous disease with good results (high patency rates, symptomatic relief and low morbidity).

Endovenous recanalization can be enough in iliofemoral occlusive venous disease although in some cases, when common femoral disease is present, further treatment to improve inflow is required to prevent stent thrombosis. Since stenting of the femoral common vein remains controversial due to worst results because of the risk of stent fracture and re-occlusion, in selected cases, open surgery with endophlebectomy, with or without arteriovenous fistula construction, can be performed to improve inflow and providing a synergic effect with the iliac stenting.

Case report: A 23 year old female came to our outpatient clinic with complains of pos-thrombotic syndrome and pelvic pain – CEAP C3 plus Villalta score of 10. The patient had suffered in 2012 a right iliofemoral venous thrombosis confirmed by ultrasound. A diagnostic/ staging venography revealed obstruction of the right common and external iliac veins and common femoral vein, and on the left side unveiled a May-Thurner type 1. A venous iliac kissing stent was performed with a good outflow and regarding pelvic collateralization. Also, in the control venography, a big delay in the washout due to inflow deficit was observed on the right side, so two more stents were placed until the proximal common femoral vein, which improved inflow less than deemed necessary. An endophlebectomy with patching was performed in the common femoral vein bifurcation, which was also not satisfactory in the surgeons opinion, leading to the construction of an arteriovenous fistula (common femoral artery» common femoral vein with 6 mm reinforced ePTFE). At discharge, symptoms had significantly improved and stent patency was confirmed. The improvement was notorious at 6 weeks.

Conclusion: Endophlebectomy and arteriovenous fistula construction are feasible in complex pos-thrombotic cases synergizing with stenting and is associated with clinical improvement. Further follow up will assess the long-term patency of the procedure.

CO-08
HOW MANY LIVES CAN A PATIENT HAVE?

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[1] Hospital de Egas Moniz

The endovascular treatment of thoracic aneurysms (TEVAR) has revolutionized the postoperative results, particularly in the most fragil patients, with good survival rates and associated low morbidity, thus becoming the preferential therapy in ruptured cases. We present a case of a 73-year-old hypertensive, smoker male that came to Emergency Room with a pleural hematic effusion and chest pain. The investigation showed a large (8 cm) thoracic aneurysm that was successfully treated with TEVAR. After an apparently uneventful procedure the patient developed several complications including paraparesis, re-ruptured aneurysm after a type 1 endoleak, gastric ischemia and hepatic abscesses followed by celiac trunk occlusion, and bacterial endocarditis complicated with stroke. The patient is still alive but dealing with serious septic complications and recent growth of abdominal aneurysm.

After this clinical case the authors review and summarize the current literature regarding TEVAR complications.

CO-09
TREATMENT OF A SPLENIC ARTERY ANEURYSM WITH SELF-EXPANDABLE COVERED STENTS

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Introduction: Splenic artery aneurysms are a rare pathology with an estimated incidence of 0.8% in the general population. In 10% of cases, aneurysm rupture is the clinical presentation, with an associated mortality of 25%. Pregnancy is an important risk factor for rupture. Furthermore, mortality in pregnant women with a ruptured splenic artery aneurysm is higher, above 70%. Therefore, pregnant women and women of childbearing age are first line candidates for treatment. Literature consensus is also to treat aneurysms larger than 2cm.

Treatment modalities involve either open ligation of the splenic artery proximal and distal to the aneurysm with or without splenectomy or an endovascular approach with the use of stent grafts, coil, plug or glue embolization, or a combination.

Methods: In this study, we report the treatment of a fusiform splenic artery aneurysm with the combination of a stent graft and coil embolization.

A 29-year-old female patient was referenced to our outpatient clinic, due to an abdominal ultrasound finding of a splenic artery aneurysm, measuring 25mm of transverse diameter. The patient was asymptomatic. She had no comorbid conditions and reported no previous pregnancies. Computed tomography angiography (CTA) demonstrated a 25 mm fusiform aneurysm in the distal splenic artery, not involving the splenic hilum. Given the patient was of childbearing age, and the aneurysm dimensions, a surgical approach was decided.

Percutaneous access was performed through the left brachial artery. The splenic artery was selectively catheterized and stabilized with a sheath. A major side branch of

the aneurysm was catheterized and coil embolization was performed. Two self-expandable stent grafts were deployed to exclude the aneurysm. Final angiography demonstrated complete aneurysm exclusion, no endoleaks, and perfusion of the splenic parenchyma.

Results: On day 1 after the intervention, stent thrombosis occurred with partial splenic infarction. The patient developed low-grade fever, raised analytical inflammatory markers and moderate epigastric pain, lasting 3 days and gradually subsiding.

Conclusion: Splenic artery stenting and embolization are feasible options for splenic artery aneurysms, avoiding the need for open surgery. Technical success of endovascular repair has been reported to be high in small sample studies. However larger studies on technical success are lacking and short and long-term patencies are non-existent in the literature.

CO-10
RUPTURED RENAL ANEURYSM – CASE REPORT

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Introduction: Renal artery aneurysms (RAA) are uncommon, with an estimated incidence close to 1% in recent studies. Most are asymptomatic and often found as incidental imaging findings.

There are no specific guidelines for its treatment, although the most currently accepted indications include the presence of symptoms, diameter > 2cm and women with RAA who pretend to become pregnant, given the high risk of rupture.

Objective: The aim of this study is to present a clinical case of ruptured renal aneurysm treated by an endovascular technique.

Results: A 67-year old man who had a medical history of hypertension, diabetes mellitus type 2, dyslipidemia, atrial fibrillation and chronic renal disease on hemodialysis (brachiocephalic fistula on the left upper limb). He presented with an intermittent lumbar pain with 3 weeks evolution, purpuric lesions (face, hands and lower limbs), fever and increased inflammatory parameters. The inicial CT-Angio revealed a right renal artery aneurysm (mid artery, diameter 25mm) with signs of contained rupture and surrounding soft tissue densification. The transthoracic and transesofagic echocardiography were no images of vegetations or abscesses and mycological and immunologic study were negative. He started broad spectrum antibiotic and was submitted in the third day of hospitalization to aneurysm embolization with five coils (8x10mm) and placement of a Amplatzer vascular plug II (8x7mm) in the right renal artery ostium with complete exclusion of renal perfusion. The day after the procedure he had no pain. Hemocultures were positive to Staphylococcus aureus with a probable starting point in the fistula (history of repeated punctures in single location). The patient was discharge in 5th postoperative day, asymptomatic and without analytical changes. Follow-up 6 months CT-Angio revealed complete exclusion of aneurysm without images of surrounding soft tissue densification.

Conclusion: Although there are some cases described in the literature of renal artery aneurysm rupture, this is a pathology increasingly found by the available imaging resources.

In this case, being a patient on hemodialysis, embolization of the renal artery with exclusion of the kidney perfusion proved to be the most appropriate treatment.

CO-11
GIANT ANASTOMOTIC FEMORAL PSEUDOANEURYSM

Ricardo Correia (Portugal)[1]; Ana Garcia (Portugal)[1]; Rita Ferreira (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Rita Bento (Portugal)[1]; Maria E. Ferreira (Portugal)[1]

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Introduction: Aortobifemoral bypass (ABFB) has classically the better long-term patency among lower limb revascularization procedures. However, late complications are fearsome, despite rare. Pseudoaneurysm rupture can threaten patient life. It's location in previously treated anatomic areas challenges its conventional surgical approach.

Methods: This is a case-report of a patient referenced to a vascular surgery emergency department of a tertiary hospital with late femoral anastomotic pseudoaneurysm. This work aims to alert for this classic procedure late complication and to present possible surgical resolutions.

Results: Male patient, 59 years, underwent ABFB and above-the-left knee amputation in 2005 due to bilateral critical lower limb ischemia caused by aorto-iliac occlusive disease. Ensuing prosthesis right limb occlusion was corrected with a left femoral - to - right femoral bypass. Patient went to emergency department because of anorexia and general weakness. He had a severe anemia and huge abdominal hematoma in relation with pulsatile inguinal bulging (Fig.1). Angio-CT showed left femoral anastomotic pseudoaneurysm with large abdominal wall hematoma (Fig.2).

Patient underwent urgent procedure:

1) Left limb ABFB prosthesis endoclamping (left umeral access);

2) Hematoma drainage;

3) Identification of anastomotic dehiscence between crossover and ABFB left limb prosthesis;

4) Interposition graft with silver-coated Dacron prosthesis.

Postoperative follow-up: wound dehiscence and infection; prosthesis infection, septic shock and death (1 month after ER presentation).

Conclusions: Conventional open surgery continues to be the dominant modality in anastomotic femoral pseudoaneurysm treatment. However, balloon endoclamping may be an useful helper in proximal control in a previously treated anatomic area. The principles of prosthesis infection surgical treatment should be followed: prosthesis removal, surgical debridement, and vascular reconstruction using autologous grafts or extra-anatomic bypass. However, high morbi-mortality rates related to this definite procedure in non-fit patients may force to damage-control procedures, as in the above mentioned case-report.

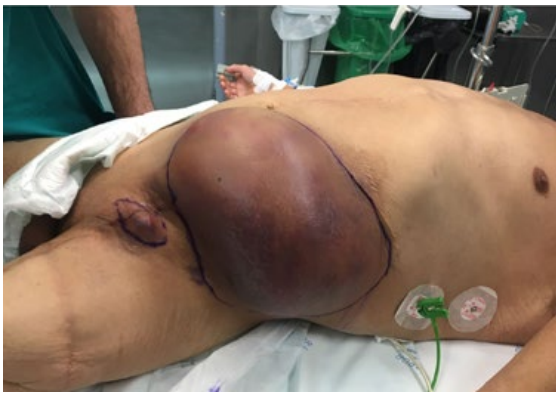

Fig.1 Abdominal Wall Hematoma

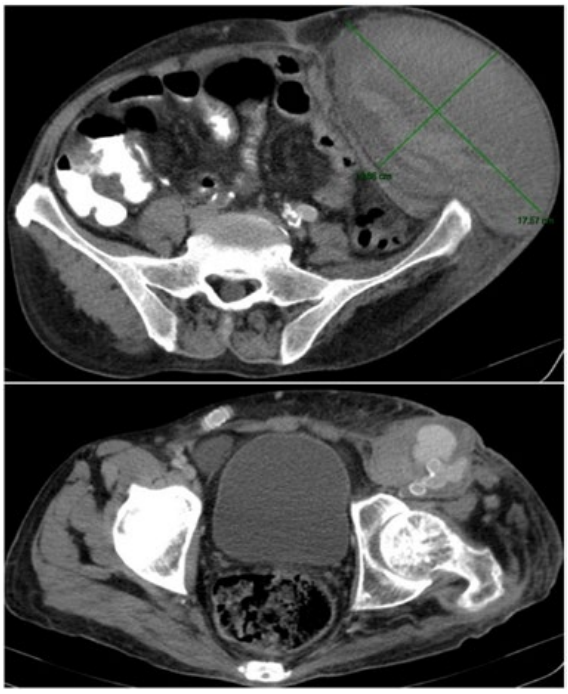

Fig 2. AngioCT- Abdominal Wall Hematoma originating in anastomotic left pseudoaneursm

CO-12

COVERED STENT EXCLUSION OF A CELIAC ARTERY ANEURYSM

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Introduction: Visceral aneurysms are a rare clinical entity with an incidence estimated on 0.1% to 2% in the general adult population. These include aneurysms affecting the celiac artery, superior and inferior mesenteric artery and any one of the branches of these arteries. Most frequently affected arteries are the splenic and common hepatic. Celiac artery is affected in under 4% of all visceral aneurysms, with around 100 cases reported in the literature. Most true aneurysms are due to atherosclerosis, while pseudoaneurysms are mainly secondary to infectious or inflammatory conditions. Endovascular treatment is supported as the first line approach to treat these aneurysms by most authors, essentially with embolization (coils and glue).

We describe a case of celiac artery aneurysm treated with a covered stent.

Objectives: To report a case of celiac artery aneurysm treated with an endovascular approach and to review current literature.

Methods: The authors report a clinical case and present a literature review using PubMed with the terms "celiac artery aneurysm", "visceral aneurysm", "endovascular treatment" and "covered stent" as major topics. The bibliography of relevant articles has been checked to identify other significant papers.

Results: A 82-year-old man, with a medical history of hypertension, dyslipidemia and aortic valve replacement and ascending aorta reconstruction due to major aortic insufficiency and ascending aorta aneurysm, has been diagnosed with celiac artery aneurysm in abdomino-pelvic computed tomography (CT) during the investigation of dyspepsia complaints. A detailed study with CT angiography (CTA) identified a 24mm true aneurysm of the median portion of the celiac artery (figure 1). The patient denied any other complaints, besides the dyspepsia. Physical examination was normal. Under general anesthesia and systemic anticoagulation, the patient was submitted to the placement of balloon-expandable covered stents on the celiac artery. Braquial surgical access was chosen due to the expectable tortuosity through the femoral approach. Final angiography showed aneurysm exclusion and permeability of the splenic and common hepatic arteries, without

endoleaks or dissections (figure 2). The postoperative period was uneventful. The six month control CTA showed the exclusion of the celiac artery aneurysm with considerable size reduction and good permeability of the stents and splenic and common hepatic arteries.

Conclusion: Celiac artery aneurysms are an extremely rare condition that are mainly treated with coils embolization. Our case report demonstrates a successfully aneurysm exclusion using covered stents with the advantage of maintaining normal flow to the visceral circulation.

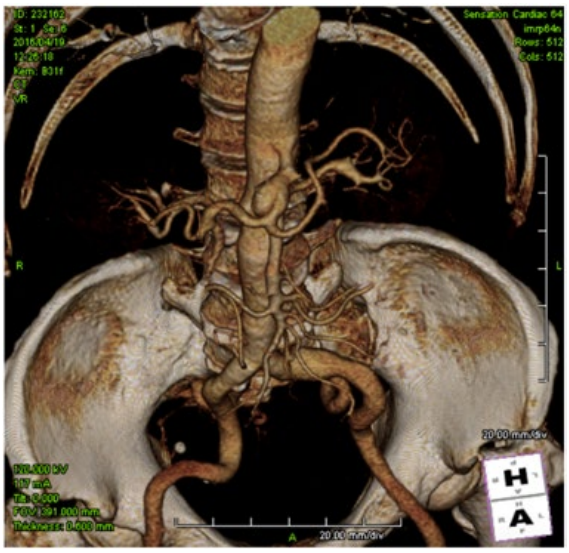

Fig. 1

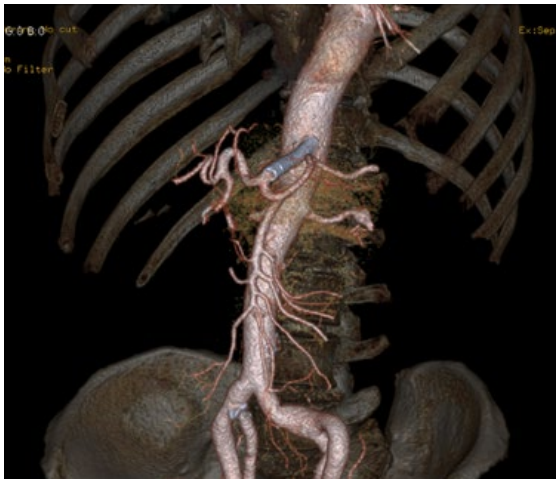

Fig. 2

CO-13

RADICAL NEPHROURETERECTOMY AND INTERAORTOCAVAL CONGLOMERATE EXCISION – A MULTIDISCIPLINAR APPROACH

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Introduction: Upper urinary tract malignant neoplasms are rare, comprising 8% of urinary tract tumors. Ninety percent of them are urothelial tumors. Advancing age, smoking and chronic analgesic abuse are their main risk factors.

Objectives: The authors present an advanced urothelial neoplasm with a large interaortocaval adenopathic conglomerate that underwent multidisciplinary complete surgical resection.

Materials and Methods: A fifty-nine year old smoking male was referred to the urology department due to a right flank pain starting one month earlier and resistant to conventional analgesia. The CT for the workup of this patient revealed a neoplasm of the right renal pelvis with a proximal ureteral wall contrast-enhancing thickening and an interaortocaval adenopathic conglomerate encircling the main right renal artery. No further metastatic lesions were apparent, namely pulmonary.

After a multidisciplinary consultation and discussion, a right radical nephroureterectomy and retroperitoneal lymph node dissection were performed. The pararrenal aorta and left renal vein were isolated via a transperitoneal approach and the right renal artery was ligated at its root in the aorta. After a Kocher maneuver, the right radical nephroureterectomy and perimeatic cystectomy were performed. The vena cava was isolated and freed starting at the iliac confluence through its subhepatic portion. The retroperitoneal lymph node dissection was conducted, including the subhepatic lymph node mass, which was removed en bloc with the right renal artery stump.

No perioperative complications were observed and the patient was discharged 6 days after the surgery.

Results: The pathology report described an urothelial carcinoma of the right renal pelvis, pT3N2M0, with renal parenchymal infiltration and 5 metastatic (out of 19 resected) lymph nodes. The patient is currently undergoing systemic chemotherapy (gemcitabine plus cisplatin).

Conclusion: Vascular and urology multidisciplinary collaboration allowed a successful thorough resection of an advanced urothelial neoplasm without perioperative complications.

CO-14
PERCUTANEOUS MECHANICAL THROMBECTOMY: NEW WEAPON IN THE TREATMENT OF ACUTE MESENTERIC ISCHEMIA

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Introduction: The diagnosis of acute mesenteric ischemia (AMI) remains challenging, due to nonspecific symptoms and signs that lead to a high mortality rate. Common causes include emboli from cardiac origin and thrombosis of a mesenteric plaque.

Objective: To present a clinical case of acute mesenteric ischemia that underwent successful endovascular revascularization.

Methods/ Clinical report: A 82 year-old woman with a history of atrioventricular block, hypertension and dementia, was admitted to the emergency room with an acute abdominal condition with 3 days of evolution. Diagnosis of ischemic colitis secondary to acute superior mesenteric artery occlusion was confirmed with angiotomography.

An endovascular treatment was planned: mechanical thromboembolectomy with yhe Rotarex system, by left brachial access. The patient had symptomatic improvement, with discharge at day sixth, with no need of exploratory laparotomy.

Discussion: AMI is a vascular emergency whose treatment should be as timely as possible. For mesenteric revascularization we have two options: open or endovascular. Some authors have demonstrated an advantage in the endovascular approach, with reduced morbidity and mortality, especially in an often aging and frail group of patients.

The Rotarex system fragments the thrombus and aspirates it at the same time, thus avoiding embolic phenomena at distance. Despite being a recent system, it seems to be a very promising tool for AMI treatment, due to fast restoration of blood flow with minimal invasiveness.

CO-15
ENDOVASCULAR TREATMENT OF A PATIENT WITH AN ANASTOMOTIC PSEUDOANEURYSM FOLLOWING OPEN ABDOMINAL AORTIC ANEURYSM REPAIR

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Introduction: The management of anastomotic pseudoaneurysms after abdominal aortic aneurysm open repair is challenging due to the difficulty associated with a redo open surgery. We present the case of a patient treated with an abdominal aortic endograft.

Methods: An 84-years old male, smoker, with hypertension, hyperuricemia, history of coronary angioplasty stenting for acute myocardial infarction and previous open infrarenal abdominal aortic aneurysm repair. At the time, the patient was submitted to partial aneurysmectomy with interposition of an aortic graft.

After 9 years, the patient presents with abdominal pain associated with a sudden sensation of an abdominal pulsation. The patient had no complaints of calf claudication or in the extremities. At physical examination, he presented with a palpable pulsatile mass in the umbilical and left lumbar quadrants and palpable femoral pulses.

The AngioCT revealed a pseudoaneurysm of the distal aortic anastomosis with 6,1cm of greater diameter and a left common iliac aneurysm with 3,7cm of greater diameter.

Results: The patient was submitted to exclusion of the anastomotic pseudoaneurysm and left common iliac aneurysm with an aortouniliac endograft with extension to the left external iliac artery plus a femorofemoral crossover bypass with PTFE.

The procedure underwent with no complications and the final angiography confirmed the exclusion of the aneurysm. The patient was discharged home after 4 days with single antiplatelet therapy.

At the follow-up the patient is asymptomatic and the angioCT confirmed the exclusion of the aneurysms with no endoleaks.

Conclusion: In this case, the endovascular approach of an anastomotic pseudoaneurysm following abdominal aortic open surgery was a safe procedure, associated with a low morbidity and with no complications during the follow-up period.

CO-16
APTUS – A TYPE IA ENDOLEAK SOLUTION

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Introduction: Endoleaks are the most common complication of EVAR. Of these, type Ia Endoleak is further associated with a high risk of aneurysmal expansion and consequent secondary rupture.

Traditionally, aortic cuff and / or Giant Palmaz Stent are the treatment options for type Ia Endoleak.

FDA-approved, since 2011, the Heli-FX EndoAnchor system (Aptus Endosystems) has emerged as an alternative for the treatment of Endoleak type IA, whose mechanism consists of "anchoring" or "screwing" the prosthesis to the aortic wall in order to obtain better apposition /sealing.

Case report: A patient went to the emergency department for abdominal pain, having performed Angio TC and submitted to aorto-bi-iliac EVAR - Endurant II 32x124 by right femoral acess + iliac bifurcation extension 16x16 + 16x13x80 + left iliac bifurcation extension 16x13.

The control angiography revealed a type Ia endoleak, solved by the deployment of 7 endoanchors.

Conclusion: The use of EndoAnchors to treat type Ia Endoleak and endograft migration has been successful in several clinical studies and has shown a higher rate of aneurysm sac regression and suggest its use in the treatment of patients with challenging proximal aneurysm anatomy proposed to EVAR.

Thus, prophylactic use of EndoAnchors in patients with hostile aortic neck anatomy seems promising, but definitive findings should await long-term data.

CO-17
MEDIAN ARCUATE LIGAMENT SYNDROME – CLINICAL CASE

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[1] Centro Hospitalar Tâmega e Sousa

Introduction: Median arcuate ligament syndrome (MALS) is rare and consisting of compression of the celiac artery by a fibrous band of the diaphragm. It is observed, in 10 -24% of the population, becoming symptomatic only in a small group of people.

We report a case of MALS presenting with gastric ischemia and discuss the challenges of this diagnosis.

Clinical case: A 58-year-old male patient went to the emergency department complaining of three-day onset epigastric abdominal pain associated with vomiting and diarrhea. The physical exam and blood tests were unremarkable despite the severity of the complaints.

During surveillance in the emergency room, he gradualy developed signs of sepsis of abdominal origin. Prompt resuscitation was initiated and an abdominal CT scan was performed, revealing signs of gastrointestinal ischemia (gastric and intestinal distension and pneumatosis associated with portal venous gas). The patient's condition improved and follow-up imaging showed regression of gastric and intestinal pneumatosis and evidence of, showing a celiac trunk severe stenosis. The abdominal Doppler ultrasound confirmed a hemodynamic significant stenosis at this anatomic point.

He underwent surgical section of the arcuate ligament, through a laparoscopic procedure, that was uneventful. At 9 months follow-up the patient remains asymptomatic.

Discussion: Incidence of MALS is 2/100 000, more common in females with increased incidence, between 30-50 years of age. The classical triad of characterizes this syndrome includes postprandial abdominal pain, weight loss and epigastric bruit.

MALS is usually regarded as an exclusion diagnosis, confirmed by imaging tests. The most consensual treatment is surgical decompression of the stenosis, being the laparoscopic route the most consensual at the moment with success rates ranging between 60-79%.

CO-18
INFERIOR VENA CAVA TRANSPOSITION AND JUXTARENAL AORTIC OCCLUSION - SURGICAL DILEMMA (CASE REPORT)

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Introduction/Objective: The inferior vena cava (IVC) is formed by a complex process of embryogenesis (6th – 8th week of gestation) which inadvertently may result in four anatomic anomalies: duplication of the inferior vena cava, transposition/left-sided inferior vena cava, retroaortic

left renal vein and circumaortic left renal vein. IVC transposition (prevalence of 0,17 – 0,5% of the general population) consists of an IVC to the left of the aorta that crosses to the right side, usually anterior to the aorta at the level of the renal arteries. It's usually asymptomatic but there's an association with deep venous thrombosis and right isomerism or asplenia syndrome. These congenital anomalies are rare but may cause serious complications during abdominal aortic surgery. The aim of this presentation is of awareness and discussion of the treatment options of concomitant IVC transposition and aortic occlusive disease.

Material and Methods: Case report: male, 52 years old, heavy smoker, construction worker; severe claudication with a significant impact in daily life (Leriche-Fontaine IIb/ Rutherford 3); pre-operative study made by angiography with evidence of a juxtarenal aortic occlusion; low surgical risk; surgical proposal: aortobifemoral bypass.

Results: The patient was submitted to a median laparotomy: after opening the retroperitoneu and while dissecting and isolating the abdominal aortic artery, a left-sided inferior vena cava was found, compatible with an IVC transposition. Bypass was not performed.

Discussion and conclusion: The IVC transposition increases the risk of endovascular procedures or abdominal aortic surgery, mainly in juxtarenal aortic occlusion. Complications may include renal arteries embolization and difficult exposure of the aorta just below the level of these same arteries. Ligation and division of the IVC causes chronic lower leg edema but subsequent repair of the IVC, following aortic reconstruction, is also a major challenge. A preoperative CT scan is not always routinely performed for aortoiliac occlusive disease and so intraoperative awareness is important to prevent unexpected venous injuries. In this case, the surgeon option was not to perform the revascularization, considering the surgical risks and the symptons. The best medical treatment was optimized and the patient is clinically stable.

CO-19

LATE PSEUDOANEURYSM FOLLOWING UPPER LIMB ORTHOPEDIC SURGERY: 2 CASE REPORTS

Ricardo Correia (Portugal)[1]; Ana Garcia (Portugal)[1]; Rita Ferreira (Portugal)[1]; Nelson Camacho (Portugal)[1]; Joana Catarino (Portugal)[1]; Rita Bento (Portugal)[1]; Maria E. Ferreira (Portugal)[1]

[1] Hospital de Santa Marta, CHLC

Introduction: Vascular iatrogenic trauma after orthopedic surgery is usually described in spinal, hip and knee procedures. Most arterial injuries will be apparent during or shortly after the procedure, through pain, bleeding and/or ischemia. Pseudoaneurysms usually have a late presentation, as a pulsating mass or less obviously as pain ou edema in obese patients. Initial diagnosis depends on a high degree of clinical suspicion and is usually confirmed by ultrasound duplex scan.

Methods: This is a case-report of 2 patients referenced to a vascular surgery emergency department of a tertiary hospital with late iatrogenic upper limb pseudoaneurysm following an orthopedic procedure.

Results: ***Patient 1*** - Female, 89 years, autonomous, presented with mechanical upper right arm pain. US showed a large umeral pseudoaneurysm from a large defect in the umeral artery wall, in relation to a bone screw tip inside pseudoaneurysm cavity, confirmed by angio-CT (Fig.1). 8 years ago, she underwent umeral bone repair with an umeral endomedular nail with locking screws, and 2 months before our observation she underwent a right umeral thrombectomy after presumed embolic acute ischaemia. Patient underwent open artery repair with an end-to-end anastomosis; mobile screw tip inside pseudoaneurysm cavity was verified and fully covered with soft tissue.

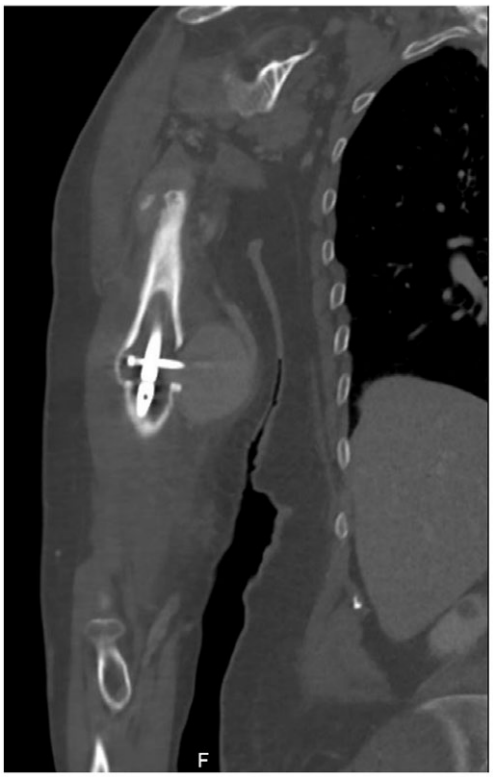


Fig. 1 – Screw protruding numeral pseudoaneurysm

Patient 2 - Male, 56 years, autonomous, presented with a palpable 3 cm pulsating mass in lower third of left forearm. 1 month before, he underwent forearm bone surgery (after ulnar and radial fracture following a car accident). US showed a radial pseudoaneurysm from a large defect in radial artery wall (Fig.2). He underwent open surgery with pseudoaneurysm resection and artery

repair using cephalic vein interposition graft. At 1 month evaluation, both patients present distal pulses and no signs of previous vascular complication.

Conclusion: Multiple management strategies can be applied to pseudoaneurysms, from ultrasound compression to thrombin injection, endovascular intervention or open surgery. Upper limb arteries are superficial, can be approached quickly and surgery may be performed under local anesthesia. Therefore, open surgery is still the treatment of choice in umeral, ulnar and radial arteries injuries. The conventional approach in psuedoaneurysm management has been direct approach to the lesion, followed by arteriorrhaphy in small defects, and arterial ligation or lesion resection and arterial repair with an end-to-end anastomoses or venous interposition graft in large defects.

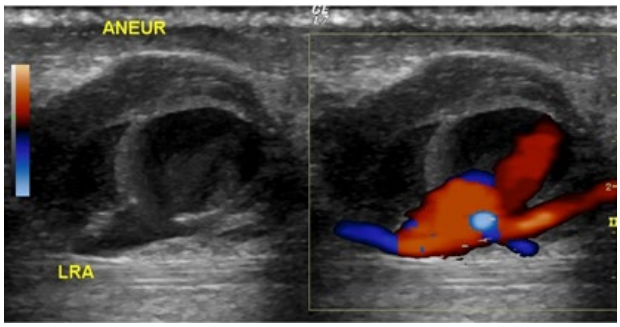


Fig. 2 – Arm US

CO-20
SPONTANEOUS RUPTURE OF LEFT COMMON ILIAC ARTERY SECONDARY TO PENETRATING ATHEROSCLEROTIC ULCER

Vânia Constâncio (Portugal)[1]; Luís Antunes (Portugal)[1]; Gabriel Anacleto (Portugal)[1]; Ricardo Vale Pereira (Portugal)[1]; Óscar Gonçalves (Portugal)[1]

[1] Centro Hospitalar e Universitário de Coimbra

The penetrating atherosclerotic ulcer (PAU) is a focal ulcerative lesion that develops in the region of an atheromatous plaque that penetrates the internal elastic lamina of the vascular wall and is mainly associated with intramural hematomas, aneurysms and dissection. It`s more frequent in men with dyslipidemia, arterial hypertension and smoking habits between the 7th and 8th decade of life. Although it may affect the aorta, iliac and femoral arteries, it`s more common in the descending thoracic aorta and rare in the ascending aorta and aortic arch. Iliac or femoral PAU is much less prevalent when compared to aortic PAU (0,3% vs. 0,48%), usually occurs on the right and is diagnosed in asymptomatic patients. It`s acute presentation with rupture is very rare.

We describe a case of a 79 year-old white male with a background of arterial hypertension, admitted to our emergency department with abdominal hypogastric complaints evolving over the previous 48 hours. On admission he was hemodynamically stable, with physical findings of global abdominal tenderness and palpable lower extremities pulses bilaterally. The blood work revealed high white cell count and 11,1mg/dL hemoglobin. The CT-scan study revealed a retroperitoneal hematoma with 14x8cm with rupture of the left iliac bifurcation. The artery revealed several atherosclerotic lesions without aortic or iliac aneurysm. The patient was promptly submitted to an endovascular procedure with embolisation of the left internal iliac artery followed by exclusion of the ruptured artery with 2 Endurant II (Medtronic®) prosthesis (16x16x82mm and 16x13x82mm). No complications occurred and after 3 months follow-up the patient is clinically well and control abdominopelvic CT- scan showed residual retroperitoneal hematoma with no endoleak.

Most patients with PAU are asymptomatic, have no need for surgical treatment and the recommendations are for best medical care with control of risk factors. In symptomatic patients, endovascular repair has become the treatment of choice due to its excellent security profile and a technical success rate as high as 100%. Although it demands specific technical skills and patient anatomy can limit its application, this approach has substantial advantages in patients with multiple conditions, reducing morbidity and length of stay.

PRÉMIO PROFESSOR AMÉRICO DINIS DA GAMA

REGULAMENTO

Artigo 1

A Sociedade Portuguesa de Cirurgia Cardiotorácica e Vascular (SPCCTV) tem como um dos seus objetivos apoiar e fomentar a excelência da investigação e publicação científicas. Assim, resolveu materializar esse intuito na criação de um prémio anual de investigação dirigido a trabalhos nacionais publicados na Revista da SPCCTV. A SPCCTV e o Corpo Editorial da Revista da SPCCTV instituíram assim o "Prémio Professor Américo Dinis da Gama", com patrocínio da Abbott.

Artigo 2

Este Prémio destina-se a galardoar o melhor trabalho de investigação no domínio da Cirurgia Cardíaca, Torácica ou Vascular, no valor de 2.500 euros.

Artigo 3

Os trabalhos devem ser originais, e deverão ter sido publicados no ano anterior na Revista da SPCCTV.

Artigo 4

Sendo o objetivo deste prémio incentivar o espírito de investigação nacional, os autores dos trabalhos concorrentes terão de ser maioritariamente portugueses. Entre os autores do trabalho deverá existir um sócio da SPCCTV no pleno uso dos seus direitos.

Artigo 5

Os trabalhos devem ser realizados pelo menos em parte em Portugal, podendo ser realizados parcialmente no estrangeiro / em colaboração com instituições estrangeiras, caso o investigador principal seja português.

Artigo 6

Não são considerados trabalhos premiados de outra forma.

Artigo 7

O Júri do Prémio será designado pela Direcção da SPCCTV, tendo em conta as seguintes considerações: 1. Os concorrentes ou elementos do mesmo serviço não podem integrar o Júri; 2. O Júri é constituído por 5 (cinco) elementos, que deverão ser sócios da SPCCTV, sendo o Presidente do Júri designado de entre os membros da Direcção da SPCCTV. Caso estes estejam impedidos de fazer parte do júri pelo referido no ponto anterior, o presidente do Júri será nomeado por votação pelos membros do Júri; 3. As decisões do Júri serão tomadas por maioria absoluta de votos, devendo ser lavrada uma ata que será assinada por todos e enviada à Direcção da SPCCTV; 4. O Presidente do Júri tem voto de qualidade; 5. Das decisões do Júri não há recurso; 6. Cada elemento do Júri distribuirá as classificações de 10-8-5-3-1 por 5 trabalhos pré-selecionados pelo Corpo Editorial e Direcção da SPCCTV.

Artigo 8

Este prémio não é acumulável com outros prémios da SPCCTV.

Artigo 9

A proclamação e atribuição dos prémios será efectuada por ocasião do Congresso da SPCCTV, em cerimónia a anunciar que contará com a direção da SPCCTV, Corpo Editorial da Revista da SPCCTV e representantes da Abbott.

Artigo 10

Qualquer situação não prevista neste regulamento será definida pela Direcção da SPCCTV.


SPCCTV

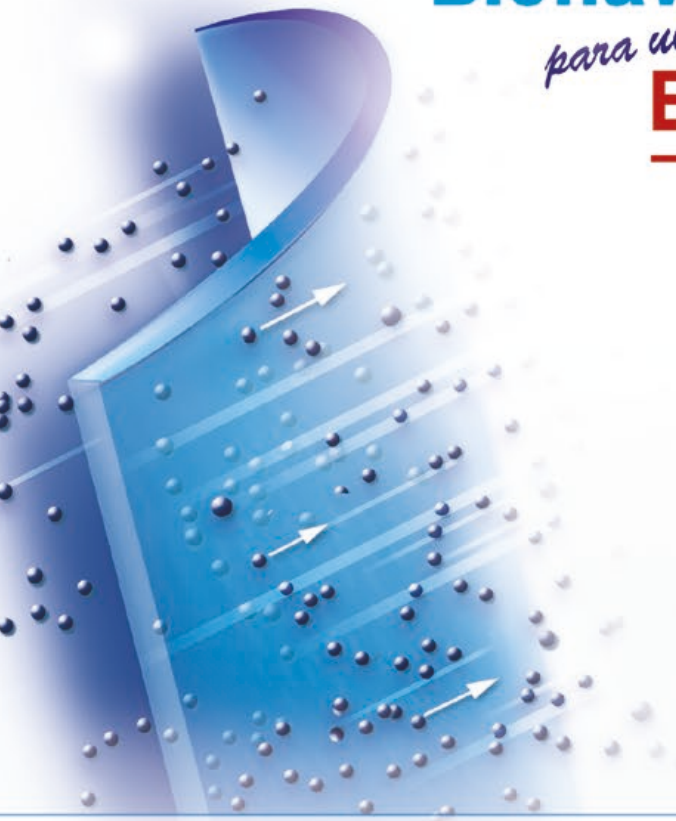
daflon® 500

Bioflavonoides - Fração Flavonóica Purificada Micronizada

Bioflavonoides micronizados[1]

para uma

ELEVADA EFICÁCIA CLÍNICA[2]



Doença venosa crónica
Doença hemorroidária

2 a 6 comp./dia

INFORMAÇÕES ESSENCIAIS COMPATÍVEIS COM O RESUMO DAS CARACTERÍSTICAS DO MEDICAMENTO | NOME DO MEDICAMENTO*: Daflon 500. **COMPOSIÇÃO*:** Bioflavonoides (Fração flavonóica purificada micronizada). Cada comprimido revestido por película de 500 mg contém: 90% de diosmina, ou seja 450 mg por comprimido revestido por película; 10% de flavonoides expressos em hesperidina, ou seja 50 mg por comprimido revestido por película. **FORMA FARMACÊUTICA*:** Comprimido revestido por película, cor de salmão e de forma oval. **INDICAÇÕES TERAPÊUTICAS*:** Tratamento dos sintomas e sinais relacionados com a insuficiência venosa (pernas pesadas, dor, cansaço, edema). Tratamento sintomático da crise hemorroidária. **POSOLOGIA E MODO DE ADMINISTRAÇÃO*:** Posologia habitual: 2 comprimidos revestidos por película por dia. Na crise hemorroidária: nos 4 primeiros dias: 6 comprimidos revestidos por película repartidos em 3 tomas; nos 3 dias seguintes: 4 comprimidos revestidos por película repartidos em 2 tomas; em seguida voltar à posologia de manutenção: 2 comprimidos revestidos por película por dia. **CONTRAINDICAÇÕES*:** Hipersensibilidade à substância ativa ou a qualquer um dos excipientes. **ADVERTÊNCIAS E PRECAUÇÕES ESPECIAIS DE UTILIZAÇÃO*:** A administração deste medicamento no tratamento sintomático da crise hemorroidária não substitui o tratamento de outros problemas anais. Se não houver remissão dos sintomas, deve ser consultado um médico de forma a proceder-se ao exame proctológico e à revisão do tratamento, caso haja necessidade. **INTERAÇÕES MEDICAMENTOSAS E OUTRAS FORMAS DE INTERAÇÃO*:** Não foram realizados estudos de interação. **FERTILIDADE, GRAVIDEZ E ALEITAMENTO*:** Gravidez: O tratamento deve ser evitado. Estudos experimentais no animal não evidenciaram efeito teratógeno. Na espécie humana, até hoje, não foram referidos efeitos adversos. Amamentação: Na ausência de dados sobre a excreção no leite materno o tratamento deve ser evitado durante a amamentação. Fertilidade: Estudos de toxicidade em ratos machos e fêmeas não mostraram efeitos na fertilidade. **EFEITOS SOBRE A CAPACIDADE DE CONDUZIR E UTILIZAR MÁQUINAS*. EFEITOS INDESEJÁVEIS*:** Frequentes: diarreia, dispepsia, náuseas, vómitos. Pouco frequentes: colite. Raros: tonturas, cefaleias, mal-estar geral, erupções cutâneas, prurido, urticária. Frequência desconhecida: dor abdominal, edema isolado da face, dos lábios e das pálpebras. Excecionalmente edema de Quincke's. **SOBREDOSAGEM*:** Não foram descritos casos de sobredosagem. Em caso de sobredosagem acidental, aplicar as medidas básicas de emergência para estas situações. **PROPRIEDADES FARMACOLÓGICAS*:** Daflon 500 exerce uma ação sobre o sistema vascular de retorno: ao nível das veias, diminui a distensibilidade venosa e reduz a estase venosa; ao nível da microcirculação, normaliza a permeabilidade capilar e reforça a resistência capilar. **APRESENTAÇÃO:** Caixa de 60 comprimidos revestidos por película. **TITULAR DA AIM:** Servier Portugal - Especialidades Farmacêuticas, Lda. Av. António Augusto de Aguiar, 128, 1069-133 LISBOA. Tel: 213122000. Para mais informações deverá contactar o titular de AIM. Daflon 500 é um **MNSRM**. RCM aprovado em 07.2015. IECRCM 02.03.2018.

*Para uma informação completa por favor leia o Resumo das Características do Medicamento.

18DAF01

1. Dossier de Registo aprovado
2. Garner R C et al, ***Journal of Pharmaceutical Sciences***, 2002; 91, 1:32-40.

SERVIER

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Av. António Augusto de Aguiar, 128. 1069-133 LISBOA Telefone: 21 312 20 00 - Fax: 21 312 20 90.