



# Revista Portuguesa de CIRURGIA CARDIO-TORÁCICA E VASCULAR

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CONGRESSO  
SPCCTV  
**4D**  
VISIONS<sup>17</sup>

CARDIAC | THORACIC | VASCULAR | ANESTHESIOLOGY

FOUR PERSPECTIVES ON THE  
SAME SURGICAL PRACTICE

24 to 26 November | 2017  
Hotel Grande Real Sta. Eulália, Albufeira | Algarve

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## ESPECIAL - ABSTRACTS

Congresso da Sociedade Portuguesa  
de Cirurgia Cardiotorácica e Vascular

24 a 26 de Novembro de 2017  
Albufeira, Algarve



# Confiança que Advém da Evidência e da Experiência da Vida Real

- ◆ Doentes com Fibrilhação Auricular NV<sup>1-3</sup> e EP/TVP.<sup>4,5</sup>
- ◆ O NOAC mais prescrito em Portugal e no Mundo.<sup>6,7,8</sup>
- ◆ 23 milhões de doentes 7 indicações.<sup>7,8</sup>

Este medicamento está sujeito a monitorização adicional. *Nome:* Xarelto 2,5 mg, 10 mg, 15 mg, 20 mg. *Composição:* Cada comprimido revestido por película contém 2,5 mg, 10 mg, 15 mg ou 20 mg de rivaroxabano. *Forma Farmacéutica:* Comprimido revestido por película. *Indicações terapêuticas:* **Xarelto 2,5 mg:** Xarelto, coadministrado com ácido acetilsalicílico (AAS) isoladamente ou com AAS mais clopidogrel ou ticlopidina, é indicado para a prevenção de acontecimentos aterotrombóticos em doentes adultos após uma síndrome coronária aguda (SCA) com biomarcadores cardíacos elevados. **Xarelto 10 mg:** Prevenção do tromboembolismo venoso (TEV) em doentes adultos submetidos a artroplastia eletiva da anca ou joelho. **Xarelto 15 mg e 20 mg:** Prevenção do acidente vascular cerebral e do embolismo sistémico em doentes adultos com fibrilhação auricular não-valvular com um ou mais fatores de risco, tais como insuficiência cardíaca congestiva, hipertensão, idade  $\geq$  75 anos, diabetes mellitus, antecedentes de acidente vascular cerebral ou acidente isquémico transitório. Tratamento da trombose venosa profunda (TVP) e embolismo pulmonar (EP) e prevenção da TVP recorrente e EP em adultos. *Posologia e modo de administração:* **Xarelto 2,5 mg:** A dose recomendada é de 2,5 mg duas vezes ao dia. Os doentes também devem tomar uma dose diária de 75 - 100 mg de AAS ou uma dose diária de 75 - 100 mg de AAS em adição quer a uma dose diária de 75 mg de clopidogrel quer a uma dose diária padrão de ticlopidina. A extensão do tratamento para além dos 12 meses deve ser feita individualmente em cada doente, uma vez que a experiência até aos 24 meses é limitada. **Xarelto 10 mg:** 10 mg de rivaroxabano, administrados, por via oral, uma vez ao dia. A posologia inicial deve ser administrada 6 a 10 horas após a cirurgia, desde que a hemostase tenha sido estabelecida. A duração do tratamento depende do risco individual do doente para tromboembolismo venoso, a qual é determinada pelo tipo de cirurgia ortopédica. Grande cirurgia da anca: tratamento de 5 semanas. Grande cirurgia do joelho: 2 semanas. Se for esquecida uma dose, o doente deverá tomar Xarelto imediatamente e depois continuar no dia seguinte com a toma uma vez ao dia, tal como anteriormente. **Xarelto 15 mg e 20 mg:** Prevenção do acidente vascular cerebral e do embolismo sistémico: A dose recomendada, que também é a dose máxima recomendada, é de 20 mg uma vez por dia. No caso de esquecimento de uma dose, o doente deve tomar imediatamente Xarelto e continuar no dia seguinte com a toma uma vez ao dia, conforme recomendado. Não deve ser tomada uma dose a dobrar no mesmo dia para compensar uma dose esquecida. *Tratamento da TVP, tratamento do EP e prevenção da TVP recorrente e EP:* A dose recomendada para o tratamento inicial da TVP aguda ou EP é de 15 mg duas vezes por dia durante as primeiras três semanas, seguida de 20 mg uma vez por dia para continuação do tratamento e prevenção da TVP recorrente e EP. No caso de esquecimento de uma dose durante a fase de tratamento de 15 mg duas vezes por dia (dia 1 - 21), o doente deve tomar imediatamente Xarelto para assegurar a toma de 30 mg de Xarelto por dia. Neste caso podem tomar-se dois comprimidos de 15 mg ao mesmo tempo. O doente deve continuar no dia seguinte a toma diária e regular de 15 mg duas vezes por dia, conforme recomendado. No caso de esquecimento de uma dose durante a fase de tratamento de uma toma diária (dia 22 e seguintes), o doente deve tomar imediatamente Xarelto e continuar no dia seguinte com a toma diária, conforme recomendado. Não deve ser tomada uma dose a dobrar no mesmo dia para compensar uma dose esquecida. **Xarelto 15 mg e 20 mg:** *Passagem de Antagónistas da Vitamina K (AVK) para Xarelto:* Em doentes tratados para prevenção do acidente vascular cerebral e embolismo sistémico, o tratamento com AVK deve ser interrompido e a terapêutica com Xarelto deve ser iniciada quando o INR for  $\leq$  3,0. Em doentes tratados para TVP, EP e na prevenção da recorrência, o tratamento com AVK deve ser interrompido e a terapêutica com Xarelto deve ser iniciada assim que o INR for  $\leq$  2,5. **Xarelto 2,5 mg, 10 mg, 15 mg e 20 mg:** Durante a passagem de doentes de AVK para Xarelto, os valores do INR estarão falsamente elevados após a toma de Xarelto. O INR não é uma medida válida para determinar a atividade anticoagulante de Xarelto, e portanto não deve ser utilizado. *Passagem de Xarelto para os Antagónistas da Vitamina K (AVK):* Em doentes que passam de Xarelto para um AVK, o AVK deve ser administrado simultaneamente até o INR ser  $\geq$  2,0. Durante os dois primeiros dias do período de passagem, deve utilizar-se a dose inicial padrão do AVK, seguida de uma dose do AVK com base nas determinações do INR. Enquanto os doentes estiverem a tomar simultaneamente Xarelto e o AVK, o INR não deve ser determinado antes das 24 horas após a dose precedente de Xarelto e antes da dose seguinte. *Passagem de anticoagulantes parentéricos para Xarelto:* Em doentes atualmente a serem tratados com um anticoagulante parentérico, interromper o anticoagulante parentérico e iniciar Xarelto 0 a 2 horas antes da hora prevista para a administração seguinte do medicamento parentérico (ex.: HBPM) ou na altura da interrupção de um medicamento parentérico em administração contínua (ex.: heparina não fracionada intravenosa). *Passagem de Xarelto para anticoagulantes parentéricos:* Administrar a primeira dose do anticoagulante parentérico na altura em que deve ser tomada a dose seguinte de Xarelto. Não é necessário ajuste posológico; compromisso renal ligeiro, população idosa, sexo, peso corporal. Não é recomendada a utilização em doentes com taxa de depuração da creatinina  $<$  15 ml/min. **Xarelto 15 mg e 20 mg:** Compromisso renal moderado ou grave: Na prevenção do acidente vascular cerebral e do embolismo sistémico em doentes com fibrilhação auricular não-valvular, a dose recomendada é de 15 mg uma vez por dia; no tratamento da TVP, tratamento do EP e prevenção da TVP recorrente e EP: os doentes devem ser tratados com 15 mg duas vezes por dia durante as primeiras 3 semanas. Após isto, a dose recomendada é 20 mg uma vez por dia. A redução da dose de 20 mg uma vez por dia para 15 mg uma vez por dia deve ser considerada se o risco avaliado de hemorragia do doente se sobrepõe ao risco de TVP recorrente e EP. A recomendação para utilização de 15 mg tem por base modelos farmacocinéticos, não tendo sido estudada neste contexto clínico. **Xarelto 2,5 mg e 10 mg:** Os comprimidos podem ser tomados com ou sem alimentos. **Xarelto 15 mg e 20 mg:** Os comprimidos devem ser tomados com alimentos. **Xarelto 2,5 mg, 10 mg, 15 mg e 20 mg:** População pediátrica: não é recomendada a sua utilização em crianças com idade inferior a 18 anos. Em doentes incapazes de engolir comprimidos inteiros, o comprimido Xarelto pode ser esmagado e misturado com água ou puré de maçã imediatamente antes da utilização e administrado por via oral. O comprimido Xarelto esmagado pode também ser administrado através de sondas gástricas após confirmação da correta localização gástrica da sonda. O comprimido esmagado deve ser administrado com uma pequena quantidade de água através de uma sonda gástrica, que deve, de seguida, ser irrigada com água. **Xarelto 15 mg e 20 mg:** Após a administração de Xarelto 15 mg ou 20 mg comprimidos revestidos por película esmagados, a dose deve ser imediatamente seguida por alimentos ou por alimentação entérica. *Cardioversão:* Xarelto pode ser iniciado ou continuado em doentes que possam necessitar de cardioversão. *Contraindicações:* **Xarelto 2,5 mg, 10 mg, 15 mg e 20 mg:** Hipersensibilidade à substância ativa ou a qualquer um dos excipientes. Hemorragia ativa clinicamente significativa. Gravidez e amamentação. Doença hepática associada a coagulopatia e do embolismo sistémico clinicamente relevante incluindo doentes com cirrose com Child Pugh B e C. Lesões ou condições se consideradas como apresentando um risco significativo de grande hemorragia. Estas podem incluir úlceras gastrointestinais atuais ou recentes, presença de neoplasias malignas com elevado risco de hemorragia, lesão recente no cérebro ou na espinal medula, cirurgia cerebral, espinal ou oftálmica recente, hemorragia intracraniana recente, suspeita ou conhecimento de varizes esofágicas, malformações arteriovenosas, aneurismas vasculares ou grandes anomalias vasculares intracerebrais. O tratamento concomitante com quaisquer outros agentes anticoagulantes, ex.: heparina não fracionada (HNF), heparinas de baixo peso molecular (enoxaparina, dalteparina, etc.), derivados da heparina (fondaparinux, etc.), anticoagulantes orais (warfarina, dabigatran etexilato, apixabano, etc.), exceto nas circunstâncias específicas de mudança de terapêutica anticoagulante ou quando são administradas doses de HNF necessárias para manter aberto um acesso venoso central ou um cateter arterial. **Xarelto 2,5 mg:** O tratamento concomitante da SCA com terapêutica antiplaquetária em doentes com acidente vascular cerebral ou acidente isquémico transitório (AIT) anterior. *Advertências e precauções especiais de utilização:* **Xarelto 2,5 mg, 10 mg, 15 mg e 20 mg:** Risco hemorrágico; Compromisso renal; Os doentes com problemas hereditários raros de intolerância à galactose, deficiência de lactase lapp ou malabsorção de glucose-galactose não devem tomar este medicamento. Puncão ou anestesia espinal/epidural **Xarelto 2,5 mg:** Doentes com SCA; Doentes com antecedentes de acidente vascular cerebral ou AIT. **Xarelto 10 mg:** Cirurgia por fratura da anca; **Xarelto 15 mg e 20 mg:** Doentes com válvulas protéticas; Doentes com EP hemodinamicamente instáveis ou doentes que necessitam de trombólise ou embolectomia pulmonar; **Xarelto 2,5 mg, 15 mg e 20 mg:** Procedimentos invasivos e intervenções cirúrgicas. *Interações medicamentosas:* Inibidores do CYP3A4 e da gp-P: não é recomendada em doentes submetidos a tratamento sistémico concomitante com antimicóticos azólicos tais como itraconazol, voriconazol, posaconazol ou inibidores da protease do VIH; Anticoagulantes: deve ter-se precaução se os doentes são tratados concomitantemente com quaisquer outros anticoagulantes; AINEs/ inibidores da agregação plaquetária: deve ter-se precaução nos doentes tratados concomitantemente com AINEs (incluindo ácido acetilsalicílico) e inibidores da agregação plaquetária; Varfarina; Indutores do CYP3A4; Os parâmetros de coagulação (ex.: TP, aPTT, Heptest) são afetados. *Efeitos indesejáveis:* Anemia (incl. parâmetros laboratoriais respetivos), tonturas, cefaleias, hemorragia ocular (incl. hemorragia conjuntival), hipotensão, hematoma, epistaxe, hemoptise, hemorragia gengival, hemorragia do trato gastrointestinal (incl. hemorragia retal), dores gastrointestinais e abdominais, dispepsia, náuseas, obstipação, diarreia, vômitos, prurido (incl. casos raros de prurido generalizado), exantema cutâneo, equimose, hemorragia cutânea e subcutânea, dor nas extremidades, hemorragia do trato urogenital (incluindo hematúria e menorragia), compromisso renal (incluindo aumento da creatinina no sangue, aumento de uréia no sangue), febre, edema periférico, diminuição da força e energia de um modo geral (incl. fadiga, astenia), aumento das transaminases, hemorragia pós-procedimento (incluindo anemia pós-operatória e hemorragia da ferida), contusão, secreção da ferida, tromboцитемия (incl. aumento da contagem de plaquetas), reação alérgica, dermatite alérgica, hemorragia cerebral e intracraniana, síncope, taquicardia, xerostomia, anomalia da função hepática, urticária, hemartrose, sensação de mal-estar, aumento da bilirrubina, aumento da fosfatase alcalina no sangue, aumento da HDL, aumento da lipase, aumento da amilase, aumento da GGt, icterícia, hemorragia muscular, edema localizado, aumento da bilirrubina conjugada (com ou sem aumento concomitante da ALT), pseudoaneurisma vascular, angioedema, edema alérgico, colestase, hepatite (incl. lesão traumática hepatocelular), trombocitopenia. *Número da A.L.M.:* 5565858, 5565866, 5565874, 5132956, 5132964, 5132972, 5423918, 5423926, 5423934, 5424379, 5424403. *Data de revisão do texto:* maio 2017.

**MSR. Regime de comparticipação:** Xarelto 10mg, 15mg e 20mg (Comparticipado no Regime Geral 69%; Regime Especial 84%), Xarelto 2,5mg (não Participado). Bayer Portugal, LDA., Rua Quinta do Pinheiro, nº 5, 2794-003 Carnaxide - NIF 500 043 256. Para mais informações deverá contactar o titular da autorização de introdução no mercado

**Referências:** 1. Patel M.R., Mahaffey K.W., Garg J. et al. Rivaroxaban versus Warfarin in non-valvular atrial fibrillation. *N Engl J Med.* 2011;365(10):883-91. 2. Camm J., Amarencu P., Haas S., et al. XANTUS: A Real-World, Prospective, Observational Study of Patients Treated with Rivaroxaban for Stroke Prevention in Atrial Fibrillation. *Eur Heart J.* 2015;doi:10.1093/eurheartj/ehv466. 3. Tamayo S., Peacock F., Patel M. et al. Characterizing major bleeding in patients with non-valvular atrial fibrillation: a pharmacovigilance study of 27,467 patients taking Rivaroxaban. *Clin. Cardiol.* 2015;38(2):63-8. 4. Prins M.H., Lensing A.W.A., Bauersachs R., et al. Oral rivaroxaban versus standard therapy for the treatment of symptomatic venous thromboembolism: a pooled analysis of the EINSTEIN-DVT and PE randomized studies. *Thrombosis J.* 2013;11(1):21-5. Agno W., Mantovani L.G., Haas S., et al. XALIA: rationale and design of a non-interventional study of rivaroxaban compared with standard therapy for initial and long-term anticoagulation in deep vein thrombosis. *Thrombosis J.* 2014;12(1):16. 6. Dados de vendas mensais IMS Health MIDAS, Junho 2016. 7. Cálculo baseado nos dados de vendas mensais IMS Health MIDAS, Junho 2016. 8. Resumo das características do medicamento de Xarelto®.

# REVISTA PORTUGUESA DE CIRURGIA **CARDIO-TORÁCICA** E **VASCULAR**

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# MENSAGEM DO SECRETARIO GERAL



**Gonçalo Cabral**  
Angiologia e Cirurgia Vascular,  
Hospital Beatriz Ângelo

## Congresso SPCTV 4DVisions17: O marco de uma nova era na SPCTV

### *4DVisions17 Congress: A milestone for a new age in SPCTV*

Caros sócios,

A direção da Sociedade Portuguesa de Cirurgia Cardioriorácica e Vascular (SPCTV) assumiu o compromisso de preparar esta sociedade científica para o futuro, ultrapassando as divergências do passado.

Este compromisso fica bem patente no congresso **SPCTV 4DVisions17**, que será seguramente um marco na história da SPCTV.

Esta convicção tem origem em múltiplos aspetos, destacando-se a profunda mudança organizacional, com a estreia de um novo modelo de congresso, moderno e muito mais apelativo, com um especial enfoque na promoção das gerações mais jovens; no investimento feito na qualidade científica do programa; na promoção do evento através de estratégias de comunicação e divulgação mais ambiciosas e abrangentes, e, acima de tudo, no envolvimento pessoal dos membros da direção na organização deste evento.

Este envolvimento pessoal ultrapassou largamente o tempo dedicado à produção científica, logística e criativa do congresso **SPCTV 4DVisions17**, sendo sobretudo evidente no esforço que os membros da direção e da comissão organizadora fizeram para transmitir a todos os membros da comunidade de Cirurgiões Cardíacos, Torácicos e Vasculares que algo está diferente na SPCTV.

Estamos confiantes que o trabalho desenvolvido, a estratégia de comunicação e esta entrega pessoal, captou a atenção de inúmeros cirurgiões, que há décadas se encontravam afastados desta Sociedade Científica.

A indústria farmacêutica e de dispositivos médicos não foi exceção, e entendeu perfeitamente que a SPCTV mudou para melhor, espelhando esta confiança no suporte que nos permitiu organizar um programa científico de

elevada qualidade, facto que agradecemos sinceramente.

Esperamos que o congresso **SPCTV 4DVisions** crie, por mérito próprio, o seu lugar de destaque no panorama científico nacional, como o espaço da multidisciplinaridade por excelência. Num mundo em que a complexidade dos doentes e a evolução tecnológica não parecem ter limites, a discussão multidisciplinar parece ser a chave para resultados excecionais e para a otimização de recursos humanos e financeiros.

Ainda a pensar no futuro da SPCTV, procurámos honrar o nosso compromisso educacional, proporcionando espaços de aprendizagem dedicados aos internos, nos cursos pré-congresso e dando notoriedade aos seus trabalhos, muito para além das tradicionais comunicações livres, com tempo de antena de qualidade, em horário nobre, no espaço "Arena dos Leões".

Estes são os frutos da cooperação direta da direção da SPCTV com os Clubes de Internos de Cirurgia Cardíaca e de Cirurgia Vascular e a prova de que, dando voz aos mais jovens, podemos servir melhor os interesses de todos e em última análise dos nossos doentes.

Em nome pessoal e de toda a direção da SPCTV, obrigado pela confiança que em nós depositaram e pela participação nesta Sociedade que é de todos!

Porque, mais uma vez, juntos seremos mais fortes!

Gonçalo Cabral  
O Secretário-Geral



# EDITORIAL



**Miguel Guerra**

Serviço de Cirurgia Cardiorádica, Centro Hospitalar de Vila Nova de Gaia/Espinho, Faculdade de Medicina da Universidade do Porto, Portugal

## O Congresso! *The Meeting!*

Os eventos científicos constituem uma fonte essencial na busca e aquisição de novos conhecimentos. A sua finalidade é reunir profissionais, de uma ou várias especialidades, num local privilegiado para a troca e a transmissão de informações de interesse comum. Como tal, assumem um papel de grande importância no processo da comunicação científica que chega ao conhecimento da comunidade científica de forma mais rápida que aquela veiculada pelos meios formais de comunicação.

Este ano, o Congresso está a suscitar grande adesão e recebemos um número recorde de 94 trabalhos submetidos, distribuídos pelas 4 Especialidades (Cirurgia Cardíaca, Cirurgia Torádica, Cirurgia Vasculard e Anestesiologia). Os autores terão um espaço singular para a apresentação e divulgação dos seus trabalhos e do seu potencial, especialmente motivado pela grande interação e discussão propostas no Programa. É o momento oportuno para uma postura crítica e seletiva sobre o conteúdo científico, mas também para o encontro de novas realidades, experiências e convívências que se transformam em novas aprendizagens. Os autores terão ainda a oportunidade de aperfeiçoar os seus trabalhos científicos, após escrutínio e ampla apreciação por parte dos maiores experts nacionais e internacionais. Para além disso, é também o encontro com o estado da arte e com o espelho do panorama actual e académico da nossa

actividade. Como profissionais, somos o que publicamos e divulgamos; e publicamos principalmente o que fazemos e o que somos!

Pretendemos que o Congresso seja um espaço de dinamização de discussões e de pesquisa avançada, promovendo ainda a integração do ensino e do desenvolvimento cultural e científico na sociedade. Temos múltiplos Cursos de Formação e mais uma vez, os melhores trabalhos serão reconhecidos e premiados. A somar e pela primeira vez avançamos com a iniciativa de publicar todos os Resumos/*Abstracts* aceites para comunicação na Revista da Sociedade Portuguesa de Cirurgia Cardiorádica e Vasculard. Desta forma, todos os autores verão os seus trabalhos referenciados na Pubmed®. Esta é uma mais valia para todos nós! Esta é a nossa Sociedade!

Este é “O Congresso”!

A handwritten signature in black ink that reads "Miguel Guerra". The signature is fluid and cursive.

O Editor-Chefe | Miguel Guerra





# EDITORIAL ESPECIAL



**Álvaro Laranjeira Santos**  
Serviço de Cirurgia Cardiorrástica, Hospital de Santa Marta,  
Centro Hospitalar de Lisboa Central, Portugal

## Quatro perspetivas sobre a mesma prática cirúrgica *Four perspectives on the same surgical practice*

O Programa de um Congresso é, obviamente, o pilar onde assenta toda a sua pertinência e maisvalia científica e até filosófica, em certo sentido. Assim, fiéis às premissas de inovação e dinamização com que nos comprometemos, no sentido de estabelecer um evento referencial neste sector, propusemos à Sociedade Portuguesa de Cirurgia Cardiorrástica e Vascular (SPCCTV) abandonar o formato das suas tradicionais "Reuniões Conjuntas", apostando, ao invés, num modelo de maior amplitude e ambição, mas talvez por isso, dotado de muito maior atualidade e envolvimento interdisciplinar.

Este ano, o Congresso da SPCCTV, subjugada ao tema "4D Visions – quatro perspetivas sobre a mesma prática cirúrgica", pretende destacar a interdisciplinaridade das nossas três especialidades (Cirurgias Cardíaca, Torácica e Vascular) e a ligação a uma 4ª especialidade convidada. Como tal, e neste sentido, temos a honra de poder contar com a participação da Sociedade Portuguesa de Anestesiologia. De facto, a inovação tecnológica que hoje assistimos e a procura constante de alternativas mais simples e menos invasivas, para desafios cirúrgicoanestésicos progressivamente mais difíceis, em doentes mais complexos, será o grande tema do Congresso de 2017. O sucesso clínico está num íntimo conhecimento dos problemas e das soluções propostas, associadas a uma estreita colaboração entre as Especialidades Médicas envolvidas.

A Cirurgia Torácica, Especialidade em grande expansão, vai retomar o espaço que merece. Além de Cirurgias Torácicas, convidámos também Pneumologistas e

Pneumologistas de Intervenção, bem como Especialistas em Imagiologia e Oncologia, entre outros, representando quase todos os grandes Serviços do País. Adicionalmente, o Programa 4D Visions está desenhado de modo a que os Anestesiologistas presentes tenham sempre uma sessão com algum destaque, sobre temas anestésicos relacionados, quer na área Cardíaca, Vascular ou Torácica, evitando sobreposições. Estão presentes mais de 20 convidados estrangeiros, reputados opinion leaders nas suas áreas, para sessões Meeting the Experts. Esta tônica nas iniciativas diferenciadoras será, aliás, um dos pratos fortes do Congresso. Propomos sessões mais práticas, vídeos cirúrgicos, sessões flash e até atividades especialmente dedicadas a Internos e Estudantes de Medicina, os futuros "agentes de mudança" de todo o sector. Acreditamos que estão reunidos todos os ingredientes para um congresso diferente, mais participativo e exigente.

Bem-vindo ao  
**Congresso SPCCTV 4D Visions 2017!**

Organização do Congresso SPCCTV 4D Visions 2017

**Álvaro Laranjeira Santos**  
Vogal da Direcção da SPCCTV



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# SURVIVAL AFTER BILATERAL INTERNAL MAMMARY ARTERY IN CORONARY ARTERY BYPASS GRAFTING: ARE WOMEN AT RISK?

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**Background:** Most observational studies support long-term survival benefit after bilateral internal mammary artery (BIMA) compared with single internal mammary artery (SIMA) coronary artery bypass grafting (CABG) but data on females is scarce.

## INTRODUCTION

To compare survival and safety of BIMA versus SIMA CABG between males and females at our tertiary care center.

## METHODS

Single-center retrospective cohort including consecutive patients with at least 2 left coronary system (LCS) vessel disease who underwent isolated CABG with at least 1 IMA conduit and a minimum of 2 conduits targeting the LCS between 2004 and 2013. All-cause mortality was the primary outcome, secondary outcomes were in-hospital mortality and reoperation due to sternal wound complications (SWC). Kaplan-Meier analysis after inverse probability weighting using propensity score (IPW) was used to compare BIMA and SIMA CABG amongst genders. Results were confirmed by subgroup analysis.

## RESULTS

BIMA CABG was performed in 39% out of 2424 eligible procedures and in 27% of 460 females. No differences were found in survival after BIMA and SIMA CABG (median and maximum follow-up of 5.5 and 12 years, respectively) but a statistical interaction was observed with gender ( $P < 0.001$ ). Females who underwent BIMA CABG showed higher mortality (weighted HR in females subset: 3.16; 95%CI: 1.56–6.29,  $P = 0.001$ ). BIMA CABG showed a higher incidence of reoperations due to SWC (IPW adjusted model OR: 1.74; 95% CI: 1.16–2.60) that were mostly ascribable to males (weighted OR in males: 3.10; 95%CI: 1.74–5.51,  $P < 0.001$ ).

## CONCLUSION

Females may experience higher mortality after BIMA CABG which should be further explored.

# CABG: TO CBP OR NOT TO CBP – A PROPENSITY SCORE MATCHED SURVIVAL

Pedro Magro<sup>1</sup>; Sérgio Boshoff<sup>1</sup>; José Calquinha<sup>1</sup>; Miguel Sousa Uva<sup>1</sup>; José Neves<sup>1</sup>

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## INTRODUCTION

Over the past 3 decades two main strategies have been employed for surgical coronary revascularization (CABG): on- pump CABG with cardioplegia (ONCAB) and off-pump CABG (OPCAB). The objective of this study is to evaluate the short-term and long-term survival of the two strategies.

## METHODS

This study consists of 8-year cohort, retrospective single-center analysis with an intention-to-treat design. 2954 patients underwent CABG (OPCAB n=2123; ONCAB=831) for CAD. As these two groups were statistically different regarding several parameters, a propensity score model was applied and a more homogeneous cohort (n= 1441; OPCAB= 885; ONCAB=556) was analyzed. Univariate analysis, Kaplan-Meier curves and when appropriate a multivariate analysis was applied to the overall group and 6 subgroups: 2 vessel disease, 3 vessel disease, left stem disease, diabetic patients; patients with creatinin clearance bellow 50ml/min; and patients with body mass index above 30 kg/m<sup>2</sup>.

## RESULTS

Our study show: No difference in 30-days mortality, long-term survival (mean 71 months follow-up), AKY and stroke rates; Higher rates of bypass per patient (2.3% vs 2.8%, p<0,001) and complete revascularization (76%

vs 83%) in the ONCAB group; Fewer re-operation for bleeding (0.8 vs 3.8%, p<0.001), fewer peak troponin>19mg/dl (4.7% vs 9.9%, p<0,001), and fewer IABP use (1.5% vs 3.3%, p=0,027) in the OPCAB group. Sub-group analysis showed no difference between the two groups with exception of a higher rate of troponin peak >19mg/dl adjusted for CAD extension in the left-main stem disease group undergoing ONCAB (OR=2,3 +-0.8 p=0,018).

## CONCLUSION

The major randomized controlled trials comparing the two strategies show: No difference in 30-days mortality, 1-year survival, AKY and stroke rates; Less re-revascularization rates and higher bypass per patient and bypass patency with ONCAB. Despite the large volume of evidence generated around both on-pump and off-pump CABG strategies, studies fail to demonstrate clear benefit of either strategy regarding mortality and most common complications. Our results are similar of those found in the literature as neither strategy has unequivocal superior results. ONCAB shows consistently higher rates of complete revascularization and higher number of grafts. OPCAB shows lesser troponin levels suggestive of less myocardial damage. Major limitations include: analysis not matched for surgeon performance; cardiac related events, re-revascularization need and graft patency not evaluated; isolated use of troponin levels for evaluation myocardial damage.



# THE FIRST 24 ROBOTIC SURGERIES OF HOSPITAL DA LUZ

João Eurico Reis<sup>1</sup>; João Santos Silva<sup>1</sup>; Ana Rita Costa<sup>1</sup>; Fernando Palma Martelo<sup>1</sup>

<sup>1</sup> Hospital Santa Cruz

## INTRODUCTION

Robotic assisted thoracic surgery (RATS) has been growing all over the world, presenting itself as an improvement over video-assisted thoracic surgery (VATS). The main advantages are the precision of the movements, as well as the three-dimensional vision with the consequent perception of the depth of the surgical field. Thus, technically more difficult procedures, such as anatomic segmentectomies and bronchoplastic resections, are facilitated. This surgical approach also improves the quality of mediastinal lymph node dissection, extremely important in lung cancer patients. Objective: Analysis of the first 24 robotic thoracic surgeries performed at Hospital da Luz.

## METHODS

All robotic thoracic surgeries performed at Hospital da Luz from 2/6/2016 to this date were evaluated, concerning diagnosis, type of surgery, chest drainage time, hospitalization time, morbidity and mortality.

## RESULTS

Twenty-four RATS were performed, with patients having a mean age of 60.5 (39-76) years, eleven of them being male. All surgeries were performed with 3 ports of 8mm and a 12mm port for the assistant. Eighteen surgeries of pulmonary resection (75%), five surgeries for mediastinal lesions (20.8%),

and one for intercostal nerve harvest for reinnervation of the brachial plexus, were performed. In the pulmonary surgeries, eleven were lobectomies (61.1%), five were anatomic segmentectomies (27.8%) and two wedge resections (11.1%). Neoplastic disease was the reason for the sixteen lung anatomic resections, two for metastatic disease and fourteen for primary lung cancer. In each case, a systemic lymph node dissection was performed. All procedures were performed without intra- or postoperative complications. Mean drainage time was 3.4 days [2-6], and mean hospitalization time was 4.8 days [3-8]. There were no mortality or major morbidity. There were two patients with prolonged air-leak up to 6 days. The morbidity after discharge was 12.5%, consisting of an apical pneumothorax that resolved spontaneously, a basal pleural effusion that resolved with outpatient thoracentesis, and a respiratory infection treated with antibiotic.

## CONCLUSION

The overall evaluation of this technique is still precocious, but allows to affirm that an experienced surgeon in vats surgery has a faster learning curve with this new approach. The innovation and development of new techniques in thoracic surgery are fundamental in order to allow more effective treatments, with less pain and, when possible, lung parenchyma sparing surgeries in patients with early neoplastic lung disease.

# ARTERIAL VASCULAR COMPLICATIONS IN PERIPHERAL VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION SUPPORT

Rita Augusto<sup>1</sup>; Marisa Passos Silva<sup>1</sup>; Jacinta Campos<sup>1</sup>; Andreia Coelho<sup>1</sup>; Nuno Coelho<sup>1</sup>;  
Ana Carolina Semião<sup>1</sup>; Evelise Pinto<sup>1</sup>; Daniel Brandão<sup>1</sup>; Alexandra Canedo<sup>1</sup>

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## INTRODUCTION

Extracorporeal membrane oxygenation (ECMO) has been evolved as a life-saving measure for patients requiring emergent support of respiratory and cardiac function. The femoral artery is the standard site for vascular access when initiating adult venoarterial (VA) ECMO. Cannulation-related complications are a known source of morbidity and it has been speculated that patients undergoing ECMO via femoral arterial cannulation are more likely to develop peripheral vascular complications (up to 70%). In patients with severe peripheral arterial disease (PAD) these risks are even higher and its presence may be considered a relative contraindication for femoral artery cannulation.

## METHODS

Retrospective institutional review of patients requiring ECMO (January 2011-August 2017). The primary outcome of this study was to investigate the prevalence of cannulation-related complications on VA ECMO and to determine its effect on patient morbimortality. We evaluated demographics and co-morbidities data. Patients were divided into two groups (complications present VS not present) and statistical analysis was performed to determine the impact of different variables such as co-morbidities, cannulation strategy and time on ECMO in each group. Operative reports were reviewed to analyze the surgical procedures implied for treating vascular complications.

## RESULTS

Eighty-two patients underwent ECMO therapy

during the period of study, 56,1% were male with a mean age of 55,8 years. The median time on the ECMO device was 5,5 days. The VA mode was used in 61 patients, 56 with peripheral cannulation. Femoral arterial access was established in 52 patients (73% percutaneously). Vascular complications were observed in 28,6% of the VA femoral ECMOs: 12 acute limb ischemias and 3 major hemorrhages. At the time of femoral cannulation, distal peripheral catheter (DPC) was placed in 5 patients and none developed subsequent limb ischemia. For those who developed limb ischemia, several interventions were performed: DPC placement in 9 cases, fasciotomy in 4 and 2 major amputations. Thirty patients underwent arterial cannulas open surgical removal: 8 underwent balloon catheter thrombectomy and 5 needed femoral reconstruction. There was an association between PAD ( $p=0,03$ ) and ischemic cardiopathy ( $p=0,02$ ; OR 4,5) with the present of vascular complications after ECMO implantation. VA femoral ECMO mortality was 69,2% ( $n=36$ ). Vascular complications after ECMO support are not associated with higher mortality rates ( $p>0,05$ ).

## CONCLUSION

Cannulation of femoral vessels remains associated with considerable rates of vascular events (28.6%). PAD and ischemic cardiopathy are associated with vascular complications in this form of cannulation. Physical examination and the assessment of ankle-brachial index before ECMO implantation is therefore recommended. Improved efforts at preventing these complications need to be developed to avoid additional morbidity in an already critical patient population.

# SURGICAL TREATMENT OPTIONS OF SUBCLAVIAN ARTERY PSEUDOANEURYSMS: A CASE REPORT AND LITERATURE REVIEW

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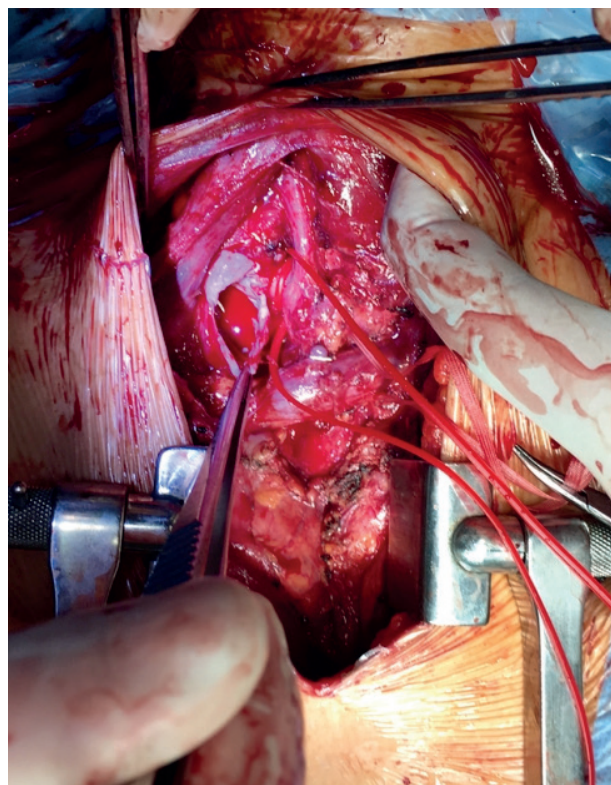
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## INTRODUCTION

Subclavian artery pseudoaneurysms are rare and occur mostly as a consequence of an inadvertent arterial puncture during central venous catheterization, endovascular therapeutic procedures or after penetrating or blunt trauma. They usually have a late clinical presentation, with pain, swelling or other compressive symptoms. The optimal treatment in this situation is still a matter of debate. The authors describe a case of late presentation of subclavian artery pseudoaneurysm after transjugular hepatic biopsy and discuss the several options for treatment.

## METHODS

A 41-year-old woman was admitted in our hospital due to symptomatic subclavian artery pseudoaneurysm. She underwent a biopsy 20 years earlier for an undetermined febrile syndrome. The pseudoaneurysm was diagnosed during investigation of a right non-pulsatile cervical mass that was associated to cervical edema and Horner's syndrome. CTA revealed a pseudoaneurysm of right subclavian artery with 35 mm of diameter and an arteriovenous fistula to jugular vein which presented with significant enlargement. Additionally, the vertebral venous plexus was also ingurgitated. The pseudoaneurysm caused a left shift of the thyroid, common carotid artery and trachea. The vertebral artery arised 4 mm distal to pseudoaneurysm.



## RESULTS

After a multidisciplinary evaluation including vascular surgery, neuroradiology and cardiac surgery, she underwent surgical exclusion of false aneurysm and arteriovenous fistula via partial upper sternotomy with cervicotomy. Care was taken to preserve the vertebral artery. There was a complete resolution of compressive symptoms and there were no complications during the first year of follow up.

## CONCLUSION

Subclavian artery pseudoaneurysms impose a major surgical challenge, especially when originating from the proximal third. Large pseudoaneurysms may rupture or produce signs and symptoms of compression. If intervention is considered necessary, several options are available: open surgical resection and vascular reconstruction, endovascular

exclusion, stentgraft implantation or ultrasound-guided thrombin injection have all been described. The choice of procedure should be tailored to the patient, based on comorbidities, clinical presentation and anatomic characteristics. When compressive symptoms exist, an open approach is advised. However, because of their location, surgical exposure of the pseudoaneurysm may be technically difficult, requiring a sternotomy or a clavicular resection for adequate exposure. An endovascular approach demands an adequate landing zone and absence of severe tortuosity. When arteriovenous fistulae and enlargement of vertebral veins are verified, with subsequent increase in venous pressure, there is a risk of cervical radiculopathy (2-4%). This case report describes an uncommon presentation of subclavian pseudoaneurysm and exemplifies the complexity of their treatment.



# COMPARISON BETWEEN ENDOVASCULAR APPROACH AND AORTO-BIFEMORAL BYPASS FOR TASC D AORTO-ILIAC DISEASE PATIENTS TREATED BETWEEN 2011-2017

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## INTRODUCTION

In the last few years, endovascular approaches have been demonstrating remarkable results on the treatment of aortoiliac TASC D lesions. However, the results remain conflictuous and proper evidence regarding the best treatment option for this group of patients is still lacking. Through this work, we aim to compare patency, cost-effectiveness and quality of life in patients successfully treated by these two approaches.

## METHODS

Patients with TASC D aorto-iliac disease, from two independent Vascular Surgery Centers, treated either by open surgery and endovascular intervention between 2011-2017, were retrospectively analyzed and consecutively included (n=59). Patients were then divided in 2 groups: Open Group (OG), in which aorto-bifemoral bypass was performed (n=27); and Endo Group (EG), in which an endovascular approach was preferred (n=32). Surgical decision between these two procedures was made individually by the surgeon, according to clinical criteria.

Baseline characteristics (age, diabetes, smoking history, chronic kidney disease and rutherford grade of ischemia) were also evaluated. Quality of life (QoL) was later assessed by means of three physical and telephonic validated questionnaires (EQ-5D-5L; peripheral artery questionnaire; walking impairment questionnaire).

## RESULTS

There were significant statistical differences between the OG and EG, regarding mean age (62 vs 65 years,  $p=0,044$ ) and tobacco use (100 vs 75%,  $p=0,05$ ), but both groups were comparable for the remaining baseline characteristics. Technical success was achieved in 100% of the cases of OG, while only in 65% was it obtained in the EG ( $p=0,001$ ). Consequently, re-intervention rate was higher in the later. Regarding infection rate, it was significantly higher in the OG (11.1% vs 0%,  $p=0,05$ ). No differences between groups were found regarding limb salvage (96,3% vs 100%,  $p>0,05$ ). Cost-analysis revealed that endovascular procedures were significantly more expensive than open interventions (1053€ vs 2080€,  $p=0,001$ ), with similar inpatient lengths. Nonetheless, ICU occupation was significantly lower in the EG (3,8 vs 0,05 days,  $p=0,05$ ). No differences between groups were found in the questionnaires of QoL ( $p>0,05$ ).

## CONCLUSION

Despite higher rates of technical success in the OG, patency and limb salvage seems quite similar between the two techniques. Also, endovascular approach of the aortoiliac sector remains significantly less invasive than the conventional alternative. Based on this, and despite the higher success rate of open surgery, shouldn't we give an opportunity to the "endovascular first" approach?

# OUTCOMES AFTER CATHETER DIRECT THROMBOLYSIS FOR ACUTE LIMB ISCHAEMIA – SINGLE CENTER EXPERIENCE

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**Key Words:** acute limb ischaemia, catheter directed thrombolysis, amputation free survival

## INTRODUCTION

The aim of this study is to evaluate the outcome of catheter directed thrombolysis (CDT) in acute lower limb ischaemia depending on the underlying etiology.

## METHODS

Retrospective single center analysis of electronic clinical data on patients with acute lower limb ischaemia treated with CDT. Between January 2011 and September 2017, 128 procedures in 106 patients were included. The etiology of ischaemia was native artery thrombosis in 39 procedures (30,5%), PTFE graft thrombosis in 56 (43,8%), intra-stent thrombosis in 11 (8,6%), emboly in 9 (7%), popliteal aneurysm thrombosis in 9 (7%), vein graft thrombosis in 2 (1,6%) and popliteal artery entrapment in 2 (1,6%).

## RESULTS

Median follow-up time was 14 months [range: 6-31], during which 22% needed further intervention. The need for reintervention was 27,6% in native artery thrombosis group, 65,2% in PTFE graft thrombosis group, 18,2% in intra- stent thrombosis group. No reinterventions occurred neither in popliteal aneurysm group or emboly group. Amputation free survival was 83,3% (SE 4,6%) at 27 months and cumulative incidence of death was 10,1% (SE 5,2%) at 32 months, with no differences between the groups.

## CONCLUSION

Intra-arterial thrombolytic therapy achieves good mid-term clinical outcomes, reducing obviating the need to open surgical treatment in many patients. These results support the choice for CDT as a valid option in acute limb ischaemia of several etiologies.

# ENDOVASCULAR REMOVAL OF FOREIGN BODIES

Roger Rodrigues<sup>1</sup>; Alfredo Agostinho<sup>1</sup>; Gabriel Anacleto<sup>1</sup>; Paula Branco<sup>1</sup>; Óscar Gonçalves<sup>1</sup>

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## INTRODUCTION

Intravascular or catheter embolization of a foreign body, either by fracture or migration, is a rare condition, occurring in approximately 1%. This study is focused on the migration of catheters since they represent the majority of cases of embolization. We present one of the largest published series of removal of foreign bodies with endovascular techniques. The objective of the present study is to demonstrate the different locations where foreign bodies, in most cases catheters, can reach, the technique used to remove them and the affected population.

## METHODS

This is a 9 years retrospective study in which we report the cases of foreign bodies removal performed by an endovascular approach between 2009 and 2017 in our institution.

It includes 53 patients: 28 women and 25 men. The average age was 58 years (ranging from 15 to 87 years). The catheters were implanted by a heterogeneous group of professionals.

## RESULTS

Thirty three totally implantable catheters (Implantofix<sup>®</sup>), sixteen peripheral inserted central catheter, three Guide Wires, one angioplasty balloon and one Amplazer vascular

plug were extracted. The most common sites for the lodging of one of the ends of the intravascular foreign bodies were the right atrium (35,8%) the superior vena cava (11,3%) and the right ventricle (11,3%). In 98,1% of the cases, only one venous access was used for extraction of foreign bodies, and in 96,2% of the cases the right femoral access was used. The loop-snare technique was used in 45 cases (84,9%) and in 8 cases a basket was the option. The most common cause of catheter embolization was the disconnection between the catheter and the port during the surgery for its removal, which occurred in 55,1% of the cases. Fracture of totally implantable catheters occurred in 12,2%. The fracture of a peripheral inserted central catheter represents 32,7% of cases of embolization. Atrial fibrillation, occurred in 8 cases. The mortality rate during the procedure was zero. Technical performance was 100% successful.

## CONCLUSION

Percutaneous intervention for removal of intravascular foreign bodies is currently the best treatment option for patients. It is a minimally invasive, procedure, with low complication rates. Embolised material can be quite safely retrieved, and presents an attractive alternative to surgical removal of these devices. However, this work should serve as a consideration about the safety of the removal of catheters as well as their quality in order to reduce this type of complications.

# INFLUENCE OF INTERHOSPITAL TRANSFER ON OUTCOMES OF SYMPTOMATIC AND RUPTURED ABDOMINAL AORTIC ANEURYSMS

Nelson Camacho<sup>1</sup>; Frederico Bastos Gonçalves<sup>1</sup>; Gonçalo Rodrigues<sup>1</sup>; Anita Quintas<sup>1</sup>; Rodolfo Abreu<sup>1</sup>; Rita Ferreira<sup>1</sup>; Joana Catarino<sup>1</sup>; Ricardo Correira<sup>1</sup>; Rita Bento<sup>1</sup>; Maria Emília Ferreira<sup>1</sup>

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## INTRODUCTION

Symptomatic or ruptured abdominal aortic aneurysms (rAAA) maintains a high mortality index despite technical advances in its treatment. The influence of patients' geographic location on rAAA outcomes, when the rupture occurs or when the AAA becomes symptomatic, has not been a commonly studied issue. Due to the lack of research on this matter, the impact of interhospital transfer on mortality is ambiguous. Objective: Evaluate the influence of the geographic location of patients with symptomatic AAA or rAAA on AAA mortality.

## METHODS

Retrospective review of all cases of symptomatic AAA and rAAA submitted to surgery in a tertiary institution, between January 2011 and August 2017. The main outcome was in-hospital mortality. Secondary outcomes were admission to intensive care unit (ICU), length of ICU and hospital stay, type of repair and anesthesia and weekend presentation. Data was submitted to univariable analysis and logistic regression. Statistical significance was considered if the p value was <0.05.

## RESULTS

During the defined period of 80 months, a total of 135 patients were admitted with the diagnosis of symptomatic or rAAA and submitted to surgery. Most patients had a ruptured AAA (90.4%, n=122), while symptomatic AAA

represented a minority (9.6%, n=13). All patients (91.1% male gender, mean age 74±10 years) were submitted to surgery, 83 (61.5%) by endovascular repair and 52 (38.5%) by open repair, 30.4% with local anesthesia and sedation (n=41), all in the endovascular group. 92 patients (68.1%) were transferred from other hospitals, with a mean distance of 113±88 km. In this cohort, in-hospital mortality was 31.5% in transferred patients and 34.9% in not transferred patients. Subgroup analysis revealed that there were no significant differences between transferred and not transferred patients' groups concerning main outcome (p=0.35), baseline characteristics (age and gender), type of surgery and anesthesia, weekend presentation, ICU admission, length of ICU and hospital stay. Logistic regression analysis revealed that the variables associated with mortality were female gender (odds ratio [OR] 2.28; 95% confidence interval [CI] 1.40-3.70; p<0.01), open repair (OR 2.79; 95% CI 1.68-4.63; p<0.01) and general anesthesia (OR 9.16; 95% CI 2.33-36.06; p<0.01).

## CONCLUSION

Our study revealed that transfer of patients for urgent repair of AAA was not associated with an increased mortality. The hypothetical increased mortality due to transfer might have been compensated by endovascular treatment and local anesthesia in some cases. Further studies must be carried out, particularly comparing endovascular and open repair in emergency setting.

# MEDIAN ARCUATE LIGAMENT SYNDROME – LITERATURE REVIEW AND CASE REPORT

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## INTRODUCTION

Median arcuate ligament syndrome (MALS) or Dunbar syndrome is a rare clinical entity characterized by celiac trunk compression by median arcuate ligament and variable gastrointestinal symptoms (postprandial epigastric pain, nausea, weight loss, anorexia and diarrhea). However, some degree of radiographic compression is observed in 10%-24% of asymptomatic patients. Besides the extrinsic vascular compression, MALS has a multifactorial etiology and it has been suggested as a neurogenic disease resulting in altered sensation and pain from the somatic nerves in the splanchnic plexus. MALS is a diagnosis of exclusion, so other causes must be excluded. Treatment options include release of median arcuate ligament (open, laparoscopic or robot-assisted) and open vascular reconstruction. Endovascular treatment is currently used only as adjuvant procedure after surgical approach, in refractory cases with residual stenosis of celiac trunk. Objective: To report a case of MALS and to review current literature.

## METHODS

The authors report a clinical case and present a literature review using PubMed with the terms “median arcuate ligament”, “Dunbar syndrome” and “MALS treatment” as major topics. The bibliography of relevant articles has been checked to identify other significant papers.

## RESULTS

A 34-year-old woman, previously healthy, recurred

to a General Practitioner with a recurrent epigastric pain, exacerbated by ingestion, without relieving factors, in the previous 6 months. Patient also reported anorexia and unprovoked weight loss of 8Kg over 3 months. Physical examination was normal. Other gastrointestinal pathologies were ruled out. Computed Tomography Angiography (CTA) abdomen revealed a focal 80% stenosis of the celiac trunk, located 8mm from its origin in aorta and a post-stenotic enlargement of 9mm.

An open decompression of the celiac trunk was performed. Through an 8cm median supraumbilical laparotomy, supraceliac abdominal aorta was approached. The compressive band across the celiac trunk was identified and cut. Further dissection was performed until the celiac artery became completely exposed and its branches identified. The postoperative period was uneventful and the patient was discharged 5 days later, with normal gastrointestinal transit and without recurrence of the abdominal pain. 1 month later, the patient remained asymptomatic. A long-term follow-up with annual duplex scan and clinical evaluation must be done, in order to evaluate the need of a revascularization due to persistent stenosis or aneurysmal degeneration.

## CONCLUSION

MALS diagnostic and therapeutic approach must be patient focused, bearing in mind the multiple clinical presentation and treatment options. Open surgical decompression of median arcuate ligament is the base of therapy.

# EMERGENCY NIGHTMARES – RUPTURE OF TYPE III THORACOABDOMINAL ANEURYSM

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## INTRODUCTION

The rupture of thoracoabdominal aneurysms (rTAA) represents one of the major challenges to the vascular surgeon. Recent developments in the endovascular armamentarium and the high mortality from open surgery make endovascular treatment an attractive option. Devices to be used in an emergency environment should be "off-the-shelf" and include, among others, EVAR snorkel/chimney and branched endoprosthesis (T-branch, Cook®).

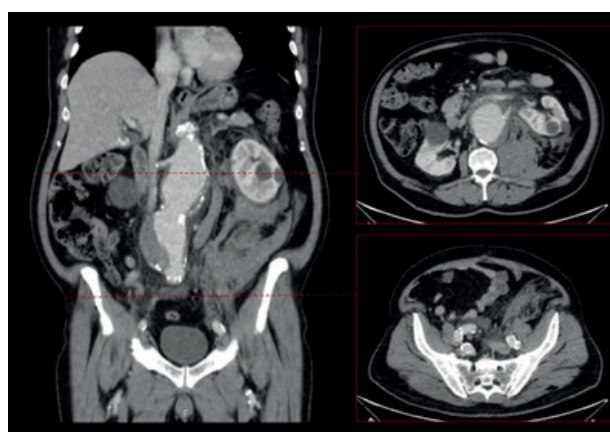
## METHODS

We describe the case of a 70-year-old patient who was admitted to the emergency room due continuous low back pain with 3 days of evolution.

## RESULTS

The tomographic computer angiography showed a type III thoracoabdominal aneurysm, with a transverse maximum diameter of 75x81mm in the infrarenal aorta and an exuberant hematoma in the left retroperitoneum, but no active extravasation of the contrast was observed (Figure 1). There was still marked tortuosity and moderate iliac calcification.

It was decided to place a branched endoprosthesis (34 mm diameter at the top and 18 mm at the bottom). The branched endoprosthesis was extra-corporeally oriented, and introduced through a right femoral approach. The final position was verified with the digital subtraction angiography in anteroposterior incidence, ensuring that the distal border of each branch was 1.5 to 2 cm above the target vessel and that the stent marks presented the desired position. After the endoprosthesis was opened, the branches are catheterized by the left axillary access, however, it was verified that the endoprosthesis had an antero-posteriorly inverted implantation. It was possible to catheterize the superior mesenteric artery and the left renal artery (celiac trunk occlusion was



documented intraoperatively); occlusion of the remaining endoprosthesis branches was performed with an Amplatzer. The patient evolved with multiorgan dysfunction and died at 24 hours post-operatively.

## CONCLUSION

Implantation of an off-the-shelf branched endoprosthesis requires specific anatomical criteria such as aortic diameter > 25mm to allow catheterization of the vessels, the possibility of incorporating each target vessel at a 90° angle in relation to each branch and visceral arteries with a diameter between 4 and 8 mm. Anatomy review is important to understand the lengths and positions of the branches. It should be borne in mind that it is possible that the device might have to be rotated during implantation to better align the marks and that both incidences (anteroposterior and profile) may be useful in confirming the position, something that should be thoroughly pursued to safeguard a correct implantation regardless of the initial stent position in your delivery system.

# ENDOVASCULAR SOLUTIONS FOR THORACIC AORTIC ANEURYSMS WITH CHALLENGING ANATOMIES

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## INTRODUCTION

The suitability of the proximal and distal landing zones remains one of the main limitations to thoracic endovascular aortic repair. The advent of custom-made scalloped stent grafts widened the endovascular options in some challenging anatomies.

## METHODS

The authors present three cases of thoracic aortic aneurysm (TAA), with three different hostile anatomies, successfully treated with custom-made scalloped stent grafts.

## RESULTS

**Case1:** Male patient, 47 years old, no relevant medical history. Angio-CT revealed a 54mm post-traumatic TAA, extending distally from the origin of the left subclavian artery. Inadequate sealing in Ishimaru zone 2 was evident. The patient was sequentially treated by means of a carotid-subclavian bypass followed by TEVAR with proximal scallop to the left common carotid artery. Proper proximal sealing was obtained. **Case2:** Male patient, 76 years old, diagnosed with a 65mm diameter TAA, involving the origin

of the left subclavian artery. Presence of a bovine trunk, and inadequate landing zone distally to it, were noted. The patient was sequentially treated by means of a carotid-subclavian bypass followed by TEVAR with proximal scallop to the bovine trunk. Proper sealing in Ishimaru zone 2 was granted. **Case3:** Male patient, 77 years old, multiple comorbidities. Angio-CT revealed a 59,3mm saccular aneurysm of the distal thoracic descending aorta, extending proximally from the origin of the celiac trunk. Good collateralization was observed after celiac trunk occlusion test. Proper distal seal was obtained by means of selective embolization of the celiac trunk followed by TEVAR with distal scallop to the superior mesenteric artery. All procedures were uneventful, with no reported endoleaks, birdbeaks, migrations or re-interventions. There are no reported complications at 1-year follow-up.

## CONCLUSION

Custom-made scalloped thoracic stentgrafts are an accessible, reproducible and safe therapeutic option when dealing with hostile descending thoracic anatomies, and should be considered as a minimally-invasive effective solution in selected cases.



# GIANT RUPTURED COMMON ILIAC ARTERY INFECTED ANEURYSM

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## INTRODUCTION

Saccular mycotic aorto-iliac aneurysms are extremely rare and when presented with ruptured, they are an important life-threatening condition.

## METHODS

We present a 52 years old male transferred from another Hospital and admitted to the emergency room with a ruptured iliac artery aneurysm.

## RESULTS

He complained of persistent fever and abdominal discomfort that swiftly established as hemorrhagic shock. Imagiological study with angioCT revealed a ruptured left common iliac artery saccular aneurysm with 90mm. The patient was instantaneously and successfully submitted to endoaneurismorrhaphy, common and external iliac artery

ligation and construction of an extra anatomic bypass, right to left femoro-femoral bypass. Blood culture revealed a *Streptococcus anginosus* and the patient received appropriate targeted antibiotics. Post-operative period was uneventful and the patient discharged ten days after admission. He has now eleven months of follow up with no intercurrents.

## CONCLUSION

Long term antibiotics along with aggressive surgical debridement of the infected tissue and vascular revascularization with an extra anatomic bypass remain the most definitive solution while endovascular aneurysm repair may generally constitute a bridge life-saving procedure in mycotic infected aneurysms. Even though surgical approach carries a relative risk of perioperative morbidity it is a feasible and durable solution for extreme situations like the one here described.

# IN THE CURRENT ERA OF ENDOVASCULAR SURGERY, WHAT IS THE ROLE OF AXILLOFEMORAL BYPASS?

Ricardo Correia<sup>1</sup>; Rita Ferreira<sup>1</sup>; Ana Garcia<sup>1</sup>; Frederico Gonçalves<sup>1</sup>; Rodolfo Abreu<sup>1</sup>; Nelson Camacho<sup>1</sup>; Joana Catarino<sup>1</sup>; Maria Emília Ferreira<sup>1</sup>

<sup>1</sup> Hospital de Santa Marta

## INTRODUCTION

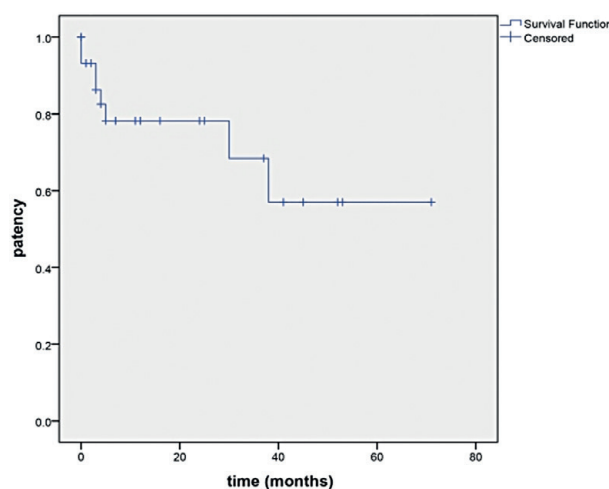
Nowadays, axillofemoral bypass is viewed as an end-of-line solution for lower limb revascularization, owing to its classically described poor long-term patency, and recent advances in endovascular options for patients with complex aortoiliac anatomy not suitable for open reconstruction. There is a marked difference in patient profiles in published series of axillofemoral bypass, reflecting changing procedures indications due to technical innovations. The objective of this study is to determine the contemporary profile of patients treated with axillofemoral bypass and their outcome.

## METHODS

Patients who underwent axillofemoral bypass surgery in a tertiary hospital from April 2011 to September 2017 were identified. Surgical indication, patency, amputation and death rates were recorded. Patients were grouped in axillouni vs axillobifemoral, 1st revascularization procedure vs reintervention, and primary aortoiliac occlusive disease vs primary aneurysmal disease, and were compared using Kaplan-Meier survival analysis.

## RESULTS

54 patients were included. 80% underwent an axillobifemoral bypass. Median age was 67 years; 96% were male. The most prevalent cardiovascular risk factors were HTA (81%) and history of smoking (76%). Primary vascular disease was aneurysmal in 24% of patients. The remaining group had peripheral occlusive arterial disease. In 53%, axillofemoral bypass was the first revascularization performed (naïf group). On these, indications for this procedure were aorto-iliac occlusive disease (89%) and AA thrombosis (19%). In patients previously submitted to



**Graphic 1**

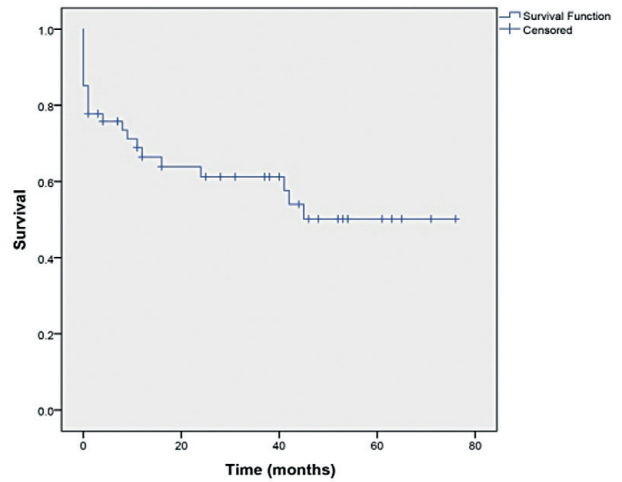
Survival curve for axillofemoral bypass primary patency.

revascularization (47%), the most common first procedures were aortobifemoral bypass (56%), femoro-femoral bypass (44%) and EVAR (36%). Indications for axillofemoral bypass on this group were: prosthesis thrombosis (64%), secondary aorto-enteric fistulae (28%) and prosthesis infection (8%). Primary patency of axillofemoral bypass was 93% at 1 month and 80% at 5 years (Graphic 1). Differences were not significant regardless the vascular surgery status (naïf vs reintervention), but axillobifemoral bypass and aneurysmal disease groups had a higher patency than axillounifemoral bypass and occlusive disease groups, respectively. No patient with aneurysmal disease required amputation over a 5-year follow-up. In primary occlusive disease group, 88% of patients were free-of-amputation at 1 month and

83% at 5 years. Patients who underwent this procedure had a survival rate of 78% at 1 month and 59% at 5 years (Graphic 2). No major difference was recorded between study groups.

**CONCLUSION**

Axillofemoral bypass, although being an increasingly uncommon procedure, still allows acceptable rates of patency and limb salvage. As patients with aortoiliac disease usually have multiple comorbidities and a short life-expectancy, axillofemoral bypass is attractive owing to its less invasive character.



**Graphic 2** *Survival curve for postoperative survival.*

# PULMONARY HYPERTENSION IN VALVULAR HEART DISEASE SURGERY: RISK AND PROGNOSIS

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## INTRODUCTION

Left heart disease is the most common cause of pulmonary hypertension (PH), and when present is associated with higher surgical risk. Objectives: Analyze the effect of PH severity on morbidity, early and late mortality in patients with pulmonary artery systolic pressure (PASP) over 30mmHg that underwent valvular heart surgery.

## METHODS

Retrospective observational study including all patients with PH, defined as PASP>30 mmHg that underwent isolated valvular heart surgery, between 2007 and 2016. Exclusion criteria were: active endocarditis, congenital heart disease, transcatheter aortic valve implantation, reoperations and emergent surgery. The study population included 607 patients with a mean age of 69.6 years and a mean PASP of 52.5 mmHg. Mean follow-up for all-cause mortality was 4.4(0-11) years in 99.7% of patients. MACCE (Major Adverse Cardiac and Cerebrovascular event) was defined as at least one of the following: in-hospital mortality, stroke, post-operative myocardial infarction, severe arrhythmia or multiple organ failure. PASP was evaluated as a continuous variable. Simple and multivariable logistic regression was performed to evaluate the in-hospital mortality and MACCE. Cox regression was used for long term follow-up and one-sample log-rank test for comparison with age adjusted general population.

## RESULTS

The in-hospital mortality was 3.2% and PASP was an independent predictor on univariable analysis (OR:1.06; 95%CI:1.03- 1.09;  $p<0.001$ ). On multivariable logistic regression PH remains an independent predictor of in-hospital mortality (OR:1.08; 95%CI:1.04-1.12;  $p<0.001$ ) in addition to age (OR:1.08; 95%CI:1.01-1.17;  $p=0.044$ ).

MACCE was observed in 11.4% and PASP was an independent predictor on univariable analysis (OR:1.03; 95%CI:1.01- 1.04;  $p<0.001$ ). On multivariable logistic regression PASP remains an independent predictor of MACCE (OR:1.02; 95%CI:1.01-1.04;  $p=0.011$ ) as well as hemodialysis (OR:7.16; 95%CI:1.73-29.63;  $p=0.007$ ). The independent predictors of long term mortality were male gender ( $p=0.011$ ), older age ( $p<0.001$ ), higher body mass index ( $p=0.013$ ), urgent surgery ( $p=0.027$ ), pulmonary disease ( $p=0.042$ ) and more than one valve procedure ( $p=0.004$  for 2 valves and  $p=0.006$  for 3 valves). PASP was not an independent predictor of long term mortality ( $p=0.142$ ). Compared with an age adjusted general population, patients with PH had a significantly lower survival rate( $p<0.001$ ), more evident 4 years after the procedure.

## CONCLUSIONS

Higher PASP is a risk factor for in-hospital mortality and MACCE, but there was no significant impact on long term mortality.

# RAPID DEPLOYMENT AORTIC VALVES IN ELDERLY PATIENTS: AGE IS NOT JUST A NUMBER

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## INTRODUCTION

Aortic valve stenosis (AS) is the most common valvular pathology in the elderly. Surgical aortic valve replacement (AVR) remains the gold-standard of treatment for AS. However, emerging transcatheter aortic valve replacement (TAVR) has become an increasing alternative to surgery. In a recent survey from the European Society of Cardiology, 9,4% of the physicians stated that age was the main reason to propose for a TAVR instead of surgery.

## METHODS

We performed a single-center retrospective study including 353 patients (149 patients over 80 years-old, compared to 204 patients between 60-69 years-old) consecutively submitted to AVR between January 1, 2013, and December 31, 2016, to compare the results of both groups in AVR surgery and how we can improve surgery outcome in older patients.

## RESULTS

The demographic and clinical characteristics between the two groups were similar. There were no significant differences in survival between the two groups at 30 days (96,57% 60-69yo vs. 96,64% >80yo), 12 months (89,57% 60-69yo vs. 93,51% >80yo) and 24 months (85,92% 60-69yo vs. 87,62% >80yo). The postoperative complication rates were similar in the two groups, excluding

the rate of post-operative atrial fibrillation, higher in the >80 years-old group (29,06% vs. 17,28%,  $p=0,0147$ ). ICU and average hospital length of stay was similar between the two groups ( $p>0,05$ ). In all patients, Euroscore II was directly correlated to intensive care unit length of stay ( $p=0,0044$ ). In all patients, extracorporeal circulation and aortic cross-clamp times were directly correlated to invasive ventilation time ( $p=0,0254$  and  $p=0,0101$ ) and to post-operative bleeding ( $p=0,0002$  and  $p=0,0015$ ). However, in the subgroup analysis, aortic cross-clamp time was directly correlated to ventilation time ( $p=0,0397$ ) and to intensive care unit length of stay ( $p=0,0493$ ) in the >80yo patients, but that was not verified in the 60-69yo patients ( $p=0,0942$ ,  $p=0,3801$ , respectively).

## CONCLUSION

Survival rates are similar between the two groups, with similar post-operative complications. Post-operative atrial fibrillation and the use of blood and blood products are more common in patients over 80 years-old. In older patients, lower periods of extracorporeal circulation and aortic cross-clamp much be achieved to reduce invasive ventilation time, post-operative bleeding and ICU and hospital length of stay, improving post-operative recovery. It has been shown that rapid deployment aortic valves reduce extracorporeal circulation and aortic cross-clamp times, so their use in elderly patients must improve surgery recovery and outcome.

# HEART TRANSPLANTATION: EARLY RESULTS OF TWO DIFFERENT REGIMES OF IMMUNOSUPPRESSION

Carlos Branco<sup>1</sup> ; David Prieto<sup>1</sup> ; André Antunes<sup>1</sup> ; Manuel Batista<sup>1</sup> ; Manuel J Antunes<sup>1</sup>

<sup>1</sup> CCT-CHUC

## INTRODUCTION

The management of induction and maintenance immunosuppression therapy after heart transplantation (HT) remains a controversial issue. The dosage and the timing has been a changing target. We aimed at evaluate the incidence of acute cellular rejection (ACR) [ $\geq 1R$  grade], major infection and survival in first year after HT in patients receiving two different induction immunosuppression regimes and with a reduction in intensity of triple maintenance immunosuppression dose.

## METHODS

From November-2003 to June-2016, 317 patients were submitted to HT. After excluding those with pediatric age ( $n=8$ ), those with previous renal or hepatic transplantation ( $n=2$ ), those submitted to retransplantation ( $n=2$ ), patients with early death without endomyocardial biopsy ( $n=10$ ) and those in a transition maintenance regime ( $n=26$ ), the study population resulted in 269 patients. These patients were divided in two groups: patients receiving the previous regime of two doses of basiliximab (group A,  $n=211$ ) and those receiving a single dose of basiliximab (group B,  $n=58$ ). All the patients were treated with a maintenance standard triple immunosuppressive regimen of corticosteroids, an inhibitor of calcineurin and mycophenolate mofetil but more immunosuppressive load in group A.

## RESULTS

Mean age of the recipients (group A vs. group B) was  $54.6 \pm 10.6$  vs.  $55.0 \pm 9.8$  years ( $p=0.808$ );  $77.3\%$  vs.  $75.9\%$  were male ( $p=0.861$ );  $28.4\%$  vs.  $28.1\%$  were diabetic ( $p=0.957$ ); and ischemic etiology was present in  $39.8\%$  vs.  $41.0\%$  of the patients ( $p=0.798$ ), respectively. No differences were found, at first year, between the two groups concerning global ACR incidence ( $55.0\%$  vs.  $56.9\%$ ,  $p=0.882$ , respectively) but major ACR ( $\geq 2R$  grade) was slightly superior in group B ( $16.6\%$  vs.  $27.6\%$ ,  $p=0.080$ , respectively). Time-free from major ACR at 3rd, 6th and 12th months was, respectively  $91.0 \pm 2.0\%$  vs.  $84.5 \pm 4.8\%$ ;  $86.7 \pm 2.3\%$  vs.  $74.1 \pm 5.7\%$ ; and  $83.4 \pm 2.6\%$  vs.  $72.4 \pm 5.9\%$  ( $p=0.048$ ). Time-free from major infection at 3rd, 6th and 12th months was, respectively  $89.6 \pm 2.1\%$  vs.  $82.8 \pm 5.0\%$ ;  $87.7 \pm 2.3\%$  vs.  $79.3 \pm 5.3\%$ ; and  $84.4 \pm 2.5\%$  vs.  $79.3 \pm 5.3\%$  ( $p=0.253$ ). No differences were found concerning survival at 3rd, 6th and 12th months ( $94.3 \pm 1.6\%$  vs.  $94.8 \pm 2.9\%$ ;  $92.4 \pm 1.8\%$  vs.  $93.1 \pm 3.3\%$ ; and  $90.0 \pm 2.1\%$  vs.  $91.4 \pm 3.7\%$ , ( $p=0.771$ ) respectively).

## CONCLUSION

With this study, we verified that lowering doses of induction and maintenance therapy was responsible for increase cases of major ACR at first year of heart transplant. However, no differences were found concerning the incidence of major infection and early survival. Hence, effective immunosuppression induction regimen can apparently be done safely with a single dose regime without compromising survival at first year after HT.

# TWO YEARS OF EXPERIENCE IN THE IMPLANTATION OF HEARTMATE III

Vítor Mendes<sup>1</sup>; Candido Cerca<sup>1</sup>; Monique Crosset<sup>1</sup>; Matthias Kirsch<sup>1</sup><sup>1</sup> Centre Hospitalier Universitaire Vaudois- Lausanne

## INTRODUCTION

Left ventricular assist devices as long-term mechanical circulatory support are increasingly used as an option for medically refractory advanced heart failure. Heartmate III is one of the alternative devices for circulatory support in those patients. Objectives: Analyze a two years Heartmate III implantation Program.

## METHODS

From November 2015 to August 2017, Heartmate III was implanted in 16 patients with chronic end-stage heart failure, in 81% (n = 13) as a bridge to transplant and 19% (n = 3) as destination therapy. We did a review off demographic, clinical and surgical data, and we analyzed the overall survival using the Kaplan-Meier method, excluding patients who were transplanted.

## RESULTS

Heartmate III was implanted in 16 male patients (100%) with age  $55.8 \pm 11.1$  years (limits 38-74 years) and body surface area  $2.0 \pm 0.19$  m<sup>2</sup>. The baseline hemodynamic data revealed a cardiac index  $2.1 \pm 0.4$  l / min / m<sup>2</sup> and a left ventricular ejection fraction of  $20.7 \pm 7.3\%$ . Ischemic cardiomyopathy was the most common etiology in this chronic heart failure population (n = 9; 56%). Seven patients (44%)

were classified INTERMACS 4; five (31%) in profile 2; three (19%) in profile 3 and one (6%) in profile 1. The implantation of the devices was performed under Cardiopulmonary Bypass ( $78.6 \pm 25.7$  min), and 25% of the patients (n = 4) had right ventricular dysfunction, requiring postoperative temporary right ventricle support. As complications, 6 patients (38%) manifested bleeding requiring surgery and 2 (12%) reported gastrointestinal bleeding, 4 (25%) developed driveline infection, 3 of them were treated (18%) with conservative therapy and in 1 patient (6%) with driveline transposition. During the total follow-up time (19 months), three patients (18%) were transplanted; two deaths occurred due to pulmonary embolism and ischemic stroke respectively; verified by the Kaplan Meier method, an overall survival rate of  $92.9 \pm 6.9\%$ , stable from 6 months after implantation.

## CONCLUSION

The 6 months survival rate of 92.9% proves the efficacy of this therapy for our patients and all of them were INTERMACS profiles lower than 4. Despite the small number of patients enrolled and the follow-up duration limiting our study, we demonstrated the first experience of our center in the treatment of high-risk population. In conclusion, we show that the Heartmate III was consistent in low INTERMACS profile patients.

# FREEDOM SOLO VERSUS TRIFECTA BIOPROSTHESES: CLINICAL AND HEMODYNAMIC EVALUATION AFTER PROPENSITY SCORE MATCHING

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## INTRODUCTION

To compare stentless Freedom Solo and stented Trifecta aortic bioprostheses regarding hemodynamic profile, left ventricular mass regression, early and late postoperative outcomes and survival.

## METHODS

Longitudinal cohort study of consecutive patients undergoing aortic valve replacement (from 2009 to 2016) with either Freedom Solo or Trifecta at one centre. Local databases and national records were queried. Postoperative echocardiography (3-6 months) was obtained for hemodynamic profile (mean transprosthetic gradient and effective orifice area) and left ventricle mass determination. After propensity score matching (21 covariates), Kaplan-Meier analysis and cumulative incidence analysis were performed for survival and combined outcome of structural valve deterioration and endocarditis, respectively. Hemodynamics and left ventricle mass regression were assessed by a mixed-effects model including propensity score as a covariate.

## RESULTS

From a total sample of 397 Freedom Solo and 525 Trifecta patients with a median follow-up time of 4.0 (2.2-6.0) and 2.4 (1.4-3.7) years, respectively, a matched sample of 329 pairs was obtained. Well-balanced matched groups showed no difference in survival (hazard ratio=1.04, 95% confidence interval=0.69-1.56) or cumulative hazards of combined outcome (subhazard ratio=0.54, 95% confidence interval=0.21-1.39). Although Trifecta showed improved hemodynamic profile compared to Freedom Solo, no differences were found in left ventricle mass regression.

## CONCLUSION

Trifecta has a slightly improved hemodynamic profile compared to Freedom Solo but this does not translate into differences in the extent of mass regression, postoperative outcomes or survival, which were good and comparable for both bioprostheses. Long-term follow-up is needed for comparisons with older models of bioprostheses.



# ISOLATED TRICUSPID VALVE SURGERY: REPAIR VERSUS REPLACEMENT

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## INTRODUCTION

Isolated tricuspid valve surgery (ITVS) is an uncommon procedure with few studies published. We report our series of ITVS and compare surgical outcomes and mortality in patients undergoing valve repair (TVR) versus replacement (TVRep).

## METHODS

Retrospective study including all patients who underwent ITVS (n = 34) between July 2008 and June 2017, divided in two groups according to type of procedure: TVR 20 patients and TVRep 14 patients. We reviewed preoperative characteristics and analysed operative data, outcomes and mortality in both groups.

## RESULTS

Thirty-four patients underwent ITVS, mean age  $58,1 \pm 15,9$  years, 50% female and mean BMI  $26,1 \text{ kg/m}^2$ . TVR was performed in 58,8% and TVRep in 41,2% of patients. Patients had similar demographic and baseline characteristics, except for previous cardiac surgery (TVRep 78,6% vs. TVR 35,%,  $p < 0,05$ ). Mean logistic EuroSCORE was 10,1% for TVRep and 6,6% for TVR ( $p < 0,05$ ). Etiologies were functional insufficiency (68%), endocarditis (18%), degenerative (9%), rheumatic (3%) and congenital (3%). TVR was the preferred surgical approach. Ring

annuloplasty was performed for all TVR and bioprosthesis was used for all TVRep. Postoperative complications were: need for transfusional support (76,5%), inotropic support longer than 48 hours (38,2%), prolonged invasive ventilation over 24 hours (35,3%), new onset of atrial fibrillation (11,8%), duplication or postoperative creatinine over 2 mg/dl (8,8%), dialysis (8,8%), stroke (5,9%), intra-aortic balloon pump (5,9%), permanent pacemaker implantation (2,9%) and sepsis (2,9%). TVRep was associated with superior length of surgery (TVRep 291 vs. TVR 186 minutes), longer ICU stay (TVRep 17,1 vs. TVR 2,8 days), longer hospital stay (TVRep 37,1 vs. TVR 11,7 days), prolonged invasive ventilation (TVRep 71,4% vs. TVR 10%) and longer inotropic support (TVRep 78,6% vs. TVR 10%) ( $p < 0,05$ ). Overall 30-day and 1-year mortality were 8,8% and 17,6%, respectively. Type of procedure was not associated to 30-day mortality (TVRep 14,3% vs. TVR 5%,  $p < 0,05$ ), but TVRep was associated with higher 1-year mortality (TVRep 35,7% vs. TVR 5%,  $p < 0,05$ ).

## CONCLUSIONS

TVR showed better outcomes, with less postoperative complications and mortality than TVRep. This difference cannot be linked to type of pathology, although patients in the latter group may be associated to greater complexity, with higher risk and were often reoperations.

# AORTIC VALVE REPLACEMENT WITH PERCEVAL® BIOPROSTHESIS: INITIAL SINGLE-CENTER EXPERIENCE

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## INTRODUCTION

Aortic valve replacement (AVR) is the gold standard for the treatment of severe or symptomatic aortic valve stenosis. Less invasive procedures have been developed as an alternative to the conventional technique of full sternotomy approach with stented prosthesis. The Perceval® aortic valve (LivaNova, Milan, Italy) is a sutureless bioprosthesis, of which several reports have shown promising results in terms of mortality, morbidity and hemodynamic performance, especially with a less invasive approach.

## METHODS

Between March 2016 and September 2017, 43 patients underwent AVR with Perceval® bioprosthesis. The mean age was  $74.3 \pm 6.8$  years, 24 (55.8%) patients were female, and the mean EuroSCORE II was  $4.1 \pm 0.6$ . Concomitant procedures were CABG (n=11; 25.6%), mitral valve surgery (n=2; 4.7%) and tricuspid valve surgery (n=1; 2.4%).

## RESULTS

Isolated AVR were performed in 31 patients (72%), with a less invasive approach in 29 cases (67%), of which 20 patients with upper ministernotomy and 9 patients with

right anterior mini-thoracotomy. Cardiopulmonary bypass and cross-clamp times were  $69.8 \pm 26.6$  and  $49.2 \pm 18.1$  minutes for isolated AVR and  $106.1 \pm 32.6$  and  $82.9 \pm 24.9$  minutes for combined procedures, respectively. Preoperative peak and mean gradients were  $81.6 \pm 24.8$  and  $49.7 \pm 16.1$  mmHg, decreasing to  $22.4 \pm 10.2$  and  $11.9 \pm 5.8$  mmHg, respectively, during follow up (mean  $9.1 \pm 6.0$  months). The mean effective orifice area improved from  $0.77 \pm 0.18$  to  $1.83 \pm 0.45$  cm<sup>2</sup>, and mean left ventricular ejection fraction from  $55.0 \pm 10.0$  to  $55.2 \pm 8.4\%$ ; mean left ventricular mass decreased from  $221.6 \pm 55.7$  to  $180.2 \pm 42.4$  g/m<sup>2</sup>. Trivial paravalvular leakage occurred in 2 patients, without clinical relevance. Five patients (11.6%) needed pacemaker implantation because complete heart-block before discharge (in 4 patients postdilatation modelling wasn't performed). In-hospital mortality was 9.3% (n=4), all non-valve related (mean EuroSCORE II of  $9.15 \pm 4.0$ ).

## CONCLUSION

AVR with the Perceval bioprosthesis is associated with low mortality rates and excellent hemodynamic performance. Sutureless technology may reduce operative times, especially in combined procedures, making minimally invasive AVR more easily reproducible.

# ARTERIAL SWITCH: HOW TO PREDICT REOPERATION

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## INTRODUCTION

Jatene surgery or arterial switch is performed at our institution since 1989. It is mandatory to submit our results to an evaluation that allow us to identify the main causes of reoperation and, more importantly, to determine what variables predict the need of reoperation.

## METHODS

In this retrospective analysis were included all the 91 patients with d-TGA who underwent an arterial switch operation at Santa Marta Hospital between 1999 and 2016.

## RESULTS

Mean follow-up was 6 years (range 1-21 years). 71% of the patients had simple TGA and 29% had complex TGA. The need of reoperation was 21%(n=19).

Pulmonary artery stenosis was the main (47%) indication for reoperation. The overall cumulative mortality was 9.9%. The gender ( $P= 0.8$ ), diagnosis (simple or complex TGA) ( $P= 0,5$ ) or the existence of previous surgeries( $P=0.9$ ) were unable to predict the need of reoperation. The presence of coronary patterns anomalies was the only variable reaching statistical significance ( $P< 0.05$ ), both in univariate and multivariate analysis.

## CONCLUSION

In our series, the main indication for reoperation after arterial switch operation was pulmonary artery stenosis and the only predictive variable was the presence of coronary anomalies.

# FROZEN ELEPHANT TRUNK WITH E-VITA OPEN HYBRID PROSTHESIS FOR SURGICAL CORRECTION OF MULTISEGMENTAL THORACIC AORTIC PATHOLOGY: REVIEW OF RESULTS

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## INTRODUCTION

The Frozen Elephant Trunk (FET) surgery allows correction of ascending, arch and proximal descending aortic pathology, using a hybrid prosthesis at the same time. It is a complex intervention and requires a multidisciplinary team that, besides scheduling and performing the surgery, accompanies the patient (pt) throughout the postoperative period. Objectives: To review short and medium term clinical results with this technique.

## METHODS

Between January 2010 and September 2017, we operated 34 patients (pts) using FET. The surgery was performed under cardiopulmonary bypass (CPB) with cardio-circulatory arrest in deep hypothermia, always with bilateral antegrade selective cerebral protection and under noninvasive neuromonitorization. Antegrade and retrograde, hematic, cold, intermittent cardioplegia was used. All patients were followed in our outpatient clinic with imaging techniques.

## RESULTS

The mean age of the pts was  $62.8 \pm 11.5$  years, 16 males. The mean follow-up period was  $18.7 \pm 16.1$  months. Diagnoses were: chronic type A dissection 9 pts, ascending aortic aneurysm and distal arch 9 pts, pseudoaneurysm 1 pt, mega-aorta syndrome 11 pts. No pt was operated in acute situation. Seven pts (20.6%) were reoperations and in 4 pts

(11.8%) associated cardiac procedures were required. The left subclavian was conserved in 24 pts (70.6%).

CPB, aortic clamping and distal ischemia mean times were, respectively; 260, 149 and 54 minutes. Hospital mortality occurred in five pts (14.7%), 3 of which at the beginning of the series, due to mesenteric ischemia. The hospital morbidity consisted of: ventilator-associated pneumonia 3 pts (8.8%), stroke 2 pts (5.9%), perioperative infarction 1 pt (2.9%) and paraplegia 1 pt (2.9%). Seven pts (20.6%) required 9 endovascular re-interventions (TEVAR) in the distal descending aorta and in two of these an abdominal fenestrated endoprosthesis was implanted by the vascular team. Three pts presented early type IIB endoleaks, which resolved spontaneously in follow-up CT. Among the others there were no endoleaks and the expected involution of the aneurysmal sac and positive remodeling of the aorta was observed. All survivors are clinically stable, asymptomatic, in class NYHA I.

## CONCLUSION

The overall results are in line with the literature. Mesenteric ischaemia is the leading cause of in-hospital death. FET is a safe and effective intervention. The expandable segment of the hybrid prosthesis is an excellent landing zone to complete the procedure, when necessary, with the second stage TEVAR. Survivors acquire an excellent quality of life in the medium term. Clinical follow-up and lifelong imaging techniques are mandatory.

# CAROTID STENOSIS IN CARDIAC SURGERY PATIENTS

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## INTRODUCTION

Ischemic stroke is a potential perioperative complication after an open heart surgery (OHS). Whether a carotid stenosis or occlusion is associated with an increased risk of perioperative stroke in patients or just a risk factor has been a concern of intense debate in the literature.

## METHODS

We retrospectively analyzed patients submitted to OHS between January and December 2016 with known asymptomatic carotid disease.

The data from 85 consecutive patients undergoing coronary artery bypass grafting, valve replacement, or both was collected. The final events registered were stroke, acute myocardial infarct or death. Our aim was to assess whether the presence of carotid stenosis precluded a higher rate of stroke after cardiac surgery.

## RESULTS

70 male and 15 female patients, with a medium age of 74 (min 45, max 84) years were analyzed. 45 (53%) patients were submitted to bypass grafting, 21 (25%) to valve replacement and 19 (22%) to both. Of these patients, 42 (49%) had unilateral significant carotid stenosis equal or greater than 50%, 12 (14%) had bilateral significant stenosis and 20 (24%) had a stenosis equal or greater than 70%. 2 (2%) patients had a previous history of neurologic event. In the peri-operative period, 3 patients (3,5%)

developed transient ischemic attack (TIA) or stroke, 3 (3,5%) a cardiac event and 6 (7%) patients died (3 due to a cardiac event and 2 due to a neurologic event). Two (67%) of the neurologic events occurred in the corresponding side of an hemodynamic carotid stenosis although both these patients had also significant aortic arch calcification and atrial fibrillation. None of the patients that developed post-operative TIA or stroke had previously a neurologic event.

## CONCLUSION

Some studies reported an average stroke incidence around 1.9% following OHS. Despite carotid stenosis, other risk factors should be taken into consideration before considering OHS such as advanced age, prior stroke/TIA, unstable angina, predicted prolonged time for cardiopulmonary bypass, severe aortic arch disease and atrial fibrillation. In our studied population two of the post-operative neurologic events occurred in patients with significant bilateral stenosis, one side between 50-69% and the other side 70-99%. According to the new guidelines "Management of Atherosclerotic Carotid and Vertebral Artery Disease: 2017 Clinical Practice Guidelines of the European Society for Vascular Surgery" staged or synchronous carotid intervention may be considered for OHS patients with bilateral asymptomatic 70-99% carotid stenosis, or a 70-99% stenosis with contralateral occlusion. Our results may suggest that a sub-group of patients with bilateral significant (>50%) carotid stenosis may benefit from staged or synchronous carotid intervention.

# CARDIAC CATHETERIZATION AFTER CABG WITH BIMA GRAFTING: INDEPENDENT PREDICTORS AND MID-TERM BYPASS VIABILITY

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## INTRODUCTION

Coronary artery bypass graft (CABG) patency is an important variable, but rarely studied as the main outcome. The best use of bilateral internal mammary artery (BIMA) grafting regarding configuration type or combination with saphenous vein graft (SVG) is still debated.

Purpose: To find independent predictors for need of cardiac catheterization and for significant lesions in CABG follow-up.

## METHODS

Retrospective cohort including all patients who underwent isolated CABG with BIMA grafts between 2004 and 2013 in a tertiary center. Preoperative, surgical and postoperative data were collected through clinical files and informatics databases. Kaplan-Meier curves, Cox regression and logistic regression were used to find predictors for the need of catheterization and for significant angiographic lesions after CABG. Secondary end-points studied were mid-term survival and need of re-vascularization either surgically or percutaneously.

## RESULTS

We included 1030 patients in this analysis. Median

follow-up time was 5.5 years and 150 (15%) patients were re-catheterized in that period. Most of these procedures was due to ischemia suspicion (74%) and 61 (41%) were positive for significant angiographic lesions of conduits (IMA: 3.2% and SVG: 3.8%,  $p=0.488$ ). In multivariate analysis, SVG use was found as an independent predictor of cardiac catheterization on follow-up (HR: 1.610, CI 95%: 1.038-2.499,  $p=0.034$ ). On the other side, independent predictors of graft lesions were younger age (OR: 0.951, CI 95%: 0.921-0.982,  $p=0.002$ ), female gender (OR: 2.231, CI 95%: 1.038-4.794,  $p=0.040$ ), arterial hypertension (OR: 1.968, CI 95%: 1.022-3.791,  $p=0.043$ ) and 3-vessel disease (OR: 2.820, CI 95%: 1.155-6.885,  $p=0.023$ ). Among the patients with significant angiographic lesions, 48 underwent repeat revascularization (44 PCI e 4 CABG). Arterial hypertension and younger age were independent predictors of re-vascularization.

## CONCLUSION

In BIMA patients the addition of SVG predicts the need of catheterization; however prevalence of significant angiographic lesions was similar in IMA and SVG. Our results suggest that arterial hypertension is an independent predictor of graft patency and re-vascularization rate.

# TEVAR – A PRIMARY OR ADJUNCT PROCEDURE HELPFUL IN THE SURGICAL CORRECTION OF COMPLEX PATHOLOGY OF THE THORACIC AORTA

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## INTRODUCTION

Thoracic Endovascular Aortic Repair (TEVAR) made possible the treatment of aortic disease that previously could only be approached openly, associated with a considerable morbidity and mortality. However, it also brings new challenges influencing patient selection - favourable landing zone, good peripheral access, propensity for endoleak (EL) - that requires rigorous clinical and imaging follow-up. Objective: Review all patients that underwent TEVAR in our Department and assess morbidity and mortality.

## METHODS

From November 2007 to September 2017, 57 TEVAR were performed in our Department to 52 patients. All patients performed postoperative CT angiography within 30 days after surgery. Follow-up was carried in our Outpatient Clinic with annual imaging. Statistical analysis was performed with SPSS 22 (© IBM).

## RESULTS

Patients' mean age was  $65.6 \pm 10.3$  years and 69.2% were male ( $n = 36$ ). Mean follow-up was  $48.1 \pm 34.1$  months. The most frequent surgical indication was thoracic aortic aneurysm (42.1%), followed by chronic type B aortic dissection (35.1%), pseudoaneurysm (10.5%), reintervention by EL (7.0%), penetrating aortic ulcer (3.5%) and traumatic dissection of the aorta (1.8%). Surgery was

elective in 87.7% of cases and part of a dual stage strategy in 17.3%.

In-hospital mortality was 3.9%. Survival at 1, 2 and 5 years was 87.9%, 85.6% and 71.5%, respectively. Reported complications were: need for endovascular reintervention 7.7%; complication of femoral access 7.7%; and cerebellar infarction 1.9%. Throughout follow-up, no EL was detected in 56.1% of patients. There was an incidence of early EL in 38.4%, of which 45.0% had spontaneous resolution, documented in subsequent CT scans. The most frequent was type IA (42.9%) that was also the one with the highest spontaneous resolution rate (62.5%). Mean time to diagnosis of late EL was  $36.9 \pm 21.4$  months and occurred in 11.5% of patients, the most frequent being type IA (50.0%); there was no spontaneous resolution observed. In all cases of reintervention due to EL a good surgical result was obtained.

## CONCLUSION

TEVAR is a procedure with low morbidity and mortality, good long-term outcome and a relatively low incidence of EL. Most patients do not have EL during their follow-up and have an excellent survival. The most frequent early EL is type IA and about half resolve in the following months. Although rare, late EL did not present spontaneous resolution. The treatment of EL can easily be achieved with new intervention and excellent result.



# POSTOPERATIVE ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY

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## INTRODUCTION

Postoperative atrial fibrillation (PoAF) is the most common arrhythmia following cardiac surgery, which increase the patient's morbidity and mortality. Purpose: The aim of this study was to evaluate new onset of atrial fibrillation (AF) after isolated coronary artery bypass grafting (CABG) surgery, its clinical and surgical predictors, and its impact in immediate and long-term outcomes.

## METHODS

Retrospective study including all CABG surgeries performed in a tertiary centre, between 2004 and 2011. 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 informatics databases. Qui-square tests 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 identify independent risk factors of PoAF. To determine the effect of PoAF in long-term survival, we used Kaplan-Meier curves, Log Rank test and multivariate Cox regression (maximum follow-up time: 13 years).

## RESULTS

We included 2511 patients, mean age of  $63 \pm 10$  years, 78.7% being male. PoAF occurred in 450 patients (18.0%),  $3 \pm 3$  days after surgery, the majority

pharmacologically cardioverted with amiodarone (96.2%). These patients were older ( $67 \pm 9$  vs.  $62 \pm 10$  years,  $p < 0.001$ ), more frequently obese (27.8% vs. 22.9%,  $p = 0.026$ ), hypertensive (76.7% vs. 69.7%,  $p = 0.003$ ) and had lower preoperative creatinine clearance (CC) values ( $73.2 \pm 27.4$  vs.  $81.4 \pm 28.3$  ml/min,  $p < 0.001$ ), longer cardiopulmonary bypass time (60.0% vs. 54.8%,  $p = 0.043$ ) compared with patients without PoAF. In multivariate analysis, older age (OR: 1.035, 95% CI: 1.015-1.056,  $p = 0.001$ ), lower preoperative CC values (OR: 0.992, 95% CI: 0.985-0.999,  $p = 0.032$ ) and larger left atrial diameter (OR: 1.058, 95% CI: 1.024-1.093,  $p = 0.001$ ) were determined as independent predictors of PoAF. These patients also revealed longer hospitalization time (8 [4 to 193] vs. 6 [4 to 114] days,  $p < 0.001$ ) and higher hospital mortality (2.9% vs. 0.8%,  $p < 0.001$ ). Regarding long-term survival, patients with PoAF showed lower cumulative survival than patients without AF events (52% vs. 66%,  $p < 0.001$ ). PoAF was also found as an independent predictor of mortality in multivariate Cox regression (HR: 1.394, 95% CI: 1.147-1.695,  $p = 0.001$ ).

## CONCLUSION

PoAF incidence after CABG surgery was 18%. Older age, lower CC values and larger left atrial diameter were settled as PoAF independent predictors. Additionally, the occurrence of this arrhythmia was independently associated with lower long-term survival, after CABG surgery.



# BILATERAL INTERNAL THORACIC ARTERY GRAFTING IN PATIENTS WITH DIABETES MELLITUS

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## INTRODUCTION

Bilateral internal thoracic artery (BITA) grafting in patients with diabetes mellitus is controversial due to a higher risk for sternal infection. The purpose of this study is to compare the rates of mediastinitis as well as mortality rates of BITA grafting to that of single internal thoracic artery (SITA) grafting and saphenous vein grafts in patients with diabetes.

## METHODS

Between 2007 and 2015 all consecutive diabetic patients with multivessel disease who underwent primary coronary artery bypass graft surgery with BITA were compared with patients who underwent coronary artery bypass graft surgery with SITA and saphenous vein grafts (the control group). Patients submitted to single grafts were excluded from the analysis. Propensity score matching was used to account for differences between groups in preoperative characteristics. The frequency of peri-operative mediastinitis was compared between BITA and control group. Mortality rates between were compared between groups at 1-month post-surgery and 2-year post-surgery.

## RESULTS

A total of 1005 patients were included in our sample in which 188 (19%) patients performed BITA grafting. BITA patients were younger (BITA group mean age 60.0 years

vs control group 69.9 years;  $p < 0.001$ ), less often female (BITA group 11.7% vs control group 28.2%;  $p < 0.001$ ), and less often insulin treated (BITA group 9.6% vs control group 18.8%;  $p = 0.002$ ) compared to the control group. All other characteristics were not statistically different between groups, namely CCS, NYHA score, three vessel coronary artery disease, left main disease, previous myocardial infarction, hypertension, COPD and body mass index. After propensity score matching, 344 patients were included in the analysis, 138 in the BITA group and 206 in the control group. In this analysis both groups were not statistically different in every characteristic evaluated including age, sex and insulin-treated diabetic patients. The rate of peri-operative mediastinitis in matched groups was comparable (BITA group 2.3% vs control group 1.5%;  $p = 0.605$ ). Mortality rates were comparable between groups at 1-month post-surgery (BITA group 1.4% vs control group 0.5%;  $p = 0.346$ ) and 2-year post-surgery (BITA group 3% vs control group 2%;  $p = 0.557$ ).

## CONCLUSION

The findings of this sample suggest that the short and mid-term outcomes of patients with diabetes and multivessel disease who undergo BITA grafting is similar to other grafting procedures. BITA grafting in diabetic patients seems to be safe in terms of sternal wound problems. Longer term follow-up is required to determine BITA grafting survival improvement.

# DAVID OPERATION IN THE BICUSPID AORTIC VALVE POPULATION

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## INTRODUCTION

Bicuspid aortic valve (BAV) is the single most common cardiac congenital mal-formation with a prevalence of 1-2%. It is frequently associated with aortic disease including annular ectasia. Increasing evidence suggests that valve-sparing root re-implantation surgery combined with primary aortic valve repair can be performed with good midterm results in patients with BAV.

## METHODS

Our objective is to compare the short and long term results of David procedure in BAV patients with aortic root ectasia. Retrospective analysis of our institution's database retrieved 42 patients with aortic annular ectasia who underwent valve-sparing root re-implantation surgery with David technic from 2007 to 2015. This cohort included 11 patients with BAV and 31 with tricuspid aortic valve (TAV). Pre, intra and post-operative variables of these two groups were statistically analyzed using univariate analysis. Continuous variables are expressed as means+-standard deviation. Categorical variables are expressed as percentages. Univariate analysis was performed using students t-test for continuous variables and x<sup>2</sup> for categorical variables. Long-term survival and freedom from re-intervention was analyzed using Kaplan-Meier curves.

## RESULTS

Follow-up was achieved in 100% of cases with an

average follow-up of 60 months. Mean age of the studied population was 50 years. Comorbidities and demographics were similar in the BAV and TAV groups with the exception of a younger operative age in the BAV group ( $p=0,028$ ). Mean cardiopulmonary bypass time and mean ischemic time was 162' and 133' respectively. Combined procedures were performed in 3 (7,1%) of patients. The BAV group showed longer cardio-pulmonary bypass e aortic cross-clamp times ( $p=0,024$ ;  $p=0,022$ ) and a universal need for aortic plasty. Short-term results and complications were similar in the two groups with the exception of a higher need for pacemaker implantation in the BAV group ( $p<0,001$ ). Post-operative results including in-hospital mortality, stroke, AMI, pre-discharge echocardiographic evaluation and long-term survival and freedom from re-intervention were similar between the two groups.

## CONCLUSION

Our experience reinforces the idea that, however challenging, the aortic valve sparing re-implantation procedure in the setting of BAV, has acceptable short and long-term results, similar to those observed in TAV patients. The pitfalls of this setting are the universal need for aortic valve plasty and higher risk for AV block. A more significant cohort of patients; echocardiographic long-term evaluation and long-term comparison with the gold-standard technic (Bentall procedure) may further clarify the benefits of this approach in BAV patients.

# CLINICAL UTILITY OF FRAILTY SCALES FOR THE PREDICTION OF POSTOPERATIVE COMPLICATIONS: SYSTEMATIC REVIEW AND META-ANALYSIS

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## INTRODUCTION

Frailty can be defined as a biological syndrome of reduced reserve and resistance to stressful events. Evidence suggests that this syndrome is linked to adverse outcomes in various surgical populations. Several instruments have been developed to measure frailty, however there is no consensus about which one is the most useful in the surgical population. Therefore, this study aims to evaluate the utility of different frailty scales in the prediction of postoperative complications in older surgical population.

## METHODS

This review and meta-analysis assembles prospective cohort studies reporting frailty and postoperative outcomes. Searches were performed in PubMed/Medline, Scielo, Cochrane Library and ScienceDirect databases. Statistical analyses was performed using Review Manager software and the pooled Odds Ratios was calculated.

## RESULTS

A total of 15 articles were included in the present review. Frailty was significantly associated with postoperative

complications (OR=2.53, 95% CI: 2.07-3.10;  $p<0.00001$ ), mortality until 30 days (OR=3.49, 95% CI: 2.40-5.09,  $p<0.00001$ ) and higher 1-year mortality (OR= 2.90, 95% CI: 1.99-4.24,  $p<0.00001$ ), and with hospital length of stay  $>5$ days or  $>14$ days (OR=2.78, 95% CI: 1.45-5.30,  $p=0.002$  and OR=2.40 (95% CI: 1.08-5.36,  $p=0.03$ , respectively). In addition, our meta-analysis showed that frailty is a significant predictor of renal failure (OR=5.03, 95% CI: 1.74-14.54,  $p=0.003$ ), neurological complications (OR= 3.41, 95% CI: 1.08-10.73,  $p=0.04$ ), respiratory complications (OR=9.21 (95% CI: 2.35- 36.02,  $p=0.001$ ), wound infection (OR=2.85 (95% CI: 1.65-4.94,  $p=0.0002$ ) and sepsis (OR=3.84 (95% CI: 1.37-10.71,  $p=0.01$ ).

## CONCLUSION

Overall, frailty significantly increases the risk for developing adverse outcomes after surgery, so early detection of frailty may be a window of opportunity for intervention and a key factor for improving clinical outcomes. Moreover, future studies are required for the standardization of the frailty scales used.

# LONG-TERM OUTCOMES IN OCTOGENARIANS FOLLOWING ISOLATED AORTIC VALVE REPLACEMENT

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## INTRODUCTION

Isolated aortic valve replacement (AVR) in elderly patients is associated with increased operative risk, due to higher prevalence of associated risk factors and other comorbidities, making outcome prediction essential. In patients with symptomatic severe aortic disease, advanced age is often a reason for a transcatheter rather than surgical aortic valve replacement. In the era of TAVI, there has been renewed interest in the outcomes of conventional AVR for high and intermediate risk patients. This study evaluates the short and long-term outcomes of elective AVR in elderly patients.

## METHODS

Between July 2011 and May 2015, 100 patients, aged 80 years or older, underwent elective AVR in our unit. The notes of these patients were retrospectively reviewed and follow-up information was obtained from their cardiologists and general practitioners. The average age was  $82.8 \pm 2.3$  years, 53.0% were female, 96.0% had severe aortic valve stenosis and their mean EuroSCORE II was  $4.1 \pm 3.2$  (intermediate risk). Preoperatively, 35.0% of patients were in NYHA class III or IV. Statistical analyses were done using IBM SPSS version 24.

## RESULTS

Median UCI and hospital stay was  $2.0 \pm 3.7$  and  $7.0 \pm 9.5$  days, respectively. Post-operatively, 2 patients required insertion of a permanent pacemaker, 3 patients suffered an ischemic stroke without sequelae, 3 required temporary renal replacement therapy, 7 required re-sternotomy for bleeding, 3 had sternal wound infections. No myocardial infarction was observed. In-hospital mortality was 4.0%, which was in accordance with the mean EuroSCORE II ( $4.1 \pm 3.2$ ,  $p > 0.05$ ). One-year survival was 85.0%, three-year survival was 81.4% and five-year survival was 59.4%. At follow-up, 96.0% of patients were New York Heart Association (NYHA) Class I or II and 2 late endocarditis occurred and were medically treated. Structural valve deterioration was observed in 2 patients at 3 years follow-up.

## CONCLUSION

The outcome after AVR in octogenarians is satisfactory; the operative risk is acceptable and might even be reduced with an individual approach to perioperative management in high-risk patients. Patient age should not be the primary exclusion for conventional cardiac surgery for aortic valve disease.

# CARDIAC SURGERY, WITH SYNCHRONOUS CAROTID ANGIOPLASTY, OUR EXPERIENCE

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## INTRODUCTION

The identification of carotid stenosis in patients proposed for coronary artery bypass grafting, proves that atherosclerosis is a systemic disease. In patients with carotid disease and in need of cardiac surgery, there are still questions about the best method of treatment - medical, surgical or percutaneous, the degree of stenosis considered for intervention and the best time for treatment (pre, peri or postoperative heart surgery). The surgical treatment of the carotid stenosis is currently the gold standard. However, percutaneous treatment has expanded its indications. It is our goal to present the initial results of our experience in the implementation of a synchronous strategy for the treatment of percutaneous carotid disease treatment, followed by cardiac surgery.

## METHODS

Between July/2013 and August/2017, 37 patients were eligible for this procedure. Demographic, perioperative and postoperative data were collected to evaluate the incidence of cerebrovascular complications (severe stroke, death due to stroke, transient ischemic stroke), cardiac complications (acute myocardial infarction (AMI)), or renal impairment.

## RESULTS

The majority of patients (83.7%) were male, with a mean age of 74 years (51-90). Coronary artery disease was the most prevalent surgical indication (59%). Hypertension, dyslipidemia, and smoking, in this order of magnitude, were the most prevalent risk factors. One patient had documented previous stroke. The efficacy of carotid angioplasty was 97.3%, as in one patient it was impossible due to technical reasons. In six patients, the carotid procedure was associated with percutaneous treatment of coronary disease. The interval between both procedures was 1 hour, in average. In-hospital mortality was 5,4% (2 patients) and 1 AMI was documented. Renal injury and atrial fibrillation were the most common complications, found in 27% and 19%, respectively. The mean follow-up time was 523 days (50-1525 days). Two deaths were documented during follow-up. No re-stenosis was found.

## CONCLUSION

The approach presented here (percutaneous treatment of carotid stenosis, concomitant treatment of coronary disease and proximity between procedures) is feasible and effective in reducing the risk of cerebrovascular complications in patients in need of cardiac surgery. Long-term follow-up results, associated with permeability studies, may boost this technique for clinical acceptance, with changes in guidelines, in this set of patients.

# SEVERE INTRAOPERATIVE COMPLICATIONS DURING VATS ANATOMICAL RESSECTIONS AND THEIR SURGICAL RESOLUTION IN A PORTUGUESE THORACIC SURGERY CENTRE – A 9-YEAR REVIEW

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## INTRODUCTION

Many studies have demonstrated that video-assisted thoracoscopic surgery (VATS) is not only feasible and safe but is actually the approach chosen for an increasing number of pulmonary anatomic resections. There are however few studies reporting on severe intraoperative complications during VATS anatomical resections and their resolution. Objective: Our aim is to analyse the incidence of severe intraoperative complications during VATS anatomical resections, at our department, in the past nine years, and describe their technical resolution during the surgery.

## METHODS

We performed the retrospective analysis of the patients submitted to lobectomy, bilobectomy or segmentectomy by VATS or VATS converted to thoracotomy at Hospital de Santa Marta, between May 2008 and September 2017.

Severe intraoperative complications were defined as an event that results in a life threatening situation or an injury to a proximal airway, blood vessel or organ that would lead to an unplanned additional anatomical resection.

## RESULTS

A total of 151 patients were submitted to anatomical resections, 90,7% (n=137) of them for a primary lung cancer, other indications were metastatic disease 6%(n=9)

and benign disease in 3,3% (n=5). The surgery was a lobectomy in 94% of the cases (n=142), a segmentectomy in 5% (n=8), and one bilobectomy. The conversion rate to thoracotomy was 12% (n=18), most of which were for technical/oncological reasons (n=11), and 7 others were to control bleeding. Four (2,6%) severe intraoperative complications were identified. Three of them (2%) were erroneous transections of bronchovascular structures (left main bronchus, left main pulmonary artery and both left pulmonary veins); and one was a membranous airway injury proximal to the staple line. There were no intraoperative deaths. The three patients with erroneous bronchovascular transection were converted to thoracotomy and the bronchial or vascular re-anastomosis was performed, therefore avoiding a left pneumonectomy. In the patient with the membranous airway injury, the bronchoplastic suture was performed by VATS.

All four patients were primary lung cancer patients. In all these cases the patients were discharged alive and well and are undergoing their follow-up program with no signs of disease recurrence.

## CONCLUSION

Albeit rare, severe complications during VATS Lobectomy can occur but when they happen the thoracic surgeon has to be ready to solve them with the minimal repercussion for the patient.

# THREE-YEAR EXPERIENCE ON 477 PATIENTS UNDERGOING UNIPORTAL VIDEO-ASSISTED THORACOSCOPIC SURGERY

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## INTRODUCTION

Uniportal video-assisted thoracic surgery (VATS) technique has been described both for diagnostic and therapeutic indications. Outcomes after uniportal VATS have never been reported in Portuguese large series. We review the safety and efficiency of our initial experience with uniportal VATS.

## METHODS

In a retrospective study of prospectively collected data, 477 uniportal VATS procedures were analyzed between June 2014 and June 2017. All procedures were performed without rib spreading. Patients' demographic data, preoperative and postoperative management as well as results were analyzed.

## RESULTS

The mean age of patients was 47,9 years (range, 10 to 86), and 155 (32,5%) patients were female. The uniportal VATS procedures included 156 (32,7%) anatomical major lung resections, 80 (16,8%) one or multiple wedge resections, 172 (36,1%) blebectomies and/

or pleurectomies, 24 (5%) mediastinal lesions, 16 (3,3%) empyema drainage and decortications and other indications in 29 (6,1%) cases. Median operative time and surgical drainage for uniportal VATS for anatomical major lung resections was 95 minutes (range, 40 to 245) and 100 ml (range, 0 to 650), respectively. Conversion to either 2 or 3 port VATS or mini-thoracotomy was necessary in 7.1% of the surgeries, often due to adhesions, incomplete lung collapse or bleeding. The chest drain was removed after a median of 3 days (range, 0 to 34). Median hospital stay was 3 days (range, 1 to 41). Postoperative complication rate was 12,4% mainly due to prolonged air leak 8,4% (n=40). There was no perioperative mortality.

## CONCLUSION

Uniportal VATS is a feasible and safe technique for various indications in thoracic surgery. The perioperative results are promising. Excellent results with minimal morbidity and short hospital stay are amongst its strong points. It can be performed by thoracic surgeons experienced in the postero-lateral thoracotomy approach.



# UNIPORTAL VIDEO-ASSISTED THORACOSCOPIC SURGERY – THE NEW PARADIGM IN THE SURGICAL TREATMENT OF LUNG CANCER

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## INTRODUCTION

The progressive development and improvement of minimally invasive approaches in the field of thoracic surgery allowed to establish video-assisted thoracoscopic (VATS) anatomic lung resections as the present technique of choice in the treatment of early stage lung cancer.

## METHODS

The purpose of this study was to evaluate the surgical outcomes of patients who performed uniportal VATS anatomic lung resections for the treatment of primary lung cancer. The patients' demographics, approach and type of surgery, postoperative morbidity and mortality and overall survival were analyzed.

## RESULTS

From December 2013 through September 2017, 173 patients underwent uniportal VATS anatomic lung resections for the treatment of lung cancer. Surgery was performed in 92 male and 81 female with a mean age of 63.5 years (range 19- 83 years). All surgeries began by a single-port VATS approach, being necessary to add an extra port in 9 surgeries and conversion to mini-thoracotomy in 10 procedures (conversion rate of 5.8%) due to bleeding and/or technical difficulties. All kinds of anatomic lung resection were performed: 154 lobectomies, which represents 89.0% of the procedures (93 upper lobectomies, 12 middle lobectomies and 49 lower lobectomies), 10 bilobectomies

(5.8%) and 9 anatomic segmentectomies (5.2%). Mean lymph node stations dissected was 2.48 stations (range 1-8 stations). The mean surgical time was 112.2 minutes (range 40-245 minutes) and mean intra-operative drainage was 155.6ml (range 0-1400ml). Median hospitalization time was 5 days (range 2-28 days). There was no operative or 30-days mortality and the main complication observed was persistent air leakage in 38 patients (22.0%). Non-small-cell lung cancer (NSCLC) was the main histologic type of cancer (n=149; 86.1%), followed by carcinoid tumours (n=20; 11.6%) and other histologic type (n=4; 2.3%). The mean follow-up time was 15 months (range 0-45 months) and the overall survival was 94.5%.

## CONCLUSION

We believe that uniportal VATS anatomic lung resection with systematic lymphadenectomy is technically safe and feasible and it is an alternative approach to thoracotomy or conventional thoracoscopic in the treatment of lung cancer. This approach has demonstrated to be reproducible, comprising all the advantages of a minimal invasive surgery, without jeopardizing the efficiency of the oncologic treatment. Therefore, we suggest that this technique could have a broader implementation and development in all national surgical centers. The issues of patient acceptability, cosmetic and oncologic results, and cost-effectiveness remain to be determined in the future throughout multi-institution randomized controlled trials and long-term follow-up.

# MAJOR COMPLICATIONS OF VIDEOMEDIASTINOSCOPY AND THEIR RESOLUTION – A 5 YEAR EXPERIENCE

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## INTRODUCTION

Videomediastinoscopy is an invasive procedure for mediastinal assessment, with low rates of morbidity and mortality. Despite the low risk of complications, they can be potentially lethal if not immediately controlled. Objective: The goal of this study is to analyse the overall incidence of complications of videomediastinoscopies, performed in the last 5 years at our department, as well as their resolution and outcomes.

## METHODS

A retrospective review of all videomediastinoscopies performed at a single institution during a 5-year period was performed. Major complications were defined as life-threatening events.

## RESULTS

During the study period, from July 2012 to July 2017, were performed 160 mediastinoscopies, 67 were diagnostic and 93 for staging. There were 3 major

complications (1.87%), of which a severe haemorrhage from a bronchial artery, a tracheal rupture, and a massive haemorrhage from an innominate artery laceration. In this 3 cases, the diagnosis were lung cancer in 2 patients and lymphoma in the other one. There were no intraoperative deaths. One patient died in the postoperative period due to mediastinitis and disease progression. The patient who suffered innominate artery laceration, had a stroke due to dissection of the right carotid artery. During follow-up, one patient died from progression of oncologic disease, and the other one is alive 4 years later.

## CONCLUSION

Although mediastinoscopy has a low rate of complications, these can be potentially lethal and the thoracic surgeon should be able to resolve them rapidly. Due to the scarcity of publications on this subject, it is important to describe potential complications of this surgical procedure and their clinical resolution.

# SURGICAL TREATMENT OF COMPLICATIONS 55 YEARS AFTER EXTRAPERIOSTEAL LUCITE BALL PLOMBAGE FOR PULMONARY TUBERCULOSIS

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## INTRODUCTION

In the 1930-50s, before the introduction of antimicrobial drugs and development of techniques of pulmonary resection, collapse therapy was the mainstream of treatment for cavitary pulmonary tuberculosis. The methods to achieve the collapse included artificial pneumothorax with air refills, phrenic nerve crush, thoracoplasty and extrapleural plombage. The plombage involves creating a cavity surgically under the ribs in the upper chest wall and filling the space with inert material, such fat, paraffin wax, rubber balloons, oil and methyl-methacrylate (Lucite) balls. The theory behind Plombage treatment is that collapse of the lung promote de healing process and limit the spread of tuberculous infection to other areas of the lung. However, with time, the presence of these materials for a prolonged period of time resulted in complications, such as erosion of major vessels, respiratory insufficiency, infection and migration.

## METHODS

We present a clinical case of one patient presented with a late complication of lucite ball plombage after 55 years.

## RESULTS

An 78-year-old man with a history of pulmonary tuberculosis treated with plombage in 1962, ischemic heart

disease, hypertension and diabetes mellitus, was admitted to hospital for axillary swelling and pleurocutaneous fistula. The x-ray of the chest and computed tomography showed the apex of the left hemithorax filled with multiple lucite balls, each approximately 2,5cm in diameter, and extrusion of a ball into the axillary fistulous tract. In this context, the patient complied with multiple antibiotic regimens without success. So, the patient was submitted to surgical extraction of 21 lucite balls, pleurocutaneous drainage and thoracoplasty (7 ribs and the tip of the scapula was remove). The cultures turned out to be negative and the patient made an unevenful recovery with discharge on the 19th postoperative day. Pathologic examination revealed active chronic inflammatory process and negative microorganism screening.

## CONCLUSION

Despite the rapid decline in collapse therapy since the appearance of antitubercular chemotherapy, there are still such elderly patients who remain asymptomatic while carrying residual plombage material. There is no need for routine ablation of any this material, however if any foreign material becomes a source of complication should be extracted without delay. As the number of living patients treated by plombage is attenuating rapidly, fewer and fewer will be seen in the future, and no one is likely to accumulate considerable experience with this problem.

# UNUSUAL BEHAVIOR OF A LUNG INFLAMMATORY MYOFIBROBLASTIC TUMOR: CASE REPORT

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## INTRODUCTION

55 years old, male patient. History of heavy smoking (65 UMA) and COPD. Admitted to hospital due to a left pneumonia. Thoracic CT and PET-Scan, showed left lower lobe mass measuring 92x89 mm (SUVmax 49). Several mediastinal node groups presented increased uptake of FDG. A fiberoptic bronchoscopy was performed. Cytology of the bronchoalveolar lavage suggested a squamous carcinoma. EBUS of node stations 4R, 4L e 7 without evidence of malignancy.

## METHODS

The case was taken to a multidisciplinary meeting staged as IIIA (T3N2M0). Neoadjuvant therapy (four cycles cisplatin and gemcitabine) was decided based on station 5, suspected disease. A left lower lobectomy was performed after a cervical mediastinoscopy excluded metastasis of node stations 4R and 4L. Histology of the specimen was compatible with inflammatory myofibroblastic tumor (IMT). No lymph node involvement was reported. It was restaged as IIB (ypT3N0M0).

## RESULTS

Three months after surgery one de novo nodule in the lingula with 12,7 of SUVmax was reported. The nodule was removed confirming a IMT metastasis. Four months after the nodule resection a CT showed new lung and liver

nodules. A total occlusion of the left main bronchus was documented and bronchoscopic debulking of the endobronchial mass again revealed IMT. Palliative radiotherapy was decided in the multidisciplinary group targeting the left main bronchus (five sessions of radiotherapy on a dose of 20Gy in 4Gy daily fractions). Ten months after surgery due to the onset of back pain, a CT revealed a sacrum lesion whose needle biopsy was suspicious for multiple myeloma. The patient was referred to another oncological center where previous non-surgical cases had been sent in the past. The patient is now proposed for histology reassessment and discussion by the hematology and pneumology medical teams.

## CONCLUSION

Inflammatory myofibroblastic tumors are considered benign or low-grade malignant tumors. The size of the tumour (cut-off of 3 cm) and secure surgical resection with free margins are the major determinants for recurrence and survival. There are some cases reported in the literature of distant metastasis and sarcomatous transformation after multiple recurrences.

In our patient, the lesion was bigger than 3 cm and he underwent a complete resection.

Nothing could foresee this aggressive metastatic behavior, especially when the recurrence did not show a sarcomatous transformation.

# UNIPORTAL VATS LOBECTOMY: SUBXIPHOID APPROACH

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## INTRODUCTION

Interest in uniportal video-assisted thoracic surgery (VATS) is rapidly growing worldwide because it represents the surgical approach to the lung with the least possible trauma and in recent years the subxiphoid approach has been used in the field of thoracic surgery as it is associated with lesser pain because there is no intercostal nerve damage and it provides excellent cosmetic outcomes. This technique was recently introduced for major pulmonary resections and even bilateral approaches in selected patients.

## METHODS

We present a case of a 66 years old male, former smoker (45 unit pack year) who had a thorax CT (computerized tomography) scan for worsening complaints of cough with sputum production. The CT scan revealed a right upper lobe nodule (16x14mm) with ground glass density and fissure retraction. The pulmonary function tests showed mild bronchial and bronchiolar obstruction. It was decided to undergo surgical treatment. The surgical approach was a subxiphoid uniportal lung resection.

## RESULTS

The patient was positioned in a left lateral position with 60 degrees of inclination. The surgeon and scrub nurse were located in front of the patient and the assistant in the opposite side. A 3cm midline vertical incision was made

below the sterno-costal triangle. The rectus abdominis was divided and the xiphoid process was partially resected. The right pleura was opened by finger dissection. The pericardial fatty tissue was removed and a soft tissue retractor was placed. A 10- mm, 30-degree video camera and double articulated instruments combined with several specific longer VATS instruments were used through the same subxiphoid incision. It was performed a wedge resection and after the diagnosis of adenocarcinoma in the intraoperative histological examination, the patient underwent a right upper lobectomy and complete mediastinal lymphadenectomy by the same approach. The post-operative period was uneventful, the chest tube was removed in the third postoperative day. The pain control was excellent, with a maximum of pain grade 1 in the Visual Analogue Scale. The patient was discharged in the fourth postoperative day.

## CONCLUSION

The subxiphoid approach is a variant of uniportal VATS approach without opening the intercostal space with its striking advantages in terms of pain control and cosmetics in selected patients. However, this technique has yet some limitations such as the control of major bleeding and the performance of a complete oncologic lymph node dissection related to its surgical complexity expected in emerging techniques. Further studies are necessary to certify the feasibility, safety and benefits of this approach.

# BILATERAL RECURRENT SPONTANEOUS PNEUMOTHORAX AS A LATE CONSEQUENCE OF OESOPHAGEAL SURGERY: CASE REPORT

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## INTRODUCTION

We report a case of a patient with recurrent bilateral spontaneous pneumothorax presumably originating in a left bulla.

## METHODS

A 68 year old male, was admitted to the emergency department with shortness of breath and bilateral chest pain. He had had oesophageal cancer resection 2 years before, with a posterior mediastinal reconstruction using a gastric tube. Afterwards he had to be operated twice for hiatal hernia.

## RESULTS

Bilateral chest tubes were inserted, with complete resolution in 72 hours. He was readmitted 20 days later, with a bilateral recurrence. A pneumologist was called upon. The thoracic CT scan revealed large bulla in the left upper lobe. There was no evidence of pneumomediastinum or mediastinal fluid collections. Communication between the two pleura was suspected. After discussion with the surgeon responsible for the previous interventions only the left chest was drained with bilateral lung expansion after suction. A left VATS approach revealed a partially adherent left lung, in its mediastinal face. Inflated bulla could be partially observed firmly glued to the upper mediastinum. A leak could not be demonstrated within the left thorax. Due to

the firm adhesions of a presumably nonruptured bulla to the phrenic nerve, a decision was made not to dissect it. A pleurectomy was performed. In the 3 days that followed, the fistula persisted and increased, in spite of lung expansion. A left thoracotomy was then performed. The full extent of the anterior mediastinal face of then left lung was dissected by opening the bulla that were partially left on the mediastinal pleura. Resection was made using tristaple endoGIA staplers<sup>®</sup>. The posterior mediastinum was manually dissected free up to the presumed gastric tube location. At the end



of surgery, no major air leaks were documented. Communication with the right pleura could not be located, not even with the aid of a 30o camera, but a large amount of fluid (1000cc) missing, was recovered after turning the patient. The postoperative period was prolonged ut to the 16th day, by a small but persistent air leak.

#### CONCLUSION

Although no visual proof of communication between the two pleural cavities could be found, the control of the right pneumotorax by contralateral drainage, the resolution of the case by left pleurectomy and bulla resection backup this theory. This is an unique case, not previously reported, resolved by a multidisciplinary discussion of all the specialists involved in the treatment.





# SURGICAL TREATMENT FOR ELDERLY PATIENTS WITH LUNG CANCER

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## INTRODUCTION

Non-small cell lung cancer is a very common disease in the elderly population and its incidence in this particular population is expected to increase further, because of the ageing of the Western population. Pulmonary resection is often not recommended in the elderly, even though they have no medical contraindications to surgery. Such patients are postulated to have a limited life expectancy, the rate of complications and perioperative death is considered to be higher than younger population. However, decision making is extremely difficult, since this group is under-represented in clinical trials.

## METHODS

This study aims to do a retrospective analysis of comorbidity, surgical procedures and post-operative complications for surgery in patients older than 70 years of age who underwent a pulmonary resection for lung cancer. We analysed the clinical records of all patients with Non-small cell lung cancer submitted to surgery during the period 2012 to 2016 in our department and divide them in 2 groups: elderly group (more than 70 years old) and group control.

## RESULTS

In the five years study period, our department

performed pulmonary resection in 601 patients with NSCLC, of whom 209 (34,8%) were 70 years and older. The mean age was 74,6 years old in the elderly group and 58,6 in the control group. Preoperative comorbidities such as cardiac and previous neoplastic diseases were more frequent in the elderly group, and the percentage of smokers was higher in the control group (80,1% vs 61,7%). A segmentar or wedge resection was performed more frequent for the elderly group (16,7%) than in the control group (6,6%), whereas pneumonectomies and lobectomies were performed more frequently. The ratio of post-operative complications, especially cardiac complications, was higher in the elderly patients (12,9% vs 8,2%), however, there was no significant difference in prevalence of pulmonary/respiratory complications, such as pulmonary leakage, pneumonia or empyema between the 2 groups. There was no operative or hospital death in any of the groups.

## CONCLUSION

Advanced age alone is not a contraindication to surgical resection on NSCLC. Elderly patients should be offered the best treatment possible, considering surgical risk on an individualized basis, and keeping in mind that surgery offers the best results when the disease is resectable.

# WHAT ABOUT HAVING A HYDROPNEUMOTHORAX EVERY MONTH?

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## INTRODUCTION

Endometriosis is a pathological, benign, inflammatory condition characterized by the presence of endometrial glands and stroma outside the uterine cavity, typically in the pelvis. In rare conditions, this estrogen-dependent disease may be extrapelvic, presenting with a variety of symptoms, including Thoracic Endometriosis.

## METHODS

A 37 year-old woman presented with her third right hydropneumothorax in three months. Her medical history included infertility, an ovarian mass (in study), biliary dyskinesia and protein C deficiency. The CT showed a bleb in the right inferior lobe and a pleural effusion. A detailed clinical history revealed a temporal relationship of the hydropneumothoraxes and her menses.

## RESULTS

She underwent a videothoracoscopy: there were macroscopic tissue alterations all over the parietal and visceral pleura. We performed a biopsy of one of those spots (of the parietal pleura) and an atypical resection of

the apex of the apical segment of the right inferior lobe, where the bleb was. A talc pleurodesis was also performed. The patient was discharged at day 1 and is currently under regular follow-up in ambulatory, with no recurrent pneumothoraxes for two months. The histopathology was compatible with a pleural Endometriosis.

## CONCLUSION

Thoracic endometriosis is a clinical diagnosis, although the histopathologic confirmation is preferred (but not necessary): it should be suspected in reproductive age women who present with hemothorax, pneumothorax, hemoptysis, chest or scapular pain, lung nodules or diaphragmatic rupture perimenstrually, especially right-sided. Most commonly it presents as catamenial pneumothorax and/or hemothorax. Those with high clinical suspicion and/or imaging supportive of the diagnosis, should undergo an interventional procedure (thoracoscopy), both for diagnosis and management. Primary treatment is chest tube drainage. Prevention of recurrence can be medical (hormonal suppression) or surgical (lung resection, pleurectomy, pleurodesis).

# SMAJOR HEMORRHAGE DURING MEDIASTINOSCOPY: DO YOU PANIC OR DO YOU HAVE A PROTOCOL?

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## INTRODUCTION

Although uncommon, major vessel hemorrhage is the most feared complication of mediastinoscopy. Our goal was to determine the optimal management strategy and to develop a simple and accessible protocol for optimizing care in these situations.

## METHODS

Data collection after reviewing the relevant literature. A literature review was conducted using the following databases: PubMed, Medline, Embase and ScienceDirect.

## RESULTS

The protocol consists of three distinct parts - initial checklist, considerations in minor bleeding and performance in major bleeding. In this last section we propose an initial approach based mainly on fluid resuscitation and immediate surgical correction if the former has not been successful.

## CONCLUSION

Mediastinoscopy continues to be an important and effective diagnostic tool. However, it can cause important iatrogenic lesions which the anesthesiologist and surgical team must be prepared to diagnose early and treat properly.

# AMNIOTIC MEMBRANE IN THE TREATMENT OF VARICOSE VARICOSE ULCERS A CENTER EXPERIENCE

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## INTRODUCTION

Amniotic membrane (AM) is an option as a cover in varicose leg ulcers, promoting epithelization. Anti-inflammatory and analgesic proprieties are described, as well as high levels of growth factors and angiogenesis. The costs are inferior to surgical plasty.

The aim of this work is to describe the results of AM in the treatment of varicose leg ulcers in a group of patients refractory to the best medical treatment.

## METHODS

A pilot prospective trial was conducted. Thirteen patients were selected for the treatment with AM from an outpatient clinic.

The inclusion criteria included: ulcer area inferior to 100 cm<sup>2</sup>, ulcer size variation inferior to 30% in the last month, duration superior to 2 years and refractory to best medical treatment including compressive therapy. The exclusion criteria were ABI>0,8m active infection, bone

exposure, severe myopathy of the low limb and acute decompensation of systemic chronic disease. The first five cases were applied on the enfermary (mean stay 3 days), the last 8 patients were applied in the outpatient clinic.

After the treatment behavioral reinforcement was made.

## RESULTS

The mean sample age was 56 YO (50-71), 70% were female, 30% were diabetic, and post-thrombotic syndrome was present in 54% (7), only one patient was an active smoker.

After 2 years a recurrence was observed in 23% (3) cases.

## CONCLUSION

AM is effective in the treatment of varicose ulcers unresponsive to best medical treatment.

# WHICH ANEURYSM CHARACTERISTICS PREDICT EVAR NONSUCCESS?

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## INTRODUCTION

Hostile anatomic characteristics in patients undergoing endovascular abdominal aortic aneurysm repair (EVAR) may lead to technical nonsuccess of the procedure, late complications, reintervention or death. The authors analyzed anatomical abdominal aortic aneurysm specific considerations so as technical endoprosthesis implantation and correlate them with endoleak development and postoperative survival.

## METHODS

Authors retrospectively reviewed all consecutive, elective, EVAR's that occurred between 2010 and 2016, with available data, at one institution for abdominal, infra renal, aortic aneurysms. The patients comorbidities were registered and preoperative CT scan was analyzed considering the proximal zone (diameter, length, presence of thrombus or calcification), the distal zone (length and diameter), aortic aneurysm (maximum diameter, angulation, axis deviation, mural thrombus and patency of the inferior mesenteric artery and the lumbar arteries) and concomitant iliac aneurysm or peripheral occlusive disease. Outcomes were endoleak development and death.

## RESULTS

We analyzed 56 patients, 54 (96%) male with a medium age of 78 (min 61, max 89) years. During a medium 3,4 years of follow up, 12 (21%) patients developed

endoleak (10 type II and 2 type I) and 18 (32%) died. The adjusted analysis showed a statistically significant association between aneurysm angulation ( $p=0,046$ ), patency of the inferior mesenteric artery and the lumbar arteries ( $p=0,044$ ) and aneurysm diameter ( $p=0,009$ ) with endoleak development. Notice that 40% of the aneurysms that impaired a significant axis deviation developed endoleak. All except one endoleak were diagnosed within the first year after EVAR.

None of the deaths that occurred during the follow up period were correlated to post intervention aneurysm enlargement or rupture. However we found a statistically significant association between patency of the inferior mesenteric artery and the lumbar arteries ( $p=0,042$ ) and early death during the first year after EVAR.

## CONCLUSION

Even though many aneurysm are suitable for EVAR, unfavorable aneurysm morphologic characteristics and predictable complicated endograft placement should be taken into consideration. For such clinical cases, a surgical approach should be considered. We believe that current recommendations for follow up with angioCT only at 1 and 12 months during the first year following EVAR is a good practice conduction since most of endoleaks developed during these period. If neither endoleak nor aneurysm enlargement is documented during first year after EVAR, colour duplex ultrasonography is a good alternative for annual postoperative surveillance.

# RENAL AUTOTRANSPLANTATION – THE SOLUTION FOR DIFFERENT PATHOLOGIES

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## INTRODUCTION

Renal autotransplantation (RA) is a safe and effective procedure to reconstruct the urinary tract which first successful surgery was performed by Hardy in 1963. The main indications reported for performing RA generally includes renovascular disease, ureteral pathologies and neoplastic disease. RA may be also useful as the last recourse in preventing kidney loss in highly selected patients, especially when conventional methods have failed.

## METHODS

The authors pretend to describe four total different situations where the RA was the key solution for the pathology initially presented.

## RESULTS

1- 52 years old male with a previous history of right nephrectomy that occurred during an exacerbation of his basal Chron disease so as left ureter cutaneostomie, presented with repetitive urinary tract infections that led to renal function impairment; 2- 57 years old female with the diagnosis of renal artery aneurysm while being studied as a potential renal donor; 3- 49 years old male admitted in the emergency room after a penetrating trauma which conditioned bowel and ureteral lesions with postoperative consecutive and recurrent peritoneal infections that

compounded a necessity for a left ureter cutaneostomie, that the patient accurately refused; 4- 24 years old female with the diagnosis of Nutcracker syndrome identified after being studied regarding repetitive urgency admissions with frank hematuria. Every patient was submitted to RA. The intervention and postoperative course were uneventful. We performed an ultrasound evaluation on the day after each procedure to attest normal renal perfusion.

## CONCLUSION

The RA were realized in the two patients with ureteral lesions because there was no viable alternative but kidney loss. The other two clinical cases were treated with RA because they concerned a complex renovascular disease (one arterial and the other venous). Despite the existence of an endovascular option for these patients, long term follow up studies are still lacking. The RA is a viable option in specific situations for kidney salvage. The recent development of laparoscopic nephrectomy significantly decreased the surgical hostility to the patient and promoted the RA value on the treatment of complex vascular pathologies, traumatic disease and specific medical situations. It represents a credible alternative with attested results already described in the literature thus requiring a vast Institutional experience with conventional renal transplantation.

# ABDOMINAL AORTIC ANEURYSM IN WOMEN: RETROSPECTIVE ANALYSIS OF THE CASES THAT UNDERGO SURGICAL REPAIR

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<sup>1</sup> CHUC;

## INTRODUCTION

The prevalence of infra-renal aortic abdominal aneurysms (AAA) is about 3 to 4 times higher in men, with a recommendation I 1a for screening men > 65y. Although women only represent 20% of the total AAAs they have a significant higher rupture rate – threefold higher – and a worse outcome after ruptured AAA repair. Screening is not consensual but can be recommended for women > 65y who have smoked or have a family history of AAA. Against screening is the fact that the AAA in women have not only a lower incidence but also a late presentation (>80y) but references have been made to the fact that smoking became popular more than 30 years after than men and so the effects just now can start to be seen.

## METHODS

A retrospective review was made to all women with an infra-renal AAA who undergo a surgical treatment, elective or urgent, in the past 7 years (January 2010 – August 2017) in our hospital. Information was obtained through the clinical process. It was made an evaluation of the demographic information and anatomic features.

## RESULTS

15 cases were reviewed, 4 elective and 11 ruptured surgical repairs. The mean age was 74 and only 4 women were more than 80 years old, with a minimum age of 57. More than half the patients were previously diagnosis with hypertension but only 30% had high cholesterol. Only one was a known smoker. None had a diagnosis of cardiac disease. One had a sintomatic cerebrovascular disease. Within the elective cases, all open repair, the intra-hospital mortality was zero with a mean stay of 7,5 days. The ruptured cases, 1 endovascular, had a perioperative mortality of 50%. The mean aortic diameter at rupture was less than 6 cm.

## CONCLUSION

Data supports the evidence of the morbidity of a ruptured AAA and the high intra-hospital mortality in women. Early detection and elective repair should be considered. Sex-specific research is needed to provide the best medical treatment.



# INSTITUTIONAL PROTOCOL FOR PREVENTION OF TEVAR-RELATED SPINAL CORD ISCHEMIA – THE FIRST 9 CASES

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## INTRODUCTION

Spinal cord ischemia (SCI) is a feared complication after endovascular correction of thoracic aortic diseases (TEVAR). The guidelines of the European Society for Vascular Surgery recommend prophylactic lumbar drainage (LD) of cerebrospinal fluid in high-risk patients undergoing TEVAR. Our institutional protocol considers as high-risk patients as: coverage of the origin of the Adamkiewicz artery (T9-T12), aortic coverage >15 cm, involvement of collaterals (treated or untreated abdominal aortic aneurysm, left subclavian artery revascularization or bilateral occlusion of the internal iliac arteries) and symptomatic SCI. The objective of the study was to demonstrate the efficacy and safety of LD in preventing or treating SCI after TEVAR.

## METHODS

Patients submitted to LD in the perioperative period of TEVAR under the institutional protocol, between May 2015 and April 2017, were prospectively included. Primary Outcome: prevention and/or reversal of neurological symptoms (efficacy). Secondary Outcome: complications related to the technique (safety).

## RESULTS

We included 8 patients with thoracoabdominal aneurysms and 1 patient with type B aortic dissection, aged 63- 75 years. Eight interventions were elective and one was urgent. The LD catheter was placed before surgery in 8 cases and in the postoperative period in 1 case due to symptomatology of SCI that reverted after liquor drainage. Of those placed pre-operatively, 2 had symptoms of SCI in the postoperative period, which alleviated with increased drainage and hemodynamic and hemoglobin optimization. The patient undergoing urgent TEVAR for ruptured thoracoabdominal aneurysm evolved with multiorgan dysfunction and death 24 hours after surgery. There were no other complications.

## CONCLUSION

In this initial experience, the institutional protocol with LD placement proved to be safe and effective in preventing and treating SCI after TEVAR.

# ANEURYSMS OF THE UPPER LIMB: REVIEW OF AN EXPERIENCE

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## INTRODUCTION

True arterial aneurysms of the upper limb are rare and their treatment is intended to avoid complications as distal embolization or compression of surrounding neurovascular structures. The purpose of this study is to review the experience in the surgical treatment of true arterial aneurysms of the upper limb.

## METHODS

Retrospective study of patients with true arterial aneurysms of the upper limb surgically treated between January 2007 and August 2017. Nine patients were identified and data was collected regarding sex, age, past medical history, aneurysm's aetiology, surgical procedure, complications and the need for re-intervention.

## RESULTS

From a total of nine patients, seven were male and two were female, with ages between 29 and 68 years old (medium age of 55,5). One of the patients had surgery twice because of two aneurysms of the upper limb. From a total of 10 cases, two were subclavian, one was axillary

and seven were brachial aneurysms. Three of them had degenerative/idiopathic aetiology, one was associated to a cervical rib and six occurred in the setting of arteriovenous fistula or kidney graft. Three patients had emergent surgery and the others had elective surgery. All of them were submitted to aneurysmectomy. As 30-day complications, there were two haematomas, one compartment syndrome and two early graft occlusions. Four patients needed re-intervention. During the follow-up period, all the grafts initially preserved were patent. There were no further known complications or amputation procedures. One of the patients who had emergent surgery and presented with finger paresis remained with hypomotility after the surgery.

## CONCLUSION

True arterial aneurysms of the upper limb are uncommon. In this review most of the aneurysms were found in patients with haemodialysis vascular access or kidney grafts. Despite the need for early re-intervention in some cases, the surgical treatment of true arterial aneurysms of the upper limb is a low morbidity procedure.

# ENDOTHELIAL FUNCTION AND VASCULAR PROPERTIES IN SEVERE AORTIC STENOSIS BEFORE AND AFTER AORTIC VALVE REPLACEMENT SURGERY

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## INTRODUCTION

The degenerative process that results in aortic valve stenosis (AS) has pathophysiological features similar to the atherosclerotic process. We therefore hypothesized that, as in atherosclerosis, endothelial and vascular dysfunction could be a pathophysiologic feature of AS. Aim: To evaluate endothelial function before and after aortic valve replacement (AVR) surgery in patients with severe AS. To correlate endothelial function with severity of AS and clinical profile.

## METHODS

Two noninvasive methods were used to evaluate endothelial function (Reactive Hyperemia Index (RHI) measure with EndoPAT™2000 system) and vascular properties (carotid-femoral Pulse Wave Velocity (PWV) measured by Complior® Analyse) in 13 patients with severe AS undergoing AVR. Sample was collected by convenience in a single-center between February and July of 2017. Pre-operative, surgical and post-operative data were collected through clinical files and informatics databases. PWV, RHI, Augmentation Index (AI) were assessed at the day of surgery and 2.4±1.2 months post-operatively. Mean transvalvular gradients (MTG), aortic valve area (AVA) and left ventricular function were evaluated by transthoracic echocardiography at 3.4±1.6 months of follow-up. Wilcoxon or paired t-tests were used to compare pre- and post-operative values of continuous variables. Spearman correlations

(rho) were done to find associations between endothelial/vascular function parameters and clinical data.

## RESULTS

In our sample, mean age was 70±8 years and 69% were females. Arterial hypertension was present in 11 (85%) patients, diabetes in 3 (23%) and pre-operative NYHA functional class ≥III in 4 (31%). No patient was currently smoker and only 2 had previous history of smoking. No significant changes were observed between pre- and post-operative endothelial/vascular function values. PWV (m/s), AI (%) and RHI before and after AVR surgery were: 10.5 (6.1 to 16) vs. 9.4 (4.7 to 21.6),  $p=0.701$ ; 33% [-24 to 54] vs. 23% [0 to 47],  $p=0.116$  and 1.83 (1.08 to 3.13) vs. 1.71 (1.06 to 3.12),  $p=0.638$ , respectively. We found a significant inverse correlation between pre-operative AVA and AI ( $\rho=-0.652$ ,  $p=0.016$ ) and a positive correlation between age and post-operative PWV ( $\rho=0.639$ ,  $p=0.019$ ). Pre- and post-operative MTG and AVA were 54±5 mmHg and 0.7±0.1 cm<sup>2</sup> vs. 12±4 mmHg and 2.0±0.5 cm<sup>2</sup>, respectively ( $p<0.001$ ).

## CONCLUSION

Considering small sample size, no differences were found in indices of endothelial/vascular function before and after AVR surgery due to AS. However, it seems that endothelial dysfunction is associated with severity of AS assessed by AVA.

# PREDICTORS OF ACUTE KIDNEY INJURY IN THE POSTOPERATIVE PERIOD OF CARDIAC SURGERY ASSOCIATED WITH CARDIOPULMONARY BYPASS

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## INTRODUCTION

Acute kidney injury (AKI) in the postoperative period of cardiac surgery occurs in 1 to 30% of the patients, mainly caused by ischemia secondary to renal hypoperfusion. Cardiopulmonary bypass (CPB) has a deleterious effect on renal function, constituting an aggression to the patient's homeostasis. Aim: To evaluate the incidence of AKI in the postoperative period of cardiac surgery in patients without preoperative renal insufficiency who underwent cardiac surgery with CPB, and explore the association between incidence of AKI and predictors related to CPB.

## METHODS

Observational, retrospective, cross-sectional study. Participants were divided in two groups, those who developed AKI in the postoperative period and those who did not develop AKI. KDIGO Clinical Practice Guideline for Acute Kidney Injury classification was used to characterize AKI. The preoperative variables analysed were anthropometric data, cardiovascular risk factors and blood parameters. The type of surgery, intraoperative variables related

to CPB and postoperative creatinine variation were also analysed. The association between variables was studied using binary logistic regression.

## RESULTS

Of the 329 patients included, 62 (18.8%), developed AKI. There were statistically significant differences between the groups in age ( $p < 0.001$ ), CPB time ( $p = 0.011$ ), diuresis during CPB ( $p = 0.038$ ) and mannitol and furosemide administration during CPB (respectively,  $p = 0.032$  and  $p = 0.013$ ). Odds ratio showed a significant positive association between AKI and age (OR (95%)-1.08 (1.04-1.11)), CPB time (OR (95%)-1.01 (1.00-1.01)), mannitol and furosemide administration during CPB (respectively, OR (95%)-2.29 (1.08-4.89) and OR (95%)-2.54 (1.21-5.30)).

## CONCLUSIONS

This study shows that a significant number of patients developed AKI in the postoperative period of cardiac surgery and this incidence was influenced by factors related to CPB.

# ESIMPLIFIED TECHNIQUE FOR AORTIC ARCH REPLACEMENT IN PATIENTS AT HIGH RISK FOR FROZEN ELEPHANT TRUNK

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## INTRODUCTION

Surgical approach of multisegmental pathology of the thoracic aorta, namely aortic arch / descending aorta is challenging. The Frozen Elephant Trunk (FET) has good results, with acceptable risk. However, in the subgroup of patients (pts) older than 75 years and with important comorbidities, the surgical risk is very high. Objectives: Review short-term results of this original, simplified and potentially hybrid technique developed in our Department for this subgroup of patients.

## METHODS

From January 2016 to September 2017, 10 pts were operated with this technique - mean age  $70.2 \pm 15.3$  years, 7 males. The diagnoses were: 6 pts with aneurysmal disease and 4 pts with aortic dissection. Four pts had previous cardiac surgery. The surgical concept consists of 3 key points: 1) Use of a patient-tailored graft, built in a back-table, to replace the ascending aorta and arch, with side-branches proximally anastomosed to reroute the supra-aortic vessels, allowing a proximal, long Landing Zone for eventual TEVAR. 2) Debranching of the supra-aortic vessels. 3) Maintain bilateral antero-grade selective cerebral perfusion. All pts were operated on cardiopulmonary bypass (CPB) with a period of hypothermic (24°C) cardiocirculatory arrest for the open distal anastomosis. Preservation of the left subclavian artery depended on paraplegia risk and was individually assessed

preoperatively. In a second stage, a TEVAR was electively deployed in 2 patients. All patients were followed in our clinic and imaging clinic at 6 months and annually after surgery.

## RESULTS

Mean CPB, aortic cross clamping and visceral ischemia were, respectively, 196, 120 and 44 minutes. One pt died in-hospital due to bowel ischemia. Four pts had respiratory complications requiring prolonged ventilation. The mean ICU and hospital stay was, respectively, 7,8 and 23,6 days. The mean follow-up was 15.2 months and three pts died during this follow-up. One pt was re-hospitalized with deep sternal wound infection. Of the survivors, one had a stroke at 6 months postoperatively and the remainder are asymptomatic. The postoperative period of the 2 pts submitted to TEVAR was uneventful; to date, they remain surgically stable, without needing re-intervention.

## CONCLUSION

The technique is effective and avoids the burden of FET. The short-term results are encouraging but, in the long-term, they should be evaluated to determine their role among arch interventions, specially their value in relation to recent pure endovascular techniques with fenestrated or branched endoprosthesis. Long ICU and hospital stay points towards the implementation of measures and protocols to improve them.

# ROSS SURGERY: OUR EXPERIENCE

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## INTRODUCTION

At Santa Marta Hospital, Ross Surgery was performed for the first time in 1999. Seventeen years later, it is mandatory to evaluate the mid and long-term results of our experience, as well as prospect the future of this procedure.

## METHODS

Between March 1999 and June 2016, 23 Ross procedures were performed at our institution. We did a retrospective analysis of the patient's data, results of the surgery, complications, freedom from reoperation and mortality.

## RESULTS

The majority (36,4%) of the patients had aortic

stenosis, 22,7% had aortic regurgitation and 27,3% had aortic stenosis and regurgitation. Sub-valvular stenosis was present in 13,6% of patients. The mean follow-up is 12 years. Eighty percent (n=16) of the survivors are in class I of NYHA, with the remaining 20% (n=4) in class II. In our series, 81% of the patients are free from reoperation. The overall cumulative mortality was 9%. There was no operative mortality.

## CONCLUSION

Ross surgery has specific indications and in this group of patients the advantages are undeniable and the results, according to our series are positive and encouraging.

# TRIFECTA BIOPROTHESIS FOR AORTIC VALVE REPLACEMENT: OUR EXPERIENCE

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## INTRODUCTION

Bioprosthesis are increasingly used for aortic valve replacement (AVR), as a result of increasing elderly patients, as well as, continuous improvements in durability and hemodynamic performance of pericardial prosthesis. The Trifecta aortic prosthesis is a latest-generation trileaflet stented pericardial valve designed for supra-annular placement in the aortic position. This study establishes the safety and early clinical and hemodynamic performance of the Trifecta valve.

## METHODS

We retrospectively analyzed the data of 373 consecutive patients that underwent surgical implantation of the pericardial stented aortic prosthesis (Trifecta valve; St Jude Medical, St Paul, Minn) at our institution from March 2014 (first implant) to March 2017 (3 years). Pre-operative, operative and post-operative parameters and clinical outcomes, as well as, echocardiography data were evaluated.

## RESULTS

The mean age was 73,96 years  $\pm$  51, 176 (47,18%) patients were male, mean body mass index of 28,14  $\pm$  12 and 75 (20,11%) were 380-years old. Concomitant procedures were performed in 123 (32,98%) patients. Isolated AVR was undertaken through conventional sternotomy (62,5%), partial sternotomy (35%) or anterior right minithoracotomy (2,5%). Prosthesis sizes implanted were: 19 mm (n=37), 21 mm (n=138), 23 mm (n=196) and

25 mm (n=2). The overall follow-up included 669 late patient-years. Early ( $\leq$  30 day) mortality occurred in 20 patients (5.36%), and there were 4 (1.07%) late ( $\geq$  31 days) deaths yielding a linearized mortality rate of 2.98% per late patient-year. For isolated AVR, mortality occurred in 12 (3.22%) patients. The incidence of new onset atrial fibrillation/flutter was of 28.95% (n=108). Five patients had necessity for implantation of postoperative permanent pacemaker (1,34%), and four mediastinitis/sternal dehiscence (1.07%) and thirty nine cases of major bleeding required surgery (10.46%). There were 2 early thromboembolic events, including 1 (0,27%) stroke and 1 (0,27%) systemic embolic event. There were no instances of early valve thrombosis, endocarditis, or clinically significant haemolysis. There were no late thromboembolic events or valve structural deterioration. In total, there was 1 late valve explant due to an endocarditis. Overall, freedom from valve explant was 99,77% per late patient-year. At postoperative echocardiography, average mean gradients across all valve sizes was 10.63mmHg. Mean follow-up was 4 $\pm$  2 months. No severe aortic regurgitation was observed.

## CONCLUSION

The present systematic review demonstrated that AVR with this prosthesis provided excellent early safety and hemodynamic outcomes with acceptable mean gradients; nevertheless, their timing, pathological characteristics, and clinical presentation mandate continued follow-up.



# CORONARY ALLOGRAFT VASCULOPATHY AFTER CARDIAC TRANSPLANTATION: PREVALENCE, PROGNOSTIC AND RISK FACTORS

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## INTRODUCTION

Coronary allograft vasculopathy (CAV) is still a serious long-term complication after cardiac transplantation. Purpose: To evaluate the prevalence of CAV in a single institution, its impact on survival and to explore associated risk factors.

## METHODS

From November-2003 through June-2016, 316 patients were submitted to cardiac transplantation. After excluding those with paediatric age (n=8), those with previous renal or hepatic transplantation (n=2) and those who didn't survive the first year after cardiac transplantation (n=40), the study population resulted in 266 patients. Forty two patients (15.8%) with CAV, diagnosed by a new >50% coronary artery stenosis in any vessel during follow-up, were compared with a non-CAV group.

## RESULTS

Both groups share the same median age (54+10years). Recipient male sex predominated in the

CAV group (93% vs. 74%), as did ischemic etiology (52% vs. 37%). Although not reaching statistical significance, CAV patients also had more dyslipidemia (60% vs. 50%), history of smoking (52% vs. 44%) and peripheral vascular disease (45% vs. 29%). The incidence of cellular acute rejection 1R is more frequent in CAV group (69% vs. 60%) such as 2R or 3R (29% vs. 27%). Prolonged use of inotropic support and mechanical assistance after cardiac transplantation were comparable between both groups. The survival of these patients, who were submitted to cardiac transplantation and had lived at least 1 year, between CAV and non-CAV group was comparable at 5-year (91% vs. 85%), but tended to be lower for CAV patients in 10-year interval (52% vs. 73%).

## CONCLUSION

This data confirms CAV as a common long-term complication following cardiac transplantation. Although short to mid-term survival seems not to be affected by CAV, long-term survival appears lower, hence a longer follow-up is needed.

ASCENDING AORTA  
ANEURYSMS IN  
OCTOGENARIANSJorge Pinheiro Santos<sup>1</sup>; Álvaro Laranjeira<sup>1</sup>; António Cruz Tomás<sup>1</sup>; Daniela Varela-Afonso<sup>1</sup>; José Fragata<sup>1</sup><sup>1</sup> Hospital de Santa Marta, Centro Hospitalar de Lisboa Central**INTRODUCTION**

Older age is often regarded as a relative contraindication for open surgery for aortic aneurysms. These individuals often have a greater comorbidity burden that predispose them for development of postoperative complications.

The aim of our study is to evaluate the surgical outcomes of selected octogenarians after open aortic surgery.

**METHODS**

We performed a retrospective observational study. We collected data from patients operated on by our team between January of 2012 to September of 2017. We performed univariate logistic regression and survival analysis to construct Kaplan Meier survival curves.

**RESULTS**

We analysed data from 430 patients, and 31 patients fulfilled the inclusion criteria. 67.7% of the patients were male. The mean age was  $81.5 \pm 1.8$  years. The preoperative comorbidities were hypertension (83.9%), aortic valve disease (54.8%), dyslipidaemia (48.4%), renal impairment

(9.7%), type 2 diabetes mellitus (9.7%) and COPD (3.2%). As for the procedures performed the majority was aortic valve replacement and graft interposition (48.4%) followed by graft interposition (35.5%), ascending aorta and arch replacement (9.7%) and graft interposition and combined CABG (6.5%). 16.1% of the procedures were reoperations and 6.5% were performed as urgent. In-hospital mortality was 9.4% and 1-year survival was 77.4%. The mean survival time after surgery was  $736.4 \pm 530.3$  days. As for complications, 22.6% developed respiratory complications, 6.5% had infectious complications and 3.2 developed renal and central nervous system complications. Older age was not related to early ( $p = 0.266$ ) or late mortality ( $p = 0.779$ ). There was no association between older age and longer ICU stay ( $p = 0.781$ ) or total hospital stay ( $p = 0.985$ ).

**CONCLUSIONS**

Highly selected octogenarians benefit from surgery, having a similar rate of postoperative complications and survival, as described in the literature.

# DIAGNOSTIC CHALLENGES IN CHRONIC CONSTRICTIVE PERICARDITIS

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## INTRODUCTION

Chronic constrictive pericarditis (CCP) is a disease that has multiple possible causes and is associated with variable clinical findings, depending on its severity. It develops insidiously, and in many cases, particularly in developed countries, no antecedent diagnosis can be found. These cases are termed idiopathic. Tuberculosis is the leading cause of constrictive pericarditis in developing nations but represents only a small minority in developed countries.

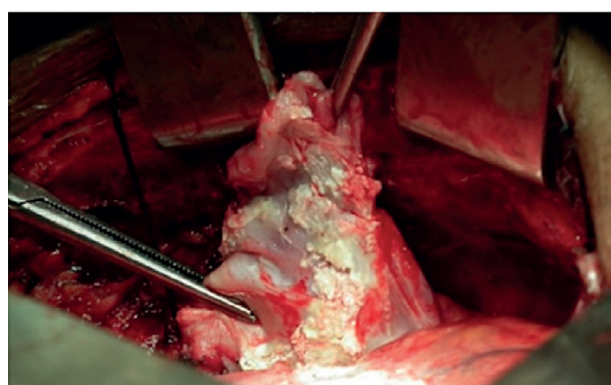
## METHODS

Here the authors describe two different case reports where tuberculosis was the probable cause of CCP.

## RESULTS

A 21-year-old man born in Cape Verde living in Europe for 4 years and a 24-year-old man born in Guiné Bissau were both admitted due to intense precordial pain and syncope after exertion. Interestingly both had fatigability, dyspnea, chest discomfort and palpitations on exertion, as well as progressive involuntary weight loss and decubitus cough. On physical examination they had tachycardia, jaundice, cachexia, elevated jugular venous pressure, hepatomegaly and ascites. Both electrocardiograms showed prominent P waves and chest X-ray showed bilateral pulmonary interstitial infiltrates and enlargement of the right cavities. Analytically, elevated bilirubin, leukopenia and thrombocytopenia was also found in both. Echocardiography revealed findings, in both cases, compatible with CCP including less common signs as annulus reversus and annulus paradoxus. Thoraco-abdomino-pelvic CT from both patients revealed chronic liver disease with congestion, pleural effusion, pericardial calcifications, ascites and massive mediastinal

and abdominal adenopathies. Blood cultures and IGRA test were negative. However, given the presumptive diagnosis of tuberculosis (TB), anti-TB therapy was started. Despite the diagnosis of "end-stage" CCP with very high operative risk multidisciplinary team decided after informed consent, to perform total anterior pericardiectomy, that occurred without complications. Pericardial and mediastinal biopsies, pericardial/pleural fluid cultures/immune-phenotyping were inconclusive. Anti-tuberculosis therapy was maintained. After surgery, the patients had a remarkable clinical improvement (NYHA I) that persisted in 6-month follow-up.



## CONCLUSION

These two case reports illustrate that despite the markedly elevated operative risk of pericardiectomy in "end-stage" forms of disease after patients informed consent must be a considered option. The other point to consider is that, despite rare, tuberculosis still is a possible diagnosis to consider in CCP in Portugal.

# CARDIAC FIBROELASTOMA: 10-YEAR EXPERIENCE

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## INTRODUCTION

Papillary fibroelastoma is one of the most common types of primary cardiac tumour. Though a rare pathology, its importance relates to its form of presentation, with stroke and sudden death, and the questions regarding its management.

## OBJECTIVES

To review the casuistic of cardiac tumours in our service, in special the papillary fibroelastomas.

## METHODS

clinical case series overviewing the period from 1st January 2008 to 30th September 2017. We analysed all patients submitted to cardiac surgery due to cardiac masses or tumours and verified all the pathology results to confirm the diagnosis.

## RESULTS

In the period selected, around 6500 surgeries were performed. Of those, 59 patients were operated on due to cardiac tumours. 81.4% were myxomas, 13.6% were papillary fibroelastomas, 3.4% were cardiac sarcomas and 1.7% were metastasis. Of the patients that had papillary fibroelastomas (n=8), 5 were male, and the mean age was  $51.5 \pm 16.2$  years. 62.5% (n=5) had origin in the aortic valve and 37.5% (n=3) in the mitral valve. Regarding presentation, 3 patients presented with stroke, 2 patients had episodes of syncope and 3 patients were asymptomatic. After surgery, all patients remained asymptomatic and there was no evidence of recurrence. At the end of follow-up all patients were alive.

## CONCLUSION

Although a rare pathology, papillary fibroelastomas remain important due to their potential for embolization and cardiac chamber obstruction, therefore should be primarily treated with surgery.

# IGG4 DISEASE AND SCLEROSING AORTITIS

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## INTRODUCTION

IgG4-related disease (IgG4-RD) is an immune-mediated fibro-inflammatory condition with unknown etiology that can affect various organs. Although its prevalence is still unknown, it appears to be more frequent in adult males. Cardiovascular manifestations are rare and can include idiopathic retroperitoneal periaortic fibrosis, inflammatory aortic aneurism, inflammatory periarteritis and inflammatory pericarditis. Vascular involvement is a well-recognized feature and large vessel commitment, especially the aorta, can be the only manifestation of the disease. The gold standard diagnosis is histological.

## METHODS

A 47-year-old man presented rupture of two aortic aneurysms: one thoracic and one abdominal, and underwent surgical correction. A segment of the aorta artery wall measuring 3x2x0.5cm, exhibited smooth intima and white vinous adventitia, medium tunic was white, through firm tissue with loss of elasticity.

## RESULTS

In addition to heterogenous collagenation with destruction of the elastic network of the aortic mediae tunica, there was fibrin deposition and neutrophil overlap. Lymphoid follicles with reactive germinate centers were along the tunica media and adventitia, without phenotype of endothelitis and absence of either macrophages and Langerhans cells (CD1a). Plasmocytes showed immunopositivity to IgG4, with heterogeneous and well defined localization, supporting the diagnosis of IgG4 Disease. Serological studies showed negativity for vasculitis, hereditary connective tissue diseases were not component of the clinical set and normal serum IgG4 concentration was determined.

## CONCLUSION

Few cases of involvement of large vessels by IgG4-RD have been reported in literature. Serum IgG4 concentration may be normal in one third of patients. In this case, IgG4 immunostaining was crucial for the diagnosis of IgG4-RD aortitis, together with the hyaline destruction of the tunica media (ESP 2015 / Aagaimy 2013). There is still no clinical knowledge for the treatment and monitoring of the involvement of large vessels by IgG4-RD.

ASCENDING AORTA  
ANEURYSMS OVER 70 MMJorge Pinheiro Santos<sup>1</sup>; Álvaro Laranjeira<sup>1</sup>; António Cruz Tomás<sup>1</sup>; Daniela Varela-Afonso<sup>1</sup>; José Fragata<sup>1</sup><sup>1</sup> Hospital de Santa Marta, Centro Hospitalar de Lisboa Central**INTRODUCTION**

Current guidelines suggest that patients with aortic diameter over 55-60 mm should undergo ascending aorta replacement, depending on associated valve pathology and other comorbidities. Studies show that the risk of aortic rupture over 60 mm is over 30%. Even though, we still receive in our practice patients that present with aneurysms of greater dimensions. The aim of our study is to evaluate the surgical outcomes of patients presenting with ascending aorta with diameter larger than 70 mm.

**METHODS**

We performed a retrospective observational study. We collected data from patients operated on by our team between January of 2012 to September of 2017. We performed univariate logistic regression and survival analysis to construct Kaplan Meier survival curves.

**RESULTS**

We analysed data from 430 patients, and 31 patients fulfilled the inclusion criteria. 64.5% of the patients were male. The mean age was  $67.9 \pm 12.9$  years. The preoperative comorbidities were hypertension (64.5%),

dyslipidaemia (45.2%), aortic valve disease (35.4%), renal impairment (9.7%) and COPD (3.2%). The average diameter was  $82.3 \pm 18.6$  mm, with values ranging from 70 to 160 millimeters. As for the procedures performed the majority was interposition of prosthetic graft (45.2%), followed by aortic valve replacement and graft interposition (35.5%), Frozen Elephant Trunk (12.9%), tube interposition and combined CABG (3.2%) and aortic root replacement with graft interposition (3.2%). 9.7% of the procedures were reoperations and 9.7% were performed as urgent. In-hospital mortality was 3.2% and 1-year survival was 83.9%. The mean survival time after surgery was  $1135.9 \pm 777.1$  days. As for complications, 29% developed respiratory complications, 9.7% had cardiac complications, 6.5% had central nervous system complications and 3.2% developed renal and vascular complications. Greater diameter was not associated with early ( $p = 0.929$ ) or late mortality ( $p = 0.987$ ).

**CONCLUSIONS**

These results show that patients with aneurysms greater than 70 mm can be safely operated on, with no increase in complications in the postoperative period or greater mortality.

# ELECTIVE 2ND STAGE TEVAR TO COMPLETE FROZEN ELEPHANT TRUNK IN THE SURGICAL CORRECTION OF COMPLEX MULTISEGMENTAL PATHOLOGY OF THE THORACIC AORTA

Álvaro Laranjeira Santos<sup>1</sup>; António Cruz Tomás<sup>1</sup>; Daniela Varela-Afonso<sup>1</sup>; Jorge Pinheiro Santos<sup>1</sup>; José Fragata<sup>1</sup>

<sup>1</sup> Hospital de Santa Marta

## INTRODUCTION

Classical conventional surgery to treat multi-segmental thoracic aortic disease in two operative stages, sternotomy and left thoracotomy, is associated with significant mortality and complications. The Frozen Elephant Trunk (FET) associated with an endovascular procedure (TEVAR) allows an extensible and simplified surgical approach of the descending and thoracoabdominal aorta without increasing the risk.

## METHODS

Retrospective study of 8 patients (pts), 5 males, mean age  $67.5 \pm 4.2$  years, with ascending and arch disease associated with descending aortic disease (chronic dissection 2 pts, aneurysmal disease 6 pts), treated between January 2014 and September 2017. All survivors are periodically followed up in our outpatient clinic with CT or MRI angiography.

## RESULTS

The average follow-up period is  $18,7 \pm 12,2$  months. In the first stage (FET) - the left subclavian was conserved in

all cases. In six of these pts, after an average period of 37 days, a TEVAR was performed, to complete the exclusion of the aneurysmal sac or the false lumen in the descending aorta. In 2 pts, the interval was longer and in the same intervention, a fenestrated endoprosthesis was implanted in the abdominal aorta by the vascular team. After TEVAR, mean ICU time was 16 hours and hospitalization was 5,2 days. One pt died in the 1st month post-intervention TEVAR + EVAR fenestrated. The remaining pts are stable and asymptomatic, in Class I NYHA, without endoleaks and with the expected involution of the aneurysmal sac and positive remodeling of the aorta. There were no cases of paraplegia or other neurological complications documented.

## CONCLUSION

This strategy is safe and effective. Clinical follow-up associated with close postoperative imaging surveillance is required not only to determine the optimal interval between the two stages, which is dependent on the anatomy and underlying pathology of each patient, but also to identify possible complications. The quality of life of these pts in the medium-term is excellent.



# TAKAYASU'S AORTITIS INDUCED ASCENDING AORTA DISSECTION

Bruno Fernandes<sup>1</sup>; Joana Saraiva<sup>2</sup>; Lina Carvalho<sup>3</sup><sup>1</sup> Department of Pathological Anatomy, CHUC;<sup>2</sup> Department of Cardiothoracic Surgery, CHUC;<sup>3</sup> Institute of Pathological Anatomy and Molecular Pathology of FMUC

## INTRODUCTION

Takayasu aortitis is a well known yet rare form of large vessel vasculitis. Also known as pulseless disease, occlusive thromboaropathy, and Martorell syndrome, is a chronic inflammatory aortitis. Vessel inflammation leads to wall thickening, fibrosis, stenosis, and thrombus formation.

## METHODS

A 64-year-old woman was referred to emergency for lack of pulse in the upper and lower limbs and changes in heart rate. AngioRMN revealed dissection of the ascending aorta while in PET, intense uptake of FDG-F18 involving ascending, cross, descending thoracic and abdominal segments of the aorta, was evident urgent surgical correction occurred. An aorta ring segment with 2.5cm length, showed whitish and smooth intima, with linear transversal laceration, with regular borders. Dissection 1cm long of the medial tunica was occupied by a clot in continuity with a thrombus occupying the neofomed lumen.

## RESULTS

Microscopy examination confirmed hyalinization of the tunica media with impregnation of fibrin / thrombus with blood cell elements. Endothelial inflammatory characteristics together with vasa vasorum and vascular trajectory of the periphery of the tunica media with inflammatory cells involvement allowed the diagnosis of Takayasu aortitis.

## CONCLUSION

Takayasu aortitis is rare in the presented age group, with early non-specific symptoms. The diagnosis of aortic dissection was crucial, constituting a medical emergency. Heather L-Gomik (2008) supports the hyaline structural alteration of the tunica media. The disease has been recognized for more than 100 years, and patients with Takayasu aortitis remain relatively poor and treatment is suboptimal. Key areas for improvement include the need for increase disease awareness and earlier diagnosis, and improved means for monitoring disease activity. The demonstration of differential expression of Toll-like receptors in arteries, is particularly intriguing and worthy of further investigation.

SYPHILITIC AORTITIS  
DIAGNOSIS IN CLINICAL  
SETTINGBruno Fernandes<sup>1</sup>; Arsénio Santos<sup>2</sup>; Lina Carvalho<sup>3</sup><sup>1</sup> Department of Pathological Anatomy, CHUC;<sup>2</sup> Department of Cardiothoracic Surgery, CHUC;<sup>3</sup> Institute of Pathological Anatomy and Molecular Pathology of FMUC**INTRODUCTION**

Cardiovascular syphilis can manifest as aortic aneurysms, aortic regurgitation and coronary ostial stenosis. Tertiary syphilis was the most common reported cause of thoracic aortic aneurysm in the pre-antibiotic era, contributing to 5- 10% of cardiovascular deaths. However, in the 21st century, it has virtually disappeared from the developing nations. Tertiary syphilis may develop in about one third of cases of untreated syphilis. In the pre-penicillin era, it was calculated that cardiovascular syphilis was responsible for 10-15% of clinical syphilis.

**METHODS**

We present a rare case of syphilitic aortitis in an era of highly effective antibiotics.

**RESULTS**

A 48-year-old man with no known clinical cardiac pathology went to emergency with an episode of chest pain of short duration and great intensity, being hospitalized with a differential diagnosis of coronary disease,

ascending aortic aneurysm and aortic valve regurgitation. Two segments of the aorta, 5cm and 9.5cm length were observed, both had thickened wall (1cm), and firm plaques with different shapes and sizes. The intima of the aorta appeared rough and pitted, with the appearance of tree bark. There were heterogeneous lesions of the tunica media: hyalinization and calcification, macrophages aggregates, areas of hemorrhage and lymphoplasmacytic infiltrate forming vascular sheaths. Adventitia exhibited hyperplasia of nerve pathways with surrounding lymphoplasmacytic infiltrate. The diagnosis of syphilitic aortitis was proposed and serological analysis revealed positivity for *Treponema pallidum*. Patient underwent surgical correction of an aortic aneurysm.

**CONCLUSION**

The serological positivity for *Treponema pallidum* and the histopathological study allowed the currently rare diagnosis of Ascending Aortic Aneurysm by Tertiary Syphilis. In the present scenario with early and widespread use of antibiotics, it is considered a very rare disease.

# TRAUMA: AN UNUSUAL CAUSE OF ENDOCARDITIS

Ana Braga<sup>1</sup>; Marta Marques<sup>1</sup>; Miguel Abecasis<sup>1</sup>; José Pedro Neves<sup>1</sup><sup>1</sup> Hospital de Santa Cruz

## INTRODUCTION

Infective endocarditis (IE) remains a dangerous condition with considerable associated mortality. Usual risk factors for IE include the presence of a prosthetic heart valve, structural or congenital heart disease, intravenous drug use, and a recent history of invasive procedures.

## METHODS

The authors describe the case report of a patient with IE having trauma as an unusual risk factor.

## RESULTS

A 33-year old male patient was referred to our department due to infective endocarditis. The patient had a fever of unknown origin for 15 days before going to the emergency department. After admission it was identified by transthoracic echocardiography a 14mm posterior abscess of the aortic valve provoking major aortic regurgitation with moderate LV dysfunction. After careful evaluation of the clinical history it was found that the patient had a known bicuspid aortic valve with follow-up since the age of 14. All other usual risk factors for IE were excluded, including intravenous drug use and recent history of invasive procedures. The only relevant previous event was a traumatic haemathoma in his left jaw caused by a working accident with an iron beam in a construction site as the

patient is a civil engineer. Vancomycin plus gentamicin were empirically started after blood cultures taken. The isolated infective agent was *Staphylococcus lugdunensis* methicillin sensitive and the antibiotherapy was de-escalated to flucloxacilin plus gentamicin. Due to cardiac dysfunction the patient was submitted to cardiac surgery on the fourth day of directed antibiotic therapy and a replacement of the aortic valve by a mechanical prosthetic valve and closure of the abscess with bovine pericardial patch was performed. The valve sent to microbiology evaluation showed the same infective provocative agent. The patient had a good clinical and laboratorial recovery completing the 42-day antibiotic scheme. After antibiotherapy period completion, echocardiography was repeated and the abscess found was larger than the previous one, presenting itself like an aortic pseudo aneurysm. The patient was resubmitted to surgery with re-closure of the initial abscess with autologous pericardial patch and replacement of the prosthetic mechanical valve for an undersized one. The patient was discharged clinically well, having a complete normal life at the moment.

## CONCLUSION

This clinical case illustrates trauma as an unusual cause of endocarditis and emphasizes the importance of a detailed clinical history.

# PREDICTORS OF PROGNOSIS IN PATIENTS WITH TYPE B AORTIC DISSECTION

Marina Dias-Neto<sup>2</sup>; Filipa Poleri<sup>1</sup>; Sérgio Sampaio<sup>2</sup><sup>1</sup> Faculdade de Medicina do Porto;<sup>2</sup> Departamento de Angiologia e Cirurgia Vascular, Centro Hospitalar de São João

## INTRODUCTION

Type B aortic dissection (TBAD) affects mostly men with an estimated annual incidence between 2.9 and 4.0 per 100,000, and it appears to be increasing. DISSECT classification was published in 2013 aiming to reunite clinical and anatomical characteristics of interest to clinicians involved in TBAD management. In Portugal, the incidence of the condition, as well as its characteristics and outcomes, are not well documented. The aim of this paper is to describe the reality of a tertiary institution with a referral area of about 0,6 million habitants.

## METHODS

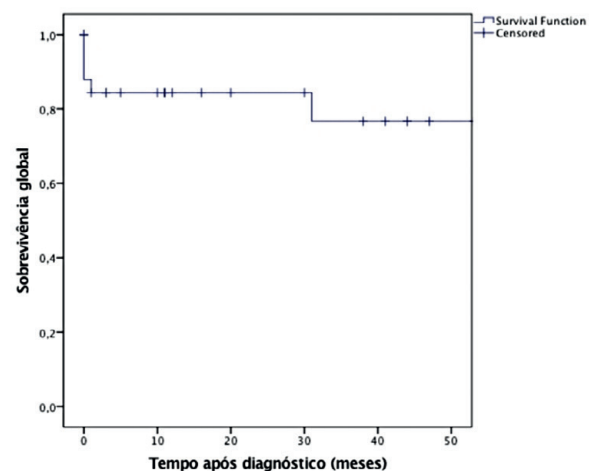
It is a retrospective study that included all patients with TBAD admitted from March of 2006 to 2016. The patients were categorized according to their demographic and clinical characteristics. For each patient, the computerized tomography scan that enable the TBAD diagnosis was classified using DISSECT classification. Overall mortality rates and aorta-related mortality rates were estimated using Kaplan-Meier method. Cox regression was used to study determinants of mortality.

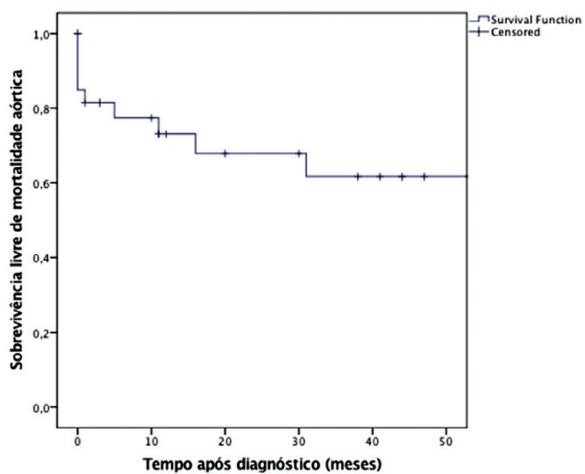
## RESULTS

We included 35 patients, estimating a TBAD incidence of approximately 0.6 per 100,000 person-year. The majority were men (83%) with a mean age of  $60 \pm 12$  years-old; 71% were hypertensive, 56% were ex-smokers or active smokers and 13% had diabetes.

As to DISSECT classification, 76% were acute (Duration), 66% had a primary Intimal tear location in aortic arch, the maximum trans-aortic diameter was  $44 \pm 13$ mm (Size), 60% extended from aortic arch to abdomen or iliac arteries (Segmental extent), 26% presented with Complications, being rupture and branch vessel malperfusion the most frequent, and 28% had partial Thrombosis of false lumen (versus 66% with permeability of false lumen). Eight patients underwent surgery (24%), 6 of them in acute phase and 2 of them in subacute phase.

At 12 months, overall survival of whole series was  $73,1\% \pm 8,3\%$  and survival free from aortic-related mortality was  $83 \pm 6,7\%$  (Figure 1 A and B). The presence of complications was identified as an independent risk factor of overall mortality but not to aortic-related mortality.





### CONCLUSION

The incidence of TBAD verified was lower than what has been described in literature. DISSECT classification can be easily applied to TBAD cases. The presence of complications predicts higher mortality. Further studies are needed to characterize TBAD in Portugal.

# ENDOVASCULAR TREATMENT OF CAROTID BLOWOUT SYNDROME

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## INTRODUCTION

Carotid blowout syndrome (CBS) is a life threatening complication associated with head and neck cancers (HNC) and its treatment. The mortality rate was reported to range from 3% to over 50% in the literature. Direct surgical repair of the ruptured internal carotid artery is often not technically possible due to the difficult anatomy and underlying poor co-morbid status. Endovascular techniques such as coil embolization and stent grafting offer an alternative to surgical ligation with better patient outcomes.

## METHODS

We describe the successful use of an endovascular approach in a case of emergent rupture of the common carotid artery (CCA) with massive bleeding in a patient submitted to radiotherapy for the treatment of a neck malignancy.

## RESULTS

A 75-year-old man with a squamous cell carcinoma of the esophagus having undergone chemotherapy and radiotherapy, was admitted to the emergency room with haematemesis with approximately 1 hour of evolution. An angiogram revealed, in the right common carotid artery, contrast extravasation with a possible fistula communicating to the esophagus. A self-expandable covered stent was deployed in the right common carotid artery. Successful repair of the vessel was confirmed in the control angiogram. The patient was discharged 10 days later

without neurological deficit or recurrent bleeding. Carotid blowout syndrome is one of the most complex bleeding complications that may occur in HNC patients. It is usually a life-threatening event and is accompanied with unexpectedly massive bleeding and high mortality/morbidity rates. Short and long term effects of radiation over arteries have been reported. Radiation can induce damage to the vasa vasorum of large arteries and it might lead to the rupture of arteries.

In the HNC population with previous surgery or radiotherapy, a high index of suspicion must be maintained for CBS in patients presenting with any recent history of oral bleeding or haemorrhaging from an exposed neck wound.

## CONCLUSION

Current evidence shows that there was no significant difference in technical and hemostatic outcomes between the reconstructive and deconstructive endovascular methods. Permanent vessel occlusion resulted in higher immediately cerebral ischemia and stent grafting induced the more potentially delayed complications, such as infection, rebleeding, and stent thrombosis. In the present case, the endovascular management of CBS of the common carotid artery had high technical success and allowed immediate haemostasis. It has been suggested that self-expanding stent-grafts are useful for the initial control of carotid bleeding but are associated with more delayed complications.

# ENDOVASCULAR TREATMENT OF PROPER HEPATIC ARTERY ANEURYSM – CASE REPORT

Tiago Soares<sup>1</sup>; Ricardo Castro-Ferreira<sup>1</sup>; Marina Neto<sup>1</sup>; João Rocha Neves<sup>1</sup>; José Pedro Pinto<sup>1</sup>; Joel Sousa<sup>1</sup>; Luis Gamas<sup>1</sup>; Paulo Dias<sup>1</sup>; Sérgio Sampaio<sup>1,2</sup>; José Fernando Teixeira<sup>1</sup>

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<sup>2</sup> Faculdade de Medicina da Universidade do Porto, MEDCIDES

## INTRODUCTION

Hepatic artery aneurysms (HAAs) are rare, representing about 0.1-2% of all arterial aneurysms. They are the second most common splanchnic aneurysms, after splenic artery aneurysms. They have the highest rate of rupture among all splanchnic artery aneurysms and frequently become symptomatic.

## METHODS

To present a case of a hepatic artery aneurysm treated by endovascular technique.

## RESULTS

A 65-year old man who had a medical history of hypertension, dyslipidemia and smoking, with an incidental finding on a CT imaging of a hepatic artery aneurysm

(maximum diameter 75mm) was admitted for selective arteriography and treatment. He was asymptomatic. We proceeded to aneurysm exclusion with a self-expandable covered stent (Viabahn®) 6x100mm. Final angiography revealed permeability of right hepatic artery, splenic artery and gastroduodenal artery, and no visible endoleaks. He was discharged on the 4th postoperative day, asymptomatic and without analytic changes. On a 6 months follow-up, CT-angio confirmed a fully patent stent with no visible endoleaks and complete aneurysm exclusion.

## CONCLUSION

HAAs should be diagnosed before rupture. Abdominal pain, bleeding or compression may be the first symptoms. Exclusion by endovascular techniques, namely through covered-stent use, may be a good option.



# ENDOVASCULAR TREATMENT OF A COMPLICATED TYPE B ACUTE AORTIC DISSECTION WITH 3-D ULTRASOUND CONTROL

Roger Rodrigues<sup>1</sup>; Javier Villaverde<sup>2</sup>; Jorge Noya<sup>2</sup>; Gabriel Anacleto<sup>1</sup>; Óscar Gonçalves<sup>1</sup>

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<sup>2</sup> Hospital Clínico e Universitário de Santiago de Compostela

## INTRODUCTION

Acute type B aortic dissection (ATBAD), identified within 2 weeks of symptom onset, accounts for 25%-40% of all aortic dissections. Approximately 25% of patients presenting with ATBAD are complicated at admission by malperfusion syndrome or hemodynamic instability, resulting in a high risk of early death when untreated.

## METHODS

We present a case of a patient with a complicated type B dissection treated by an endovascular technique with control of the sealing zone with transesophageal Echocardiogram (TEE) and 3-D images.

## RESULTS

A 56-year-old patient was admitted to the intensive care unit for having a type B aortic dissection complicated by persistent chest pain and uncontrolled hypertension. We perform a TEVAR (thoracic endovascular aortic repair) with a GORE® TAG® conformable thoracic stent graft with active control system to seal the primary entry tear, which covered the left subclavian artery. The origin of the left subclavian artery was covered by the stent graft and a vascular plug was put in place, to avoid endoleak. The procedure was performed with transesophageal echocardiogram with 3-D images to determine if the stent graft was in the true lumen.

## CONCLUSION

The treatment of acute, complicated type B aortic dissection has evolved in the past several years. Thoracic endovascular aortic repair when anatomy is suitable, has been regarded as the preferable treatment to seal the primary entry tear, redirect and re-establish adequate true lumen flow, and thereby promote aortic remodeling. The availability of TEVAR, albeit applied until recently as an off-label treatment, has clearly produced better results than procedures such as open surgical or endovascular fenestration. However, the results of this treatment may improve when associated with other imaging tests. The TEE has a high performance in the diagnosis of this pathology, especially in regard to the detection of the flap and the two lumens, as well as for the calculation of the size of the entrance tear. It presents an added value in the endovascular treatment, since it helps in the implantation of the devices both for the location of the true lumen, its definitive position and the result of the procedure. TEVAR is the preferred treatment for acute, complicated type B aortic dissection with improved late survival and positive aortic remodeling. The efficacy of this treatment is significantly increased in association with other imaging techniques such as transesophageal echography.

# HOSTILE THORACIC AORTIC ANEURYSM TREATED BY FENESTRATED THORACIC STENTGRAFT WITH PROXIMAL SEALING IN ISHIMARU ZONE 0

Joel Sousa<sup>1</sup>; João Neves<sup>1</sup>; Vicente Rimbau<sup>2</sup>; José Teixeira<sup>1</sup>

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<sup>2</sup> Hospital Clinic, Barcelona, Spain

## INTRODUCTION

Thoracic endovascular aortic aneurysm repair (TEVAR) is an established treatment for thoracic aortic disease in both the acute and elective setting, with such a widespread use that almost 50% of all thoracic aortic surgery in Europe is performed by these means.

Nonetheless, the feasibility of TEVAR is determined by several anatomic factors, and the suitability of the proximal and distal landing zones remain one of the main limitations to its use.

The advent of custom-made thoracic stent grafts widened the endovascular options in some challenging anatomies.

## METHODS

The authors present a case report of a descending thoracic aortic pseudo-aneurysm, with no suitable proximal landing zone, successfully treated by means of a custom-made fenestrated thoracic stent graft.

## RESULTS

Male patient, 57 years old, with multiple cardiovascular risk factors and past medical history of coronary heart disease, pulmonary emphysema and high speed trauma 20 years before. The patient was referred after being diagnosed with an asymptomatic saccular

pseudo-aneurysm of the descending thoracic aorta, with 50mm of largest diameter and located at the level of the aortic isthmus. Inadequate proximal sealing was evident, even if deliberate left subclavian and carotid coverage were performed. Due to the prohibitive open surgical risk, and taking into account the post-traumatic etiology of the lesion, an endovascular solution was planned. The patient was therefore sequentially treated by means of a left carotid-subclavian bypass followed by custom-made fenestrated TEVAR, with a single fenestration for both the left common carotid artery and brachiocephalic trunk, granting proper sealing in the distal ascending aorta (Ishimaru zone 0). Rapid pacing was used during the implantation, with heart frequency of 180 bpm and systolic pressures of 40mmHg, allowing for a more precise deployment with no windsock effect. The procedure was successful and uneventful, with no intra-operative endoleaks, birdbeaks or retrograde dissections. There are no reported complications at 6 months follow-up.

## CONCLUSION

Custom-made fenestrated thoracic stentgrafts are an accessible, reproducible and safe therapeutic option when dealing with hostile thoracic arch anatomies, and should be considered as a minimally-invasive effective solution in selected cases.

# DIGITAL SUBTRACTION ANGIOGRAPHY OR COMPUTED TOMOGRAPHY ANGIOGRAPHY IN THE PREOPERATIVE EVALUATION OF LOWER LIMB PERIPHERAL ARTERY DISEASE – A COMPARATIVE ANALYSIS

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## INTRODUCTION

For several years, digital subtraction angiography (DSA) was considered the gold standard method for the evaluation of PAD patients. This is an invasive technique and allows a good evaluation of collaterals and the vessel lumen, even in cases with associated calcification. Nevertheless, recent technical development of computed tomography angiography (CTA) has improved its specificity and sensibility, besides the fact that CTA is a fast and non-invasive procedure. Objective: To characterize a cohort of lower limb PAD patients and clarify if there are differences among the patients preoperatively evaluated by DSA or CTA.

## METHODS

This retrospective study focused on PAD patients with a Rutherford classification  $\geq 3$  and submitted to intervention (endovascular revascularization or open surgery). The CTA group included all patients submitted to this method as their preoperative exam, between March 2009 and April 2017. In the same period of time, patients submitted to DSA as their preoperative exam, were randomly selected. 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 realization of the

exam. The groups were compared upon the type of surgery (open vs endovascular), number of revascularization sectors, reintervention, amputation, mortality and length of hospital stay.

## RESULTS

34 CTA patients and 71 DSA patients were included. The groups were demographically and clinically homogeneous. In what regards to arterial lesions, the DSA group showed more often lesions of the distal sector with TASC C or D classification (25% in DSA group and 0% in CTA group;  $p=0,001$ ), as well as scarcity of runoff vessels (0 or 1 in 72% of DSA patients group and 26% in CTA group;  $p=0,001$ ). There were no differences about the endovascular and open surgery ratio (1.8 to CTA and 1.4 to DSA;  $p=0,305$ ), reintervention rates (21% CTA and 16% DSA;  $p=0,517$ ), major amputation (9% CTA and 11% DSA;  $p=1$ ), minor amputation (9% CTA and 16% DSA;  $p=0,541$ ), mortality (18% CTA and 23% DSA;  $p=0,602$ ), or length of hospital stay (median and (interquartile range) of 14 (27) for CTA and 14 (17) for DSA;  $p=0,933$ ).

## CONCLUSION

CTA seems to be a method for morphological and therapeutic planning of PAD that is non-inferior to DSA.

# DEEP VEIN THROMBOSIS AS FIRST MANIFESTATION OF HIBERNOMA – A CASE REPORT

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## INTRODUCTION

Hibernoma is a very rare benign tumor that arises from vestigial remnants of fetal brown adipose cells and usually manifests as a slowly growing, painless soft-tissue mass. It mainly occurs in adults, in the third and fourth decade of life, slightly more in women and is commonly seen in the subcutaneous regions of the back, neck, thighs and retroperitoneum. It was originally described in 1906 by Merkel, who named it "pseudolipoma". In 1914, Gery derived the name hibernoma from the tumor's histological similarity to brown fat in hibernating animals. A hibernoma may be confused with a lipoma clinically and cannot be completely distinguished from hypervascular lesions such as liposarcoma.

## METHODS

A 36-year-old woman presented with pain and edema of the left leg. It was diagnosed with non-recent femoro-popliteal venous thrombosis, was medicated with rivaroxaban and prescribed compression stocking.

## RESULTS

The edema subsided after 2 weeks but she still complained of pain in the thigh several weeks after first visit along with subtle localized soft enlargement in the upper thigh. It was requested a CT scan that showed a nodular image with

60X 47 mm medially to vastus intermedius and beneath the sartorius and rectus femoris muscles, which was suspected to be a liposarcoma. In this context, a magnetic resonance imaging was requested and showed contact with femoral vessels with no cleavage plan, suspected to be a mixoid liposarcoma. The biopsy didn't show malignancy. She was operated with local excision of the mass and preservation of adjacent structures. Pathologic evaluation revealed a hibernoma with 11.5 cm, PS100 positive and MDM2 negative. The patient was evaluated at outpatient clinic 6 months after surgery and had no evidence of relapse.

## CONCLUSION

The first clinical manifestation of this patient was a deep vein thrombosis and the diagnosis of the lipomatous tumor was delayed. Clinical awareness of less frequent causes of DVT is a key point to timely detection of this lesions that are rare and curable. The increased vascularity of this lesion raised suspicion of malignancy. Malignancy potential is perhaps the most difficult aspect to ascertain in this patient, being only completely disclosed after surgical excision. Optimal treatment is complete surgical resection. Local recurrence does not occur with complete excision. No reports of metastases of malignant transformation have been identified in the reviewed literature.

# INFRARENAL ABDOMINAL PENETRATING AORTIC ULCER, AN ATYPICAL LOCATION OF A RARE DISEASE

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## INTRODUCTION

Penetrating aortic ulcer (PAU) is classically included in acute aortic syndromes, together with aortic dissection and intramural hematoma. These three disorders are considered different stages of the same disease. PAU is the result of medial degeneration with disruption of the intima, mainly due to atherosclerotic risk factors. Most of them are located on descending thoracic aorta and only a few small series and case reports demonstrate location on infrarenal abdominal aorta. Clinical presentation varies in spectrum, from asymptomatic to fatal aortic rupture. Treatment options include medical therapy, particularly strict blood pressure control, and surgical approach. Nowadays endovascular exclusion is commonly performed, although open surgical reconstruction remains the gold standard.

## METHODS

Report a case of endovascular repair of an infrarenal abdominal PAU.

## RESULTS

A 72-year-old man, with hypertension, type 2 diabetes, hypercholesterolemia, lumbar osteoarthritis, was referred to Vascular Surgery outpatient clinic with the diagnosis of infrarenal abdominal PAU on a Computed

Tomography Angiography (CTA). This exam was performed due to chronic lumbar complaints from lumbar osteoarthritis. The patient denied any other complaint. Physical examination was normal. A thoraco-abdomino-pelvic CTA revealed two sites of PAU in the infrarenal aorta with 10mm and 21mm of depth and associated aortic enlargement of 39mm maximum diameter. This exam revealed an enlargement of the depth of the PAU and the aorta diameter in 2 and 3mm, respectively, in the course of 2 months.

An EVAR was performed, in a standard aorto-biiliac fashion. The post-operative period was uneventful and the patient discharged 3 days later. 1 month after the surgery, patient remained asymptomatic and the follow-up CTA demonstrated exclusion of both PAU, no endoleaks and stability of aortic diameter. A long term follow-up should be maintained, as for regular EVAR.

## CONCLUSION

PAU is a rare clinical entity, with infrarenal abdominal aorta location even scarcer. Asymptomatic patient must be regularly followed and threshold to treatment low, bearing in mind the possible catastrophic evolution of the disease. Endovascular approach should be considered as a first approach, considering the technical feasibility and the comorbidities associated with this elderly population.

# CREATIVE VASCULAR ACCESS CONSTRUCTION IN SAME PATIENT

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## INTRODUCTION

Creating and maintaining a functional vascular access (VA) is a critical factor in the survival of a dialysis patient. However, it will not function forever, implying a creative attitude from the vascular surgeon either to maintain its functionality or built a new one wherever possible, being it autologous or synthetic.

## METHODS

Describe the VA history of a 59years-old male with morbid obesity and end-stage chronic kidney disease.

## RESULTS

His VA construction started in 2012 with failed attempts in both forearms until a functional brachiocephalic artery-venous fistula (AVF) in the right upper limb was achieved, but was deemed to ligation as severe venous hypertension secondary to central venous disease related to CVC use. As he had no good superficial conduit in the left arm we decided to harvest the deemed right cephalic vein and implant it in the left arm, creating an autologous arteriovenous shunt between the brachial artery and axillary vein (AV). Despite initial patency, it failed irreversibly weeks after creation. As no more superficial veins were available in the upper limbs, a prosthetic access was the next step. We decided for a hybrid graft (HG) between the left brachial artery and the AV because the patient biotope and a scarred axilla impeded

a safe reintervention on the AV. This graft was being used since 2015 with multiple interventions for maintaining patency (PTA, segmental graft replacement and thrombectomies). Recently we noticed a significant diffuse prosthesis deterioration and reduced AVF flow with no possible segmental reconstruction. We were then forced to proceed with total graft substitution preserving the outflow stented segment of the HG, using an early cannulation graft (ECG) and prevent CVC use. After this successful reconstruction, the patient started hemodialysis on the following day with no interurrences registered.

## DISCUSSION

Generally, CVC's are related with poorer dialysis quality and patient survival. Hence, fighting for any other functional access is very important. The range of solutions will depend on the vascular surgeon capacities, imagination and device access. Once faced with no more feasible direct autologous access, there is a range of complex autologous fistulas, including veins translocations. When no more native vessel can be used for puncture, we still have a wide armamentarium (normal grafts, ECG or HG) that should be considered according to patient specifications. HG besides some hemodynamic advantages, can be very useful when the landing vessels are difficult to access. ECG offer the advantage of almost immediate cannulation, preventing CVC placement and its associated comorbidities.

# PERCUTANEOUS TREATMENT PSEUDO-ANEURISM OF THE HAND IN HEMOPHILIC PATIENT

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## INTRODUCTION

Pseudo aneurysms of the hand are infrequent lesions, usually associated with perforating trauma. The diagnosis is based on clinical suspicion and image confirmation of a pulsatile swelling. Various treatment modalities are currently described in the literature.

## METHODS

Presentation of a clinical case and discussion of the treatment strategy instituted.

## RESULTS

Clinical case: Man, 35 years old, with hemophilia A. History of perforating trauma of the palmar face of the right hand 3 weeks ago, having been sutured in the local hospital. Since then he notices a pulsatile swelling in the palm of the hand associated with paresthesias and decreased sensitivity in the index finger. A pseudo-aneurysm with 2x3cm was observed, partially thrombosed, and with probable origin in the palmar arch or in the common digital artery. He underwent angiography demonstrating the patency of the palmar arch but without perfusion of the pseudo-aneurysm, and the control duplex scan showed complete thrombosis of the false aneurysm. After 2 months of follow-up, the

duplex scan was repeated and repermeabilization of the pseudo-aneurysm was verified. The patient was then treated with percutaneous Doppler-guided thrombin injection. Immediate thrombosis of the lesion was found, with no evidence of ischemic complications. He remained asymptomatic under clinical surveillance.

## CONCLUSION

For small pseudo-aneurysm conservative non-interventional treatment with external compression may be effective. Conventional surgical treatment with simple ligation or arterial reconstruction may be indicated in larger pseudo-aneurysm. Recently, endovascular techniques such as coil embolization have also been described. Hemophilia A is a genetic disease of recessive hereditary transmission linked to the X chromosome, with deficiency of factor VIII of the coagulation cascade, which manifests with increased risk of hemorrhage. In this particular case, given the risk of hemorrhage, we chose minimally invasive percutaneous treatment, with clinical and imagological success and no complications. Percutaneous treatment by ecodoppler-guided injection of thrombin is an effective and safe treatment, particularly in pseudo-aneurysm associated with surgical risk factors.



# ACUTE IATROGENIC LIMB ISCHAEMIA, A REPORT OF 2 LATE PRESENTATION CASES

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## INTRODUCTION

With increasing use of percutaneous vascular procedures, access complications that present to a vascular surgeon increase. The most limb-threatening condition is acute limb ischaemia. Acute limb ischaemia is the most common vascular surgical emergency. In spite of recent advances in vascular surgery, it continues to carry a poor prognosis, if not early diagnosed and managed.

## METHODS

This is a case-report of 2 patients referenced to a vascular surgery emergency department of a tertiary hospital with late acute limb ischaemia.

## RESULTS

**Patient 1:** Male, 42 years, alcoholic, autonomous, presented with pain with elbow active movements in a secondary hospital. Excluded acute orthopaedic injury, doctor recorded signs of acute limb ischaemia and referenced patient to a tertiary hospital, where vascular surgeon diagnosed an acute advanced upper limb ischaemia. Bed-side Eco-Doppler showed an echogenic linear material on a thrombosed umeral artery, surgically confirmed to be a guidewire (Fig.1). Surgical extraction of intra-umeral guidewire). Reviewing patient history, this guidewire should have been missed over 6 months, by the time the patient was hospitalized on an ICU for alcoholic coma. Patient underwent umeral, radial and ulnar thromboembolectomy and had a no-reflow status.

**Patient 2:** Male, 56 years, autonomous, presented with cardiorespiratory arrest, responsive to advanced life care support. Patient underwent coronary catheterization with femoral access. 24 hours later, he presented to a vascular surgeon with an acute lower limb ischaemia; bed-side Eco-Doppler showed a thrombosed calcified plaque on femoral bifurcation. Patient underwent femoral thromboembolectomy and recovered a good foot perfusion.

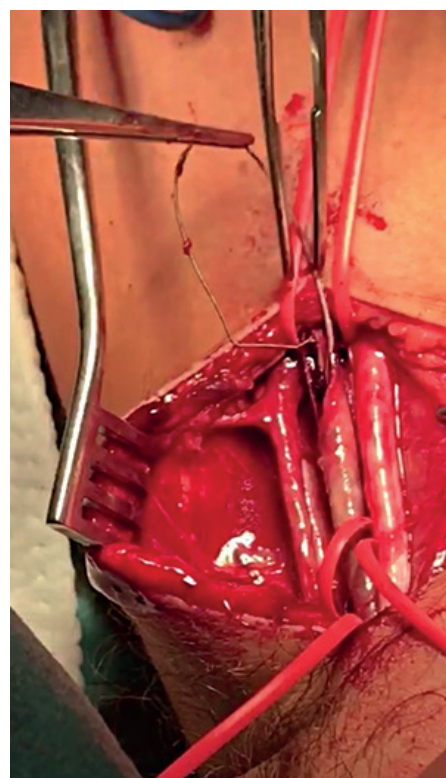


Figure 1

However, poor persistent global status, with limited mobilization, pressure forces and prolonged vasotropic support, promoted progression of a cyanotic leg plaque to a necrotic evolving leg ulcer with septic response, despite persistent good perfusion of the foot (Fig.2. Necrotic evolving leg ulcer). Unfortunately, the two reported patients underwent urgent major limb amputation, patient 1 above the elbow, and patient 2 above the knee.

#### CONCLUSION

Acute limb ischaemia continues to carry a poor limb and life prognosis if not early diagnosed. We should be alert for the increasingly prevalence of iatrogenic acute limb ischaemia, and regularly evaluate perfusion status of limbs after any percutaneous procedure.



Figure 2

DIGITAL ARTERY ANEURYSM –  
CASE REPORTJosé Vidoedo<sup>1</sup>; José Teixeira<sup>1</sup><sup>1</sup> Hospital Particular de Viana do Castelo**INTRODUCTION AND METHODS**

A 71-year-old patient, housewife, with a history of hypertension, elevated cholesterol and hypothyroidism was referred to the outpatient clinic for tumefaction of the right hand 5th finger noticed 3-4 months earlier. She denied past or recent history of trauma, cardiac or infectious disease and had no familial history of aneurysmatic disease. She was asymptomatic except for local slight discomfort when she had to press or push something with her hand. She had no sensitivity or mobility impairment. On examination a round, soft, pulsatile mass in the lateral aspect of the 5th finger was evident. All peripheral pulses were palpable with no evidence of abnormal or augmented pulsatility or thrill. Her peripheral pulses were palpable and symmetrical and didn't have augmented abdominal pulsatility. An ultrasound scan revealed a round mass measuring 14x7mm, having high intensity and pulsatile flow inside with turbulence suggesting aneurysm of or related with the proper digital artery.

**RESULTS**

She was submitted to resection of the aneurysm under digital nerve block and use of a ring tourniquet at the finger base. An oblique incision was made and under careful dissection the aneurysm was disclosed and extirped after control and ligation of the inflow and outflow vessels. Eight months after surgery the patient remained asymptomatic with no signs of local recurrence. Hystologic examination revealed a sacular aneurysmatic formation surrounded by papillary endothelial hyperplastic lesions.

**CONCLUSION**

Digital artery aneurysms are very rare and most related with occupational or sports trauma. They are recognized sometimes by causing local discomfort or neurological symptoms due to nerve compression. Most cases can be treated by straight resection after ligation of proximal and distal contiguous vessels taking care not to compromise flow to the distal finger.

# TRUE BRACHIAL ARTERY ANEURYSM AFTER ARTERIOVENOUS FISTULA FOR HEMODIALYSIS – CASE REPORT

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## INTRODUCTION

Brachial artery aneurysms are relatively uncommon and generally due to infectious, post-traumatic or iatrogenic etiology. They seem to affect 4.5% of arteriovenous fistula. The usual manifestation is an accidental finding of a pulsatile, painless, and asymptomatic mass. Complications include sac thrombosis, thromboembolic ischaemic events, and disruption with profuse bleeding.

## METHODS

The aim of this study is to present a case of true brachial artery aneurysm in end-stage renal disease patient after arteriovenous fistula creation.

## RESULTS

Sixty-six-year-old men with a past medical history of hypertension, dyslipidemia, smoking and poliquistic renal disease. He started a hemodialysis program in March 2006, using a brachiocephalic fistula on the left upper limb, built in February 2005. Submitted to kidney transplant in June

2010 and subsequent fistula ligation in December 2012. He goes to the emergency service in June 2016 with a pulsatile mass on the medial aspect of the left arm. Pain, redness and heat were present. Radial pulse was palpable. Inflammatory parameters were high and ultrasound revealed a fusiform aneurysm of the brachial artery with partial thrombosis and triphasic flow. An MRI was performed, documenting a brachial artery aneurysm, with 44mm greatest diameter and an extension of 17.5cm. Patient was hospitalized under antibiotic therapy and submitted to a reversed great saphenous vein interposition graft. Discharge from hospital occurred on the 7th postoperative day, with no sensitive or motor deficits and a present radial pulse.

## CONCLUSION

Arterial aneurysm is a rare, but significant complication long after the creation of a hemodialysis access. High flow, immunosuppression and increased resistance following ligation of the AV fistula may accelerate this process.

# FUNCTIONAL POPLITEAL ARTERY ENTRAPMENT SYNDROME

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## INTRODUCTION

Popliteal artery entrapment is an uncommon syndrome, caused by extrinsic compression of the popliteal artery by muscular or tendinous structures. It occurs mainly in young individuals, with no atherosclerotic risk factors, and a mean age of presentation of 20 to 40 years, and has higher prevalence in males (83% of patients). Clinical presentation depends on the degree of arterial lesion, the most common being intermittent claudication, with critical ischemia being frequent. Occasionally, it may present as acute ischaemia.

## METHODS

A 40-year-old female patient, physical education teacher, presented with a history of left foot paresthesia and left calf muscle pain during jogging for one year. The patient used to previously run 10 kilometers, currently mentioning claudication at 500 meters. No other medical conditions were mentioned. Lower extremity arterial duplex ultrasound revealed left popliteal artery compression and occlusion during active plantar flexion and passive dorsal flexion. The patient was referred to a vascular surgery center. Physical examination revealed palpable bilateral lower extremity pulses, with left asymmetry. Lower limb angiography and magnetic resonance imaging (MRI) were performed which demonstrated left popliteal artery compression and occlusion during a resisted plantar flexion. MRI revealed no anatomic anomalies, pointing to a probable functional entrapment caused by calf muscle hypertrophy (typo VI).

## RESULTS

Entrapment correction surgery was performed through a posterior approach and exposure. During the procedure, the artery showed no signs of significant fibrosis. Since compression by the medial head of the gastrocnemius muscle was observed, myotomy of its lateral fibers was performed. The patient was discharged on the second day post-surgery. After three months, the patient remained free of symptoms, having taken up sports practice with no limitations.

## CONCLUSION

Continuous popliteal artery compression leads to its progressive fibrosis, which may cause thrombosis or post-stenotic aneurysmal dilation. Treatment should be performed as soon as possible as to avoid this course and the eventual necessity of interposition or bypass grafting. Furthermore, late intervention worsens the interposition/bypass grafting prognosis<sup>5</sup>. In this sense, the possibility of this diagnosis should be considered in a young patient presenting with intermittent claudication. Diagnostic tests are often decisive for differential diagnosis and to establish the disease subtype and intervention strategy. In most patients, a culprit muscular or tendinous anomaly is detected before surgery, however, in some individuals, especially physically active ones, compression results from muscular hypertrophy.

# TRUE BRACHIAL ARTERY ANEURYSM IN A PATIENT WITH VASCULAR ACCESS FOR HAEMODIALYSIS AND KIDNEY GRAFT

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## INTRODUCTION

True brachial artery aneurysms are rare and some of them have been described as a late complication in patients with vascular access for haemodialysis and kidney graft. The purpose of this paper is to present a clinical case of a patient with a true brachial artery aneurysm and its following treatment.

## METHODS

This case concerns a caucasian male patient with 43 years old who had vesicoureteral reflux at 7 years old, and subsequent end-stage renal disease, and started on haemodialysis at the age of twelve. The patient had homolateral radial and brachiocephalic arteriovenous fistulas (AVF), two sequential kidney grafts and was under immunosuppressant therapy for several years. As part of the medical history he also had bilateral amaurosis, Hepatitis B and C and was submitted to total parathyroidectomy and a following auto-transplant. In the latest years the patient presented with several aneurysms related to the vascular access. After the finding of an anastomotic false aneurysm and venous aneurysms complicating the AVF, the patient had removal of the aneurysms and ligation of the AVF. Later, he was diagnosed, in different times, with two true brachial artery aneurysms. At the time of the diagnosis of the first true aneurysm, the patient presented with local pain and

occasional paraesthesias relative to compression symptoms. At physical examination the patient had a brachial pulsatile mass and a palpable radial pulse. The Doppler ultrasound exam revealed a true brachial artery aneurysm with 4,5 cm diameter. After two years, the patient was once again diagnosed with a true brachial artery aneurysm with 3,1 cm diameter. At this time the patient was asymptomatic and had palpable brachial mass and radial pulse.

## RESULTS

At the time of the diagnosis of the first true brachial aneurysm the patient was submitted to partial aneurysmectomy and brachio-brachial graft with PTFE 8. The patency of the graft persisted until the diagnosis of the second aneurysm. After two years, the patient was submitted to partial aneurysmectomy and axilobrachial graft with PTFE 8.

During the follow-up period, the patient remained asymptomatic, had palpable radial pulse and the Doppler ultrasound exam confirmed the patency of the graft.

## CONCLUSION

The surveillance of patients with long duration AVF and kidney grafts might be advantageous in the early detection of arterial aneurysms. The surgical treatment in this group of patients is a first treatment option that is associated to a low morbidity.

# HILAR RENAL ARTERY ANEURYSM – EX-VIVO RECONSTRUCTION AND AUTOTRANSPLANTATION

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## INTRODUCTION

Renal artery aneurysm (RAA) is a rare clinical entity with an estimated prevalence of 0.15% to 0.1% in the general population. The majority of patients present asymptotically and the diagnosis is made incidentally during a hypertension study test, and more rarely, fortuitously after backache. Indications to treat have been subject of intense debate, nevertheless there seems to be some consensus that RAAs greater than 2 cm in diameter, expanding RAA, with thrombus or in pregnant women should be treated. Treatment options vary between surgical or endovascular approach. The complex (hilar) RAA constitute a subset of RAA that present a therapeutic dilemma because of their anatomic location and may require extracorporeal arterial reconstruction and auto-transplantation.

## METHODS

We describe a 71-year-old woman with a personal history of hypertension for more than twenty years but normal renal function. Following the study for an abdominal discomfort a complex RAA was incidentally diagnosed. Computed tomographic angiography with three-dimensional reconstruction revealed a 13mm, saccular aneurysm located at the right renal hilum.

## RESULTS

We performed hand-assisted laparoscopic nephrectomy with ex vivo repair of the RAA. The aneurysm was resected and a polar renal artery was implanted over the resected area with a latero-terminal anastomosis. Complementarily, the renal vein was augmented with a spiral great saphenous vein graft and finally the kidney was implanted into the right iliac fossa. The intervention and postoperative course were uneventful and the patient submitted to ultrasound evaluation on the day after procedure. It revealed normal renal perfusion with normal flow indices. In the last follow-up realized, two months after surgery the patient was alive with a well-functioning auto-transplant.

## CONCLUSION

RAA may be nowadays more frequently diagnosed due to the increasing use of imaging techniques. While renal artery trunk aneurysms are most often treated using an endovascular procedure it is not suitable for renal artery branch aneurysms. Hand-assisted laparoscopic nephrectomy with ex vivo repair and auto-transplantation is a challenging but feasible option for treating hilum RAA.



# ANTIPHOSPHOLIPID SYNDROME AND ACUTE POSTPARTUM LIMB ISCHEMIA

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## INTRODUCTION

The diagnosis of Antiphospholipid syndrome (APS) implies the identification of antiphospholipid antibodies and arterial/venous thrombosis or pregnancy loss. During pregnancy, there is an increased risk of thrombotic complications.

## METHODS

Present a case of acute lower limb ischemia in a patient with APS during postpartum period Materials/Methods: review of a clinical case and available literature

## RESULTS

Patient diagnosed with APS (triple antibody positive and antecedent of 3 previous abortions) underwent cesarean at 29 weeks of gestation. She was medicated with aspirin 00mg/day and enoxaparin 60mg/day and had discharge on the second postoperative day. After 3 days she came to the emergency department with acute limb ischemia. AngioCT revealed thrombosis of the right iliac axis and pulmonary thromboembolism. Endovenous hypo-coagulation with unfractionated heparin was immediately started. Due to the high thrombotic risk associated with any type of surgical intervention and improvement of ischemia with hypocoagulation, it was decided to postpone surgical revascularization. At the 10th day of hospitalization angioCT was repeated with maintenance of the iliac thrombosis and clinically the patient had severe claudication and

ankle-arm index of 0.26. On the 16th day of hospitalization (after 5 plasmapheresis sessions), she was submitted to trans-femoral thrombectomy, with a good femoral pulse at the end of the procedure. On the 3rd postoperative day we detected pulse loss and angioCT confirmed re-thrombosis of the iliac axis and an occlusion of the popliteal artery. A new attempt at revascularization was made and a new transfemoral thrombectomy was performed, with immediate pulse recovery. We performed intraoperative angiography that confirmed occlusion of the popliteal artery and we proceeded trans-popliteal thrombectomy. Intraoperative control angiography revealed permeability of ilio-femoro-popliteal axes with some defects of filling of the crural arteries (anterior tibial and peroneal arteries). After the procedure the patient become asymptomatic, with an ankle-arm index of 0.55 (with normal flow in femoral and popliteal artery but monophasic flow in distal arteries) and had discharged medicated with aspirin, antivitaminik K and corticoid.

## CONCLUSION

The beneficial/risk of revascularization surgery should be well considered as well as the timing in which it should be performed. Plasmapheresis is important to minimize the thrombotic risk associated with the surgical procedure. Intra-operative angiography is essential since arterial thrombosis can occur in several sectors, which can conditionate the success of revascularization procedure.

# CO-EXISTENCE OF ABDOMINAL AORTIC ANEURYSM WITH UROLOGIC NEOPLASM: WHICH SHOULD BE TREATED FIRST IN THE ENDOVASCULAR ERA?

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## INTRODUCTION

Prevalence of Abdominal Aortic Aneurysm (AAA) with concomitant malignancy rounds 3-13%. Considering only urological neoplasms the prevalence is around 3.6%. Survival at 5 years of bladder carcinoma without extravascular invasion (stage II) rounds 63%. Endovascular Aneurysm Repair (EVAR), due to its minimally invasive profile, is an option for treatment of AAA prior to urological surgery as it does not require laparotomy not conditioning the delay of oncologic surgery.

## METHODS

Male, 62 years old. History of smoking and coronary artery disease and urothelial carcinoma of the bladder (T2N0M0). In the abdominal CT scan used for neoplasm staging a para-renal AAA with 50 mm of maximum diameter was firstly detected. This aneurysm presented only 5 mm of proximal neck length, insufficient for a safe proximal sealing with standard endografts. In consequence the treatment of choice was a tetra-fenestrated endograft (F-EVAR).

## RESULTS

F-EVAR occurred without complications: no endoleaks, access complications or branch thrombosis. Three months after F-EVAR, the patient underwent radical cystectomy with jejunocystoplasty, which also occurred without interurrences. Two days after FEVAR patient was discharged home. After one year of follow-up, abdominal CT scan

did not reveal any complications related to the endovascular procedure. The patient died 18 months after the intervention as a consequence of metastatic evolution of bladder primary neoplasm.

## CONCLUSION

The coexistence of AAA with neoplastic urologic pathology although rare is not negligible. In the above case, the patient presented AAA with about 5 cm (1-11% risk of rupture per year), associated with T2N0M0 bladder urothelial carcinoma (survival at around 63% at 5 years). Given the need for treatment of both pathologies, the doubt persisted about which procedure should be performed first: aneurysm repair or cystectomy. Prior to the advent of EVAR, AAA repair would require laparotomy with a potentially greater risk of complications in the subsequent urologic procedure, prosthesis infection and significant delay of the cystectomy. With the emergence of endovascular techniques, AAA repair occurs without conditioning postponement or significant complications during a subsequent urological procedure and then "EVAR first" was the decision. Two days after FEVAR patient was discharged home and three months later cystectomy was performed also without complications. In conclusion: in case of concomitant AAA and abdominal malignancy balance between risk of rupture and progression of the neoplastic disease need to be weighted. With the advent of endovascular disease EVAR prior to the oncologic surgery represents an efficient, prompt and safe solution.

# SURGICAL THROMBECTOMY, FIBRINOLYSIS, ANGIOPLASTY AND STENTING: A COMBINED APPROACH FOR TREATMENT OF A MAY-THURNER SYNDROME PRESENTING AS PHLEGMASIA CERULEA DOLENS

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## INTRODUCTION

Phlegmasia cerulea dolens (PCD) is a rare complication of deep venous thrombosis (DVT). Massive ileo-femoral DVT is usually the cause and prompt treatment is mandatory as it represents a medical emergency. Reported amputation rates range from 12% to 25% and mortality ranges from 25% to 40%. Limb ischemia results from obstruction to arterial inflow secondary to extreme levels of venous hypertension. Primary treatment goal is restoration of venous outflow and can be achieved by endovascular or surgical techniques. After thrombus removal an underlying iliac vein stenosis may be present. May-Thurner syndrome, a condition where the left common iliac vein is compressed by the right iliac artery, is the most prevalent iliac stenotic lesion.

## METHODS

We report a case of a 57 years-old male, smoker, with no significant medical history, who presented to the emergency department with excruciating sudden left limb pain and swelling, with no trauma history, with a 2-hour onset. On physical examination he showed significant edema, purplish discoloration of the entire leg and absent dorsalis pedis artery pulse.

## RESULTS

Hipocoagulation with intravenous heparin was immediately initiated and emergent surgical venous thrombectomy was performed associated with direct intravenous fibrinolytic agent injection. Postprocedure phlebography showed a left common iliac vein lesion which was treated with angioplasty and venous stent placement. Pain, edema and coloration improved markedly after procedure without any complications. The patient was discharged home with anticoagulation treatment and compression stocking.

## CONCLUSION

Endovascular approaches such as catheter-directed thrombolysis (CDT) or pharmacomechanical thrombolysis (PMT) are becoming the treatment of choice to achieve venous outflow in DVT. In cases of PCD, when rapid restoration of venous outflow is mandatory, CDT has the disadvantage of having a long mean treatment time. This way, surgical thrombectomy still plays an important role in cases of PCD, especially if PMT is not available. In our case, the combined use of surgical thrombectomy with direct intravenous thrombolytic infusion provided effective treatment of PCD and uncovered an underlying left common iliac vein stenosis, which was successfully managed by angioplasty and stenting.

# TRAUMATIC CAROTID- JUGULAR AV FISTULA IN A CHILD

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## INTRODUCTION

Traumatic Arteriovenous fistulae of the neck vessels are a rare condition, comprising less than 4% of traumatic fistulae found anywhere else in the body.

## METHODS

The authors propose to report a clinical case of such a condition in a 10-year-old boy who sustained a gunshot wound in the left side of the neck.

## RESULTS

Shortly after the event, the patient was admitted to paediatric ICU and intubated for airway protection.

A palpable thrill in the left side of the neck was noticed, giving rise to the need of imaging study. A communication between the left common carotid artery and the internal jugular vein was confirmed by AngioCT. No signs of cerebral hypoperfusion or cardiac overload were present. The surgical correction was performed by direct suture repair of both vessels involved. No complications on the postoperative period. During follow up, antiaggregation with acetylsalicylic acid for 1 month was prescribed and no complications occurred.

## CONCLUSION

The patient lives a normal life with no limitations.

# CAROTID PARAGANGLIOMA - CLASSICAL SURGICAL TECHNIQUE

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## INTRODUCTION

A carotid body tumor is a rare neoplasm, generally benign, that predominantly affects people between their fourth and fifth decades of life. It manifests as a pulsatile and generally painless cervical mass with firm consistency, located below the angle of the jaw. Clinically it can cause localized pain, dysphagia, hiccups, hoarseness and hypersensitive carotid body syndrome. Surgery is the treatment of choice, bearing in mind the possibility of malignant transformation, peritumoral invasion and metastasis. The most widely-used technique is surgical resection, with or without concomitant preoperative endovascular embolisation. Overall complication rates, stroke rates between 0 and 8% and cranial nerve palsy less than 1% to 49%. Mortality rates vary from 0 to 3%.

## METHODS

Clinical case of a 69 years old male patient diagnosed with a carotid body tumor in a routine ultrasound exam. The patient was asymptomatic. Complementary exams were then conducted - CT scan and MRI supported the

diagnosis. Neck CT scan: Well defined, nodular formation, enhanced after intravenous contrast, localized on the jugular-carotid region, with an approximate diameter of 36 mm. Neck MRI: Expansive heterogeneous solid lesion, localized on carotid bulb, well defined, enhanced after intravenous contrast, compatible with carotid paraganglioma – Shamblin's II.

## RESULTS

Patient was submitted to a complete surgical classic resection of the tumor, without any previously procedure. Proximal dissection was made with a help of a nose and ear surgeon.

No post-surgery complications, except wound infection at week 3. No nerve damage.

## CONCLUSION

Follow up to 1 year without any complain and no lesions. In an era of multiple techniques there should always be a place for classic, well planned surgeries.

# LUMBAR CEREBROSPINAL FLUID DRAINAGE IN ENDOVASCULAR AORTIC REPAIR – REFERENCE CENTRE EXPERIENCE

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## INTRODUCTION

Spinal cord ischemia (SCI) and the resulting paraplegia are one of the most feared postoperative complications after thoraco-abdominal aortic surgery, with an incidence 4,3-8,0% after thoracic endovascular aortic repair (TEVAR), increasing patients morbi-mortality. Lumbar cerebrospinal fluid (CSF) drainage catheter is recommended as preventive measure in high risk patients. Objective: To evaluate the efficiency and safety of CSF drainage catheter as preventive or therapeutic measure in endovascular aortic repair (EAR).

## METHODS

Retrospective study in 19 patients submitted to TEVAR or fEVAR (fenestrated endovascular aneurism repair), in whom CSF drainage catheter was used, between January 2010 and March 2017. Collected data regarding demographic, perioperative patients characteristics, neurologic symptoms (NS) and other complications. All patients were submitted to general anesthesia (GA) as result of complexity and length of surgery. Known risk factors (RF) for SCI were taken into account.

## RESULTS

19 patients, 89,5% (n=17) male, mean age of 66±9 years. 63,2% were classified as ASA III and 36,8% as ASA IV. 9 patients submitted to TEVAR (47,4%); the remaining were submitted to fEVAR. 73,7 % were programed procedures. There were intraoperative complications in 3 patients: iliac artery (IA) rupture in 2 patients, laceration of the axillary artery in 1 patient, all required surgical repair. All catheters were placed in awake patients, before GA induction,

and were left in place 2,5 days. 7 patients needed drainage because of CSF pressure > 10mmHg intra- or postoperatively. 3 patients developed early symptoms of SCI (decreased mobility and strength of legs). Complete recovery occurred in all patients, except one who recovered just partially. 1 patient developed late NS: paraparesia on 40th postoperative day (POD) as result of spinal stroke. 30 days mortality was 10,5% (n=2), due to cardiorespiratory arrest– 1 by hypovolemic shock (on 3rd POD), 1 by unknown cause (14th POD).

## CONCLUSION

This study was limited by the small sample size. CSF drainage catheter was an efficient measure in prevention and treatment of SCI in this sample, since there was no case of complications due to SCI. CSF drainage seems to be an effective technique in preventing SCI. Further studies are required to determine the effectiveness and compare the different methods available for the prevention of SCI complications.

RF	N
Previous abdominal aortic surgery repair	8
Severe atherosclerotic disease of thoracic aorta	7
Hypotension	7
Lateral IA lesion	4
Extensive graft coverage of thoracic aorta	6
Left subclavian or hypogastric arteries occlusion	1

# RAPID PACING FOR THORACIC ENDOVASCULAR AORTIC REPAIR: A CASE REPORT

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## INTRODUCTION

Endovascular aortic interventions are suitable alternatives to open surgery, being less invasive and having lower mortality and complications. Accurate positioning of the stent graft is a critical point because of systolic thrush. Techniques used to prevent it include pharmacological (antihypertensive drugs, nitroglycerin, adenosine) and mechanical methods (temporary caval occlusion by balloon). Rapid Right Ventricular Pacing (RRVP) is an emerging alternative with good patient tolerance and low level of complications.

## METHODS

A 79 years-old male, American Society of Anaesthesiology (ASA) status 3 (hypertension, chronic obstructive pulmonary disease and hyperuricemia), with an aortic arch aneurysm previously submitted to an ascendant aortic debranching, was proposed for Thoracic Endovascular Aortic Repair (TEVAR). ASA standard, invasive blood pressure, depth of anaesthesia and cerebral oximetry monitoring were used.

## RESULTS

Patient was sedo-analgesiated with Midazolam 2mg and Fentanyl 100mcg. A flow directed Pacing catheter was passed through an 8.5FR introducer inserted in right internal jugular vein. RRVP was tested to a cardiac frequency of 180 without patient complaint. Two vascular Valiant Thoracic endoprosthesis were placed through a femoral access. At the time of testing position and prosthesis deployment, RRVP was

started and systolic blood pressure dropped to 50mmHg. After stopping the RRVP in both placements, normal rhythm and blood pressure were observed. No relevant changes in cerebral monitoring were found. Final angiography showed no endoleak of prosthesis. The patient was admitted at Post-Anaesthetic Care Unit and discharged after 24hours.

## CONCLUSION

RRVP results in accelerated heart rate, with consequent decrease of intra-aortic blood flow, allowing more precise graft deployment without displacement, which is associated with lower incidence of endoleak. The faster onset of RRVP and rapid return to normal values can shorten the duration of the procedure. The procedure is done with minimal sedation, important in individuals with poor clinical status. This also allows to continually monitor the patient's neurologic status, possibly detecting any prosthetic displacement or acute event. Most complications are puncture-related. Rhythm-associated complications can occur in patients with heart diseases. In this case, no cardiac events were found. RRVP has been used in TEVAR with reliable results and is a good option for difficult cases. It's associated with a lower incidence of complications and less secondary effects than traditional measures, allowing to maintain patients with mild sedation, shortening hospital's length of stay. RRVP seems to be advantageous over traditional methods of controlling blood pressure in patients submitted to TEVAR.



# RISK FACTORS FOR POSTOPERATIVE TRANSFUSION IN CARDIAC SURGERY WITH CPB

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## INTRODUCTION

The use of blood products is routine in cardiac surgery. Use of blood derivatives may vary among institutions and entail high costs and possible complications. This study aims to identify predictors of the need for postoperative blood products transfusion after cardiac surgery with cardiopulmonary bypass (CPB), in order to focus on preventive measures for high-risk populations.

## METHODS

Observational retrospective study carried out in 104 consecutive adults who underwent cardiac surgery using CPB in our hospital. Blood products used were categorized according to the Universal Definition of Perioperative Bleeding (UDPB) in adult cardiac surgery<sup>1</sup> (table 1). Clinical, demographic and surgical variables were analyzed.

Statistical analysis was performed using SPSSv23. Quantitative variables are expressed as mean  $\pm$  standard deviation and qualitative variables as proportions (%). Values of  $p < 0.05$  were considered statistically significant.

## RESULTS

104 patients, 74 males (71,2%), with an average age of  $67,2 \pm 13,4$  years were included. Mean body mass index (BMI) was  $26,1 \pm 4,2$  Kg/m<sup>2</sup>, and 5,8% were ASA II, 92,3 % ASA III and 1,9% ASA IV. Operative procedures included coronary artery bypass in 32 (30,8%) patients, valvar operations in 59 (56,7%), and combined procedures in 7 (6,7%), with 6 omissions. Forty patients (38,5%) received at least one blood product in final postoperative 24h. The distribution of blood products used according to UDPB in adult cardiac surgery is expressed in table 2. There were no significant

Table 1

**Bleeding categories, according to the UDPB in adult cardiac surgery (if different categories indicate mixed definitions of bleeding, the worst definition applies)**

Bleeding definition	Sternal closure delayed	Postoperative chest tube blood loss within 12 hours (mL)	PRBC (units)	FFP (units)	PLT (units)	Cryoprecipitate	PCCs	rFVIIa	Reexploration/tamponade
Class 0 (insignificant)	No	<600	0*	0	0	No	No	No	No
Class 1 (mild)	No	601-800	1	0	0	No	No	No	No
Class 2 (moderate)	No	801-1000	2-4	2-4	Yes	Yes	Yes	No	No
Class 3 (severe)	Yes	1001-2000	5-10	5-10	N/A	N/A	NA	No	Yes
Class 4 (massive)	N/A	>2000	>10	>10	N/A	N/A	N/A	Yes	N/A

UDPB, Universal definition for perioperative bleeding; PRBC, packed red blood cells; FFP, fresh frozen plasma; PLT, platelet concentrates; PCCs, prothrombin complex concentrates; rFVIIa, recombinant activated factor VII; N/A, not applicable.

\*Correction of preoperative anemia or hemodilution; the number of PRBC's used should only be considered in the UDPB when accompanied by other signs of perioperative bleedings.

statistical differences in blood products transfusion between gender, age, BMI, diabetes, Left Ventricular Ejection Fraction (EFLV) and CBP duration.

Although there was no significant correlation between hypertension and postoperative use of blood products, there was a strong positive association between the absence of hypertension and UDPB class 0. In our population, there was a significant association between the type of surgery and UDPB score. There seems to be a strong positive association between valvular surgery and UDPB class 0 and between combined procedures and UDPB class 1. Reoperation for bleeding within 24h was required in 3,8%.

### CONCLUSIONS

In our population, the independent predictor of postoperative bleeding was the type of surgery, with a strong positive association between valvular surgery and

**Table 2** Distribution of blood products to UDPB in adult cardiac surgery

Haemorrhage	n	%
Class 0 - Insignificant	71	68,30
Class 1- Mild	6	5,80
Class 2 - Moderate	22	21,20
Class 3 - Severe	5	4,80
Class 4 - Massive	0	0
Total	104	100

combined procedures and UDPB class 0 and 1, respectively. The percentage of reoperations due to bleeding after cardiac surgery is in accordance with the literature.

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# REVERSAL OF ACUTE SPINAL CORD INJURY IN THE IMMEDIATE POST-OPERATIVE PERIOD AFTER THORACOABDOMINAL ANEURYSM REPAIR WITH CSF DRAINAGE

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## INTRODUCTION

Spinal cord injury after thoracoabdominal aortic aneurysm surgery is a devastating and unpredictable complication (1). With surgical manipulation, particularly with aortic clamping, cerebrospinal fluid (CSF) pressure may rise, and its pressure exceeds the spinal arterial pressure, spinal perfusion may be reduced, leading to neurological dysfunction.

## METHODS AND RESULTS

This clinical case reports to a 70-year-old male patient with an early onset of post-operative paraesthesia

of the lower limbs in the immediate post-operative period of thoracoabdominal aortic aneurysm repair. Reversal of the neurological deficit was achieved after emergency CSF drainage.

## CONCLUSION

CSF drainage has a therapeutic potential value of reducing its pressure, allowing an improvement of spinal perfusion pressure, therefore diminishing the risk of an ischemic and permanent lesion(2), thus it may have a role in preventing and/or treating acute paraplegia.

# PERIOPERATIVE FAMILY CENTERED CARE: NURSING INTERVENTIONS THAT SUPPORT CHILD AND FAMILYS' EMOTIONAL MANAGEMENT

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## INTRODUCTION

Hospitalization is a negative tonality experience for both child and family, being fear and anxiety their emotional mirror. Concerning the surgical experience, the environment, invasiveness, fear of pain, of not waking up from anaesthesia and parental separation are both causes and enhancers of child and family perioperative distress. A study concerning parent's emotional experience of child's submitted to cardiac surgery, refer guilt for their son's cardiopathy, a roller coaster of emotions, impotence and being seated on pins and needles while waiting during the surgery. Objective: Identify and map the scientific production concerning nursing interventions that promote child and family's perioperative emotional management.

## METHODS

Literature was searched in CINAHL and MEDLINE, and also on Joanna Briggs Institute (JBI) Database of Systematic Reviews and Implementation Reports and Cochrane Library. Search was done using all identified keywords and index terms. The study will consider quantitative and qualitative studies, as well as systematic reviews. The quantitative studies will include, although not being limited to experimental and epidemiological study designs. The qualitative studies will include, although not being limited to phenomenology, grounded theory and ethnography. The

systematic reviews will include meta analysis and meta synthesis. Unpublished literature will also be considered.

## RESULTS

Specifically in paediatric perioperative care, the use of preoperative programs based on psycho-emotional resources adapted to the child's age range, results in fear and anxiety's reduction and consequently increasing well-being. Regarding parental presence during anaesthetic induction, it has a very important effect in decreasing both child and parent's anxiety. However, it should be supported and programed so that it is safe and effective. Communication with family during surgery, attending to multidisciplinary organization, periodicity and supported by a nursing liaison program, is particularly important in decreasing family's anxiety during intraoperative period.

## CONCLUSION

Family centred care are the paediatrics' care philosophy. Concerning the perioperative period, it expresses through several interventions like preoperative preparation, parental presence and nursing liaison. These nursing interventions are particularly important in decreasing stress and anxiety, promoting safety, respect and well-being, and also because it promotes the child's development and facilitates future experiences.

# ANALGESIA MANAGEMENT FOR MITRAL VALVE REPAIR VIA MINITHORACOTOMY – A CASE REPORTE

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## INTRODUCTION

Minimally invasive cardiac surgery (MICS), via minithoracotomy, is thought to be a fast track to extubation and recovery after surgery. Chronic pain, due to intercostal nerve injury, develops in up to 50% of postthoracotomy patients. A number of regional anaesthesia and analgesia techniques may be employed, and the anaesthesiologists play a key role in facilitating optimal outcomes after surgery.

## METHODS

We report a case of postoperative pain management with a local anesthetic infiltration for MICS.

## RESULTS

A 63-year-old woman, 80kg, American Society Anaesthesiology (ASA) physical status 3 [arterial hypertension, atrial fibrillation (AF), rheumatic mitral stenosis and class II NYHA heart failure] was presented for an elective minimally invasive mitral valve repair through a minithoracotomy and cryoablation of AF. No relevant facts were found on pre-operative evaluation. Calculated EuroScore II was 1.55%. After premedication with intravenous (IV) midazolam 1.5mg, radial arterial and jugular central venous catheter were placed. General anaesthesia was induced with IV remifentanyl 1mcg/kg/h, propofol 50mg, rocuronium 1mg/kg. A transesophageal echocardiography probe was inserted atraumatically, which revealed thickened mitral valve leaflets. ASA standard, invasive blood pressure, central venous pressure, depth of anaesthesia and cerebral oximetry

monitoring were used. Urine output and arterial blood gas were measured periodically. A right lateral minithoracotomy was performed. After cardiopulmonary bypass (CPB) by femoral cannulation, cryoablation was performed followed by placement of the mechanical prosthesis. Total bypass time was 186min including 139min aortic cross-clamping time. At the ending of CPB, there was no need for inotropic support. Analgesia with paracetamol 1g, tramadol 100mg and morphine 10mg was performed after protamine reversal. Immediately before closure of skin, catheter was placed nearly to intercostal space (figures 1, 2) and ropivacaine 0,75% 75mg was administered. Anaesthesia and surgery were uneventful. Patient was shifted to intensive care unit (ICU), being extubated 3 hours after surgery. There was no need for additional bolus of ropivacaine during 2 days of ICU stay. She was discharged home on the 4th postoperative day, without complications. In a telephone interview 3 weeks after surgery, the patient referred no pain and good satisfaction with analgesia management.

## CONCLUSION

Thoracotomy incisions are associated with severe pain, leading to a decrease in pulmonary function, an increase in metabolic and hormonal activity and increased cardiac morbidity. Regional analgesia techniques have an opioid-sparing effect, reducing stress response and pain chronification. The local infiltration through catheter with local anaesthetics allows excellent analgesia for 8-12 hours, providing a route of additional analgesia according to pain control.

# IS INVASIVE PRESSURE MONITORING MORE RELIABLE THAN NON-INVASIVE IN PATIENTS WITH CARDIOVASCULAR PATHOLOGY? – A CASE REPORT

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## INTRODUCTION

Patients undergoing carotid endarterectomy (CEA) require strict arterial blood pressure (BP) control to maintain adequate cerebral perfusion. Invasive blood pressure (IBP) is the gold standard, however artifacts may lead to erroneous readings.

## METHODS

We report a case of CEA using IBP monitoring.

## RESULTS

A 64-year-old man, American Society Anaesthesiology (ASA) physical status 3 (diffuse atheromatosis, dyslipidemia and non-medicated hypertension), was presented for an elective right CEA. ASA standard, neuromuscular block monitoring, anesthesia depth and cerebral oximetry were used as monitorization. On preanaesthetic assessment noninvasive BP (NIBP) had no significant difference between right and left arms (180/90 mmHg). IBP monitoring was placed in left radial artery after several attempts in both arms. Surgery was performed under balanced general anesthesia (GA). Intra-operatively the patient remained stable (140/86 mmHg) however the systolic carotid artery

stump pressure (SP) was 210-220mmHg. This finding was confirmed by measuring NIBP in both legs. At this point NIBP was used to monitor and guide the BP target until the end of the procedure and during postoperative period (PO) in postanesthetic care unit (PACU). Surgery proceeded uneventfully. After discharge to the ward (48h stay at PACU), a hypertensive crisis lead to cervical neck haematoma which required emergent surgery under GA. Intraoperatively the BP was assessed with NIBP. After a new period of 48h at PACU the patient was discharged to the ward and subsequently from the hospital on the 8th postoperative day, without further complications.

## CONCLUSION

IBP allow beat-by-beat measures with optimization of BP in order to improve cerebral perfusion during CEA. IBP can be inaccurate in patients with diffuse atheromatosis. NIBP may be an alternative, however is not continuous and is expected to be less accurate than the IBP.<sup>1</sup> The high IBP-NIBP difference (>40 mmHg) was clinically relevant and in this patient might be explained by diffuse atheromatosis. NIBP was compatible with carotid SP, indicating that, in this case was a reliable and accurate method of monitoring.

# HEPARIN RESISTANCE DURING SURGICAL RESECTION OF INFERIOR VENA CAVA AND RIGHT ATRIAL TUMOR THROMBUS: A CASE REPORT

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## INTRODUCTION

Heparin resistance is the failure of unusually high doses of heparin to achieve a target activated clotting time (ACT). We present the case of a 47-year-old female patient, ASA 2, who was diagnosed with a neuroendocrine retroperitoneal tumor with thrombus in the left

renal vein, inferior vena cava and right atrium. General and cardiothoracic surgeons collaborated to remove the tumor under cardiopulmonary bypass. Heparin resistance was considered and treated with 1000 UI of antithrombin III concentrate. The authors review the mechanisms and management of this entity.

# ANAESTHETIC MANAGEMENT IN A DUCHENNE MUSCLE DYSTROPHY PATIENT FOR TREATMENT OF RECURRENT PNEUMOTHORAX

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## INTRODUCTION

Duchenne muscular dystrophy (DMD) is an x linked recessive disorder. Long term prognosis is ominous, with development of respiratory distress and cardiomyopathy in advanced stage of the disease and expected death in the teens-to-mid 20s due to respiratory or cardiac failure. Peri-operative management of this patients is challenging due to difficult airway anatomy (macroglossia, limited neck and mandibular mobility). Additionally, they are at risk of developing malignant hyperthermia, rhabdomyolysis and hyperkalemic cardiac arrest when exposed to halogenated inhalational anaesthetics and depolarizing muscle relaxants.

## METHODS

We describe a case of DMD proposed to a thoracotomy for treatment of recurrent pneumothorax and its anaesthetic approach.

## RESULTS

A 22-year-old male patient with DMD presented at emergency department due dyspnoea starting at 3 days associated with right scapular pain, enhanced by breathing.

The patient already presents with mild cardiomyopathy (ejection fraction of 55%, mild mitral and tricuspid regurgitation), severe restrictive respiratory defect, requiring continuous BiPAP.

The patient was markedly denourished (BMI of 12 kg/m<sup>2</sup>) and presented with nearly absent breathing sounds on the right side. Chest radiography showed large pneumothorax on the right side with no signs of tension. Drainage was performed. Despite initial success, recurrence of

pneumothorax occurred on the several attempts of clamping. A bronchopleural fistula was suspected and operative treatment was considered. Considering the comorbidities, he was graded ASA IV with a difficult airway due to macroglossia, limited neck and mandibular mobility.

Oro-tracheal intubation was performed with slight sedation (propofol, without neuromuscular blocks). Difficult airway anatomy (direct laryngoscopy - Cormack 4) successfully approached with a bougie and McCoy blade. Fiberoptic intubation approach was immediately available in the operating room, if required. Total intravenous anaesthesia was decided (remifentanyl and propofol, administered by continuous infusion, without neuromuscular blockers). Volume controlled protective ventilation as used (tidal volume 6-8ml/kg, respiratory frequency of 14-16/min; FiO<sub>2</sub>: 0,5). No bronchopleural fistula was detected and pleurodesis was performed with biologic glue. Patient remained intubated and was transferred to the ICU for monitoring, having been discharged on the 2nd day to the ward. Despite this, pneumothorax recurrence occurred, and surgery was performed again, using the same anaesthetic approach, this time with successful closure of the bronchopleural fistula.

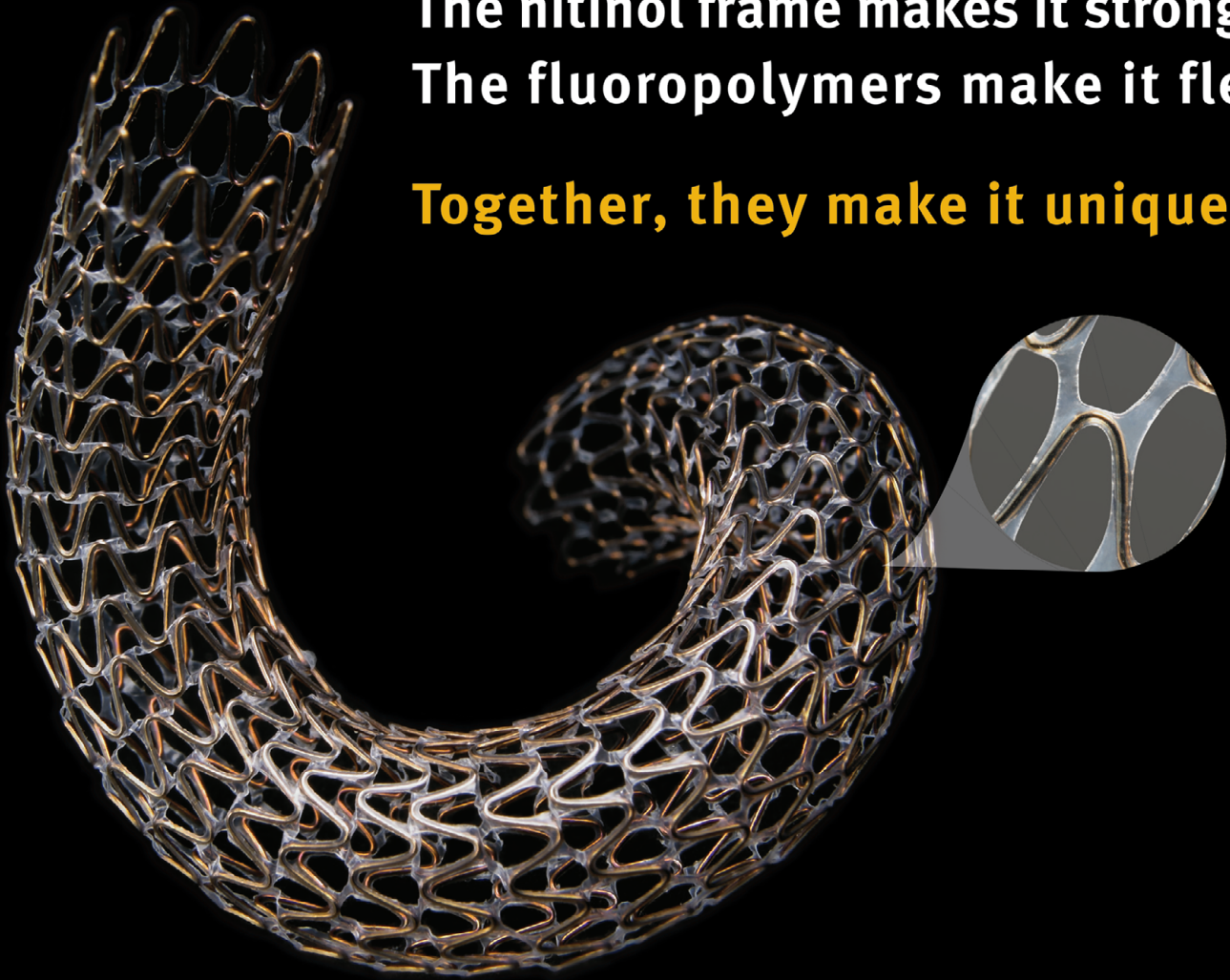
## CONCLUSION

Total intravenous anaesthesia, without neuromuscular blockers, is a safe and effective option for DMD patients. Anaesthesiologists must consider the possibility of cardio-pulmonary disabilities, difficult airway management, as well as the high risk of malignant hyperthermia in these patients.



The nitinol frame makes it strong.  
The fluoropolymers make it flexible

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TIGRIS®

VASCULAR STENT

# daflon<sup>®</sup> 500

Bioflavonoides - Fração Flavonóica Purificada Micronizada

## Bioflavonoides micronizados<sup>1</sup>

para uma

## ELEVADA EFICÁCIA CLÍNICA<sup>2</sup>



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 QUALITATIVA e QUANTITATIVA:** 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 FARMACÉUTICA:** 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 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, deverá consultar o seu 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 teratogénico. 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 condução e utilizar máquinas\*.** **Efeitos indesejáveis:** Muito frequentes ( $\geq 1/10$ ); Frequentes ( $\geq 1/100$ ,  $< 1/10$ ); Pouco frequentes ( $\geq 1/1.000$ ,  $< 1/100$ ); Raros ( $\geq 1/10.000$ ,  $< 1/1.000$ ); Muito raros ( $< 1/10.000$ ); desconhecido (não pode ser calculado a partir dos dados disponíveis). Doenças do sistema nervoso - Raros: tonturas, cefaleias, mal-estar. Doenças gastrointestinais - Frequentes: diarreia, dispepsia, náuseas, vômitos. Pouco frequentes: colite. Frequência desconhecida: dor abdominal. Afeções do tecido cutâneo e subcutâneos - Raros: erupções cutâneas, prurido, urticária. Frequência desconhecida: edema isolado da face, lábios, pálpebras. Excepcionalmente edema de Quincke's. **Sobredosagem:** Não foram descritos casos de sobredosagem. Em caso de sobredosagem accidental, 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. **TITULAR DA AUTORIZAÇÃO DE INTRODUÇÃO NO MERCADO:** Servier Portugal - Especialidades Farmacêuticas, Lda. Av. António Augusto de Aguiar, 128, 1069-133 LISBOA. Tel: 21 312 20 00. Fax: 21 312 20 91. e-mail: servier.portugal@pt.netgrs.com **APRESENTAÇÃO:** Caixa de 60 comprimidos revestidos por película. MNSRM. Para mais informações deverá contactar o titular de AIM. RCM aprovado em julho de 2015. IECRCM 26.04.2017. \*Para uma informação completa por favor leia o resumo das características do medicamento.

1. Dossier de Registo aprovado

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