CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE

CONTROVERSIES & UPDATES IN VASCULAR SURGERY

JANUARY 19-21 2017

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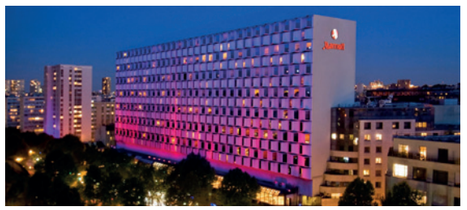

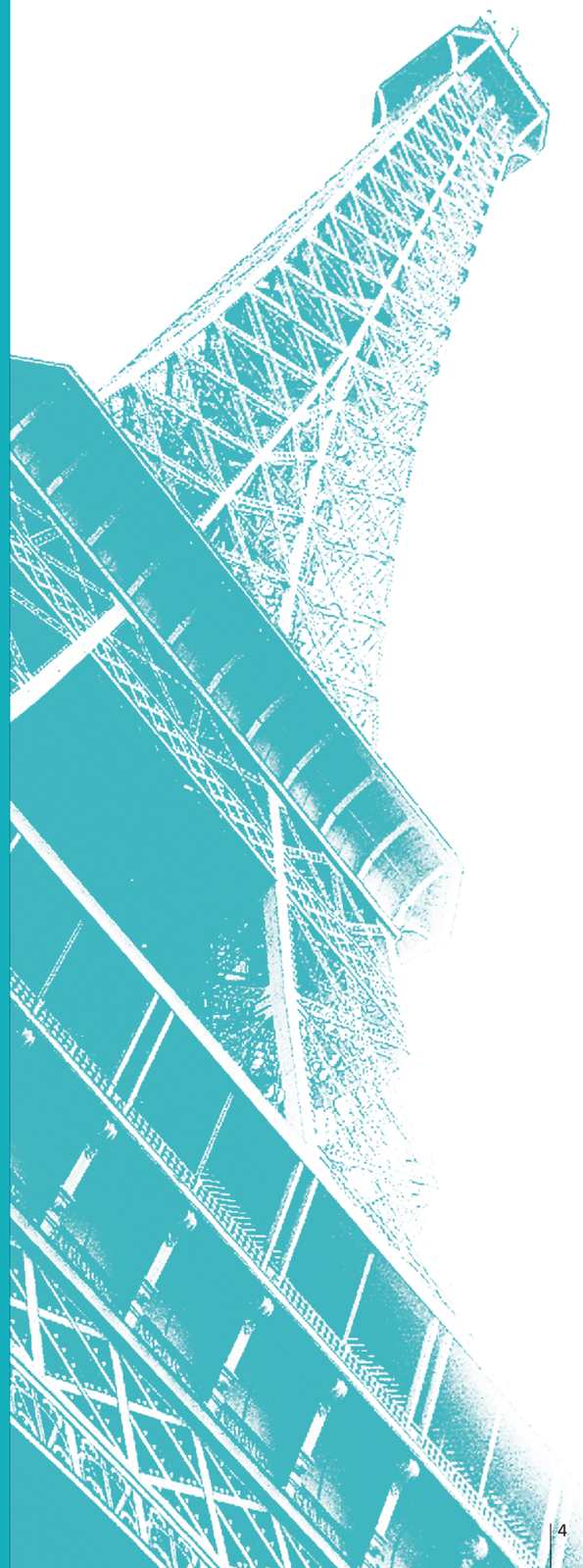

THURSDAY JANUARY 19

– MAIN PROGRAM –

DISEASES OF THE THORACIC AORTA

Aortic arch. Arch hybrid procedures: are they effective and durable?

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Aneurysms of thoracic aorta and aortic arch that require proximal stent fixation and sealing at the level of the aortic arch are a challenge to treat with open surgical techniques, especially as many of these elderly patients have significant co-morbidity. Arch hybrid techniques have been developed to extend the proximal sealing zone of thoracic stent grafts to avoid sternotomy/thoracotomy and cardiac bypass. Carotid-subclavian, carotid-carotid and ascending-carotid bypasses can be used to create a stable and effective landing zone for stent graft placement.

These techniques are now being challenged by further advances in stent graft design. Fenestrated and branched systems for the aortic arch are emerging with encouraging short-term results. Understanding the effectiveness and durability of hybrid techniques is essential as a comparison with open surgical and totally endovascular techniques.

Our series of 55 arch hybrid procedures [1] (27.3% of patients required aortic de-branching to facilitate endograft placement in zone 0, 34.5% in zone 1 and 38.2% in zone 2) has demonstrated an excellent early effectiveness using this technique in terms of technical success (92.7%) and exclusion of endoleak. 30-day mortality for urgent and elective procedures was 2.1% and 14.3% in elective and emergency cases respectively, and 3.6% overall. The Achilles heel of this procedure appears to be that of stroke. The rate of procedural stroke was 12.5% in elective cases, 28.6% in emergency cases and 14.5% overall. Over a mean follow up period of 74.6 months in this group of patients, cumulative survival was as expected for a group of patients after extensive aneurysmal disease treatment- 70% at 1 year, 68% at 2 years and 57% at 5 years. Re-intervention to the proximal landing zone for type 1a endoleak was required in only 5.7% of cases, suggesting that using hybrid procedures to gain a safe proximal landing zone is a durable option. Overall extra-anatomical graft patency was 98.7%.

Our experience has shown that arch hybrid procedures can be effective in the short term and produce a durable proximal landing zone for thoracic stent grafts. Endovascular approaches, although seemingly effective in the short term in selected patients, should be compared to the long-term results of hybrid procedures as part of their assessment. There is a significant stroke rate after this procedure and improvements for hybrid and endovascular techniques should focus on reducing this complication significantly.

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DISEASES OF THE THORACIC AORTA

Aortic arch. Total endovascular arch repear: what we learned so far?

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Any treatment of aortic arch disease is demanding and technically challenging. Open repair is the gold standard in the treatment of aortic arch pathology, having benefited in recent years from the technological improvements that have brought the achievement of safer outcomes and reduced mortality.[1,2] However, death and stroke rates after open arch repair are still high.[3,4] Hybrid or total thoracic endovascular repair (TEVAR) have been increasingly used as an alternative in patients who were previously denied open surgery because of relevant comorbidities.[5,6] Hybrid repair consists of a supra-aortic debranching procedure to secure a proximal landing zone required for stent-graft placement.[7] A variety of debranching procedures can be used in patients with arch diseases with results at least comparable with those of open surgery at selected centers.[8] Continued development and evolution of thoracic endografts has allowed the application of total endovascular repair or minimally-invasive hybrid approach to complex aortic arch disease by the use of fenestrated and branched devices. In addition to the standard straight model, some companies have in their portfolio a custom-made or off-the-shelf arch branched stent-graft. The Bolton branched arch device is a custom-made thoracic stent-graft based on Relay NBS platform (Bolton Medical EspaÒa, Barcelona, Spain; Bolton Medical, Inc., Sunrise, FL, USA). The distinguishing feature is a large window in the superior aspect of the endograft that can accept one or two inner branches.The Cook branched arch device (Cook Medical, Bloomington, IN, USA) is a custom-made thoracic stent-graft that consists of two internal branches with an enlarged external opening at their distal ends. The ends of the endograft are wide and flexible, whereas the middle, the branch bearing portion, is narrow and straight. The aim of this design was to separate the orifices of the branches from the ostia of supra-aortic trunks, preserving perigraft flow and facilitating branch cannulation. The Gore TAG Thoracic Branch Endoprosthesis (TBE) (W.L. Gore & Associ- ates, Flagstaff, AZ, USA) is an off-the- shelf single-branch device that consists of an aortic component with an internal reverse branch and a side branch dedicated component. The side branch component is delivered through a sheath from a femoral access and deployed in a reverse fashion into the docking zone of the aortic component, allowing the perfusion of a single arch branch vessel. The Medtronic Valiant Mona LSA (Medtronic Inc., Santa Rosa, CA, USA) is an off-the-shelf single-branch device based on the Valiant Captivia thoracic stent-graft system. It consists of a main graft for placement in the aneurysmal segment of the aorta, and a dedicated branch graft for placement in the left subclavian artery (LSA). The endovascular approach to arch pathology is currently reserved for patients deemed unfit for open and/or hybrid repair. The major concern in complex arch stent-grafting derives from the proximity of the aortic valve and coronary ostia, and the potential neurologic complications inflicted by a hypothetical flow-limiting stent-graft misalignment or embolization events. In their multicenter experience on 38 patients treated with the Cook arch branched device, Haulon*et al.*reported a 30-day mortality of 13.2%, with cerebrovascular complication rate of 15.8%. The authors also described feasibility criteria for arch branched repair: no prior mechanical aortic valve replacement, ascending aortic length >50 mm, sealing zone within the ascending aorta <38 mm diameter, innominate artery <20 mm in diameter and >20 mm in sealing zone length, and iliac access able to accommodate 22 or 24 F sheaths.[9]

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DESCENDING AORTA

Imaging. Benefit of intraoperative fusion imaging for aortic dissection management

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Endovascular repair of dissection is probably one of the more challenging procedure to navigate in the true and false lumens and to catheterize visceral vessels.
Conventional operative imaging systems provide only two-dimensional fluoroscopic images with subtraction and roadmapping. The preoperative CTA data (position of the aortic branches, true and false lumen location …) are available in the operative room, only on a separate screen.
Current developments in image-guided therapy allow a combination of these 2 imaging techniques during the operation to facilitate complex endovascular repair of aortic dissections in locating the true and false lumen and identifying perfusion of visceral vessels by the 2 lumen.
Briefly, semi-automated reconstructions of true and false lumen 3D aortic volumes (masks) are derived from the pre-operative CT scan prior to the procedure using a 3D workstation. Different colors are attributed to each mask and virtual reference markers are placed to mark the dissection flap tears and the major supra aortic and visceral collaterals. During the procedure, the different masks could easily be selected by the interventionist and displayed individually or in any combination. These data are then superimposed on the fluoroscopic images in order to facilitate deployment of a complex aortic or branch endograft for the treatment of entry tears as well as for the management of residual flow of the false lumen.
Fusion imaging proved helpful for catheterization of target vessels, reducing time of intervention, contrast injection and irradiation. However, it is important to acknowledge that target organs, are constantly on the move due to respiratory and cardiac motion and the deformations imposed by stiff guidewires and Stent Grafts can lead to a mismatch between the overlaid 3D preoperative CT and the real location of the arterial structures. If we do not get this right, the end result is a series of major complications.
As a whole, in my view, the trick is to use these devices critically and with full awareness of their frailties. Above all, we must not become the daft driver blindly following his/her sat nav off the end of the pier and remember to always trust your interventional instincts, above all else.

DESCENDING AORTA

How to manage the false lumen. What are the new tools, how to use them?

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Thoracic endovascular aortic repair (TEVAR) represents a valid treatment for complicated type B aortic dissection either in the acute or chronic phase, with the aim to exclude the false lumen (FL), covering the primary entry tear and stimulating remodeling of the thoracic aorta. Several factors play a role in this process but nowadays not all of them are clear.
As reported by several Authors, false lumen (FL) thrombosis with progressive reduction of its diameter is correlated with the aortic remodeling. However in chronic dissections (CAD) FL thrombosis rate is lower when compared to acute dissections (AAD). However residual patency of the FL is not a predictor of 5-year mortality, as reported in the literature.
FL management is based on two different strategies: embolization/occlusion and compression. In the first group different options are available: embolization can be performed using the candy-plug technique or the knickerbocker technique. Embolization of the FL cam also be done using coils alone or in combination with glue.
Compression of the FL can be achieved using a bare metal stent, with high radial force, that is deployed into the TL, enlarging it and compressing completely the FL. Two more options are based on the complete disruption of the FL using the scissors technique or the funnel technique.
Extensive thoracic coverage, which is believed to give a greater rate of false lumen thrombosis, may result in increased the risk of spinal ischemia.
More studies are required to evaluate in deep alll these options and fiind the most suitable to increse the FL thrombosis with a low rate of complications.

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FRIDAY JANUARY 20

– MAIN PROGRAM –

ANEURYSMS OF THE ABDOMINAL AORTA

AAA infra renal. Do cardiovascular drugs reduce AAA enlargement?

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Most trials of screening for potentially fatal conditions, including the abdominal aortic aneurysm (AAA) trials, have used disease-specific mortality as their primary outcome, and most authorities accept a reduction in disease-specific mortality as sufficient to conclude benefit from screening. However, several prominent articles published in 2015 challenged the value of ultrasound screening for AAA based on what their authors perceived as a lack of a demonstrated reduction in total mortality from screening. In fact, meta-analysis of the longest term follow up of the four trials of AAA screening clearly shows a small but statistically significant reduction in total mortality. This remains true with the addition of the new longterm data from the Western Australia trial. The 2015 papers either failed to use the latest reports from the trials or missed the difference due to inappropriate rounding in the reporting of the confidence intervals. Surprisingly, this latter error was originally by the US Preventive Services Task Force. Debate on the merits of aneurysm screening will likely continue, but first we should get the numbers right.

ANEURYSMS OF THE ABDOMINAL AORTA

AAA infra renal. Duel. Detection of AAA. Detection of AAA saves life

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Although aneurysm of the abdominal infra-renal aorta (AAA) meets criteria warrantingB mode ultrasound screening, the advantages of mass screening *versus* selective targeted opportunistic screening remain a subject of debate. In France, the French Society of VascularMedicine (SFMV) and the Health Authority (HAS) published recommendations for targeted opportunistic screening in 2006 and 2013 respectively. The SFMV held a mainstream communicationday on November 21, 2013 in France involving participants from metropolitan France and overseas departments that led to a proposal for free AAA ultrasound screening: the Vesaliusoperation. Being a consumer operation, the selection criteria were limited to age (men andwomen between 60 and 75 years); the age limit was lowered to 50 years in case of direct familyhistory of AAA. More than 7000 people (as many women as men) were screened in 83 centerswith a 1.70% prevalence of AAA in the age-based target population (3.12% for men, 0.27% forwomen). The median diameter of detected AAA was 33 mm (range 20 to 74 mm). The prevalenceof AAA was 1.7% in this population. Vesalius data are consistent with those of the literature bothin terms of prevalence and for cardiovascular risk factors with the important role of smoking.Lessons from Vesalius to take into consideration are: screening is warranted in men 60 years and over, especially smokers, and in female smokers. Screening beyond 75 years should be discussed.Given the importance of screening, the SFMV set up a year of national screening forAAA (Vesalius operation 2014/2015) in order to increase public and physician awareness aboutAAA detection, therapeutic management, and monitoring. AAA is a serious, common, diseasethat kills 6000 people each year. The goal of screening is cost-effective reduction in the deathtoll.In 2015 we detect 729 AAA. With a prevalence of 2%, 36500 patients have been detected. For the 729 AAA, 605 men and 124 women, with a sex ratio woman/men of 1/5. The mean age of the AAA: 68 year old for women and 75 for men, 90% of the women smoked.61% of the AAA have a diameter between 30 and 39 mm,n 15.5% between 40 and 15 mm, 6.3% 46/49 mm and 17.2% more than 50 mm (126 AAA).One AAA detected out of six measure 50 mm of diameter. We need detect in a select population 289 patients for one 50 mm AAA.We save un this study 126 life. In th other hand we find a significant number aneurysm in women. As Lerderle say: "The success of a screening program largely depends on how patients are managed after the screening test.... Of greatconcern for patients with small AAAs detected at screeningis the risk of unnecessary procedure". That's the main problem. But with AAA detection we save life, it's indisputbale. Each physician of any specialities that use ultrasound, have to detect AAA in a seleted population, in France this unorganized AAA dtection can be a cheep and effective solution n that's France!

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ANEURYSMS OF THE ABDOMINAL AORTA

AAA ruptures. Can rupture be predicted by 4D US Wall stress analysis?

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Wall stress analysis has been introduced to predict the potential rupture risk of the AAA wall, which is mostly performed using computed tomography and sparsely with magnetic resonance imaging data. This approach suffers from several drawbacks, such as the use of ionizing radiation and nephrotoxic contrast agents for CT imaging, the long scanning time and high cost for
MRI, and the unavailability of patient-specific material properties.
Three-dimensional ultrasound (3D US) imaging overcomes abovementioned disadvantages of CT and MR, and even enables the possibility to acquire the vessel's motion during the cardiac cycle (4D US). Using the dynamic behavior of the AAA wall, finite element models can be calibrated to the vessel motion and thereby more patient-specific material properties can be derived. Also patient-specific and FEM-regularized strains and wall stresses become available using 3D US.

However, performing wall stress analysis based on 3D ultrasound has many advantages over CT, although, the field-of-view (FOV) of 3D US is limited and the aortic bifurcation is not easily imaged. In a study we assessed the influence of a limited FOV by performing wall stress analysis on CT-based (total) AAA geometries in 10 patients. Results reveal that changes in the 99th percentile wall stresses are less than 10% when the proximal and distal shoulders of the aneurysm are in the shortened FOV. Wall stress results show that the presence of the aortic bifurcation in the FOV does not influence the wall stresses in high stress regions.

In another study wall stress analysis (WSA) was performed using 4D ultrasound. 4D-US images were acquired for 40 patients (AAA diameter 27-52 mm). Patient specific AAA geometries and wall motion were extracted from the 4D-US. WSA was performed and corresponding patient specific material properties were derived. For seven patients, CT data were available and analyzed for geometry and wall stress comparison. Regression analysis showed no significant relation between wall stress and diameter of the AAA. The similarity indices between US and CT were very good and ranged between 0.90 and 0.96, and the 25th, 50th, 75th, and 95th percentile wall stresses of the US and CT data were in agreement.

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ANEURYSMS OF THE ABDOMINAL AORTA

EVAR *versus* endo. Where are we?

Why RCT's and guidelines are often misleading: how to make a proper decision?

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The results of good randomized controlled trials (RCTs) published in leading peer-reviewed journals have been deemed the best possible basis for good medical practice. However, several limitations may decrease their value. These include flaws and weaknesses in the design and the timeliness of RCTs. Progress in a treatment method or control arm may invalidate a trial. So too can defects in patient selection, physician competence, randomization, applicability, end points, and the population being studied. Idiosyncratic flaws can also invalidate an RCT. Examples of these flaws and weaknessesare presented. Another problem with articles describing RCTs is the potential for the conclusions of the trial report to be misleading because of error or bias. This plus subsequent misinterpretation of the trial results or conclusions by others can make the effect of the trial misleading with an unintended detrimental result on medical practice. Guidelines based on such errors or bias-based conclusions and misinterpretations can further compound the problem. This article provides examples of misleading conclusions and/or misinterpretations (spinning) of trial results in articles describing RCTs in leading journals. All physicians should recognize these value-limiting processes so that RCTs can be evaluated adequately and fairly. In that way, they can be used along with good physician judgment to optimize the care delivered to individual patients and to society at large. (J Vasc Surg 2013;57:3S-7S.)

The management of a number of medical conditions is controversial. It is, therefore, often difficult for individual practitioners to judge objectively which one of several treatments is best for their patients. Because of this, guidelines have evolved as a way to facilitate optimal patient outcomes by summarizing current knowledge when it is complex, evolving, and difficult for interested parties to assess on their own. Unfortunately, the process of defining guidelines is flawed, and the potential for this is highlighted in a recently published systematic review of 34 current international guidelines dealing with the treatment of carotid disease in patients with moderate or severe asymptomatic (ACS) or symptomatic carotid stenosis (SCS). In a comprehensive analysis of guideline treatment recommendations from 23 countries, published in six languages from 32 different writing groups, Abbott and colleagues have documented guideline weaknesses leading to a variability in treatment recommendations. For instance, 100% of applicable guidelines endorsed carotid endarterectomy (CEA) for average-CEA-risk SCS, and 96% endorsed CEA for average-CEA-risk ACS. However, there was a more notable variation in carotid artery stenting (CAS) recommendations. CAS was endorsed (recommended that it should or may be provided) for average-CEA-risk ACS by 63% of applicable guidelines, while 30% explicitly opposed it. CAS was endorsed for average-CEA-risk SCS by approximately 50% of applicable guidelines, while approximately 25% explicitly opposed it. Endorsements of CAS for ACS and SCS were common, despite the lack of randomized trial data showing that CAS is at least as good as CEA or medical treatment alone for stroke prevention. Randomized trial and registry evidence of the dangers of CAS for average-CEA-risk patients was under represented in many of these guidelines. CAS was also variably endorsed for patients considered at highrisk-for-CEA because of vascular anatomy, medical comorbidities, or undefined reasons. Such endorsements were found in 49% of applicable guidelines with respect to ACS and 84% of guidelines with respect to SCS.This is despite the absence of any randomized data showing that any procedure improves outcomes over medical treatment alone, and the limited life-expectancy of many such patients. There was also a notable variation in the inclusion of medical treatment recommendations. Any recommendations regarding general medical treatment were included in only 68% of guidelines regarding ACS, and in 91% regarding SCS. Specific recommendations regarding peri-CEA or peri-CAS medical treatment were found in only 50% and 32% of applicable guidelines, respectively, for ACS. Only 48% of guidelines contained such recommendations regarding SCS. Furthermore, when

medical treatment recommendations were included, they were usually incomplete and often separated from procedural recommendations and omitted from summaries. Perhaps of more importance were the weaknesses in current international guidelines brought to light by what they have in common. In all 34 guidelines identified in the review by Abbott *et al.*, all procedural endorsements were based directly or indirectly on old comparisons of carotid endarterectomy and what is now obsolete medical treatment in patients who were randomized 12-34 years ago. In addition, when included in the guidelines, the 30-day risk of stroke or death said to confer an overall patient benefit from CEA (usually 3% for ACS and 6% for SCS) was derived from the same old, and now obsolete, randomized trials. The stroke prevention efficacy of medical treatment alone (encouraging a healthy lifestyle and appropriate use of medication) has improved by at least 80% since the randomized trials of CEA *versus* medical treatment began. The observation of better outcomes now in patients with ACS without procedural intervention and its implications for patients with SCS (including the need for better patient selection and tighter peri-procedural stroke and death rate standards) have hardly impacted on guideline recommendations. Abbott *et al.* highlighted the over-reliance on, and limitations of, randomized trial data in current guidelines. Although randomized trials can be useful if well designed and interpreted without bias, they are not the Holy Grail of evidence-based medicine. Randomized trials can become obsolete, may be misinterpreted, are not usually the best way to evaluate outcomes in routine practice, and are not appropriate for answering all medical questions. Current guidelines often underutilize and undervalue quality, independently validated, non-randomized observational data. Such data, for example, have shown improved patient outcomes with medical treatment alone and with CEA, and a persistence of significantly higher risks from CAS. Abbott *et al.* also found fundamental organizational omissions and other problems across guidelines.1 For instance, of applicable guidelines for ACS and SCS, only 7% and 12%, respectively, completely defined carotid stenosis according to stenosis degree, the method of determining the stenosis, and the timing and territory of any previous stroke or TIA. Such definitions should follow directly from the relevant randomized trials. The lack of target population definition in guidelines encourages procedural over-utilization by not limiting endorsements to patient subgroups who clearly achieved a statistically significant benefit in those trials. In addition, guidelines were often accessible only via professional affiliations rather than popular search engines, were not self-contained, and included inconsistencies and ambiguities. They also often confused procedural recommendations for ACS and SCS, failed to include a fully defined procedural standard that would imply an overall patient benefit, and failed to explain limitations of guideline recommendations. Furthermore, the terminology used to summarize treatment recommendations and the evidence used in making them were not standardized across guidelines, making interpretation and comparisons difficult. It is, therefore, apparent that current international carotid management guidelines have serious flaws that may lead to suboptimal management of patients in routine practice. Standardization of recommendations would follow from objective and accurate interpretation of the evidence base. The numerous flaws in contemporary guidelines can only be explained by the differing and less than objective viewpoints of the individual physicians and sponsoring groups writing themand/or errors that their authors make. Future guidelines should acknowledge that new evidence, including further trials, may be helpful in improving outcomes for patients with carotid stenosis, and that such trials must include better risk stratification models and modern medical and procedural interventions. However, such trials will take many years to complete and may not address the problems discussed in Abbott *et al.*'s review. The question that remains is, can this situation be improved? The treatment of any condition will vary with different countries and areas of the world depending on local habits and resources. Therefore, a one size fits all guideline policy is probably not appropriate. However, future guidelines should acknowledge the flaws in the randomized trials that form their basis. They should also include other evidence such as propensity-matched trials (preferably multi-center), audited registries, and multi-registry analyses. The criteria on which guidelines should be based could be agreed on internationally and could include guidance of the acceptability of studies. For example, they could include guidance on such issues as: i) are the primary outcome end-points and randomization appropriate to the question asked, ii) is the study sufficiently powered, iii) are the evaluations contemporary; and iv) has the procedure been compared with other available treatments? After such agreements have been reached, it would be important that unbiased national organizations, which are not society based, could be asked to oversee guideline development and writing, and suggest treatment options for that country. Such organizations already exist in some countries. Some might say that this approach would be cumbersome and not ideal, but then neither is the present system. The key lesson learned from Abbott *et al.*'s review is that future guidelines should be written in a way that eliminates factual error, inconsistency, bias, and doctor self-interest, all of which can decrease guideline value. Only in this way will the interest of patients be better served. After all, facilitating improved patient outcomes in routine practice should be the main purpose of guidelines.

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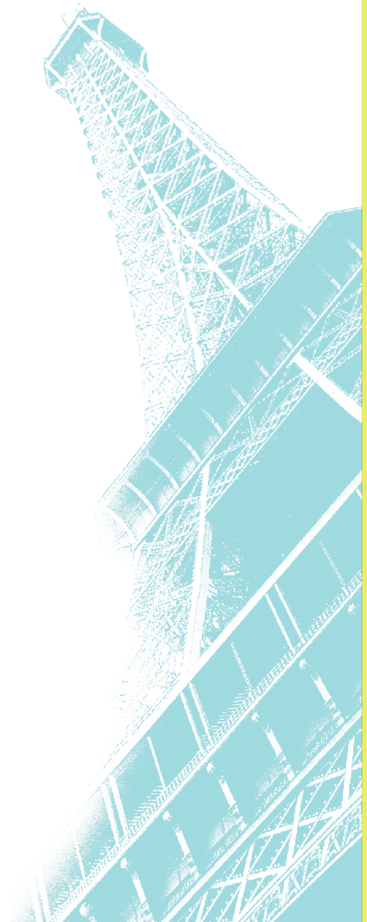

EVAR NEWS

Approaches.

How do you get acces from above: brachial, axillary, subclavian, conduit or multiple punctures? Right side or left side?

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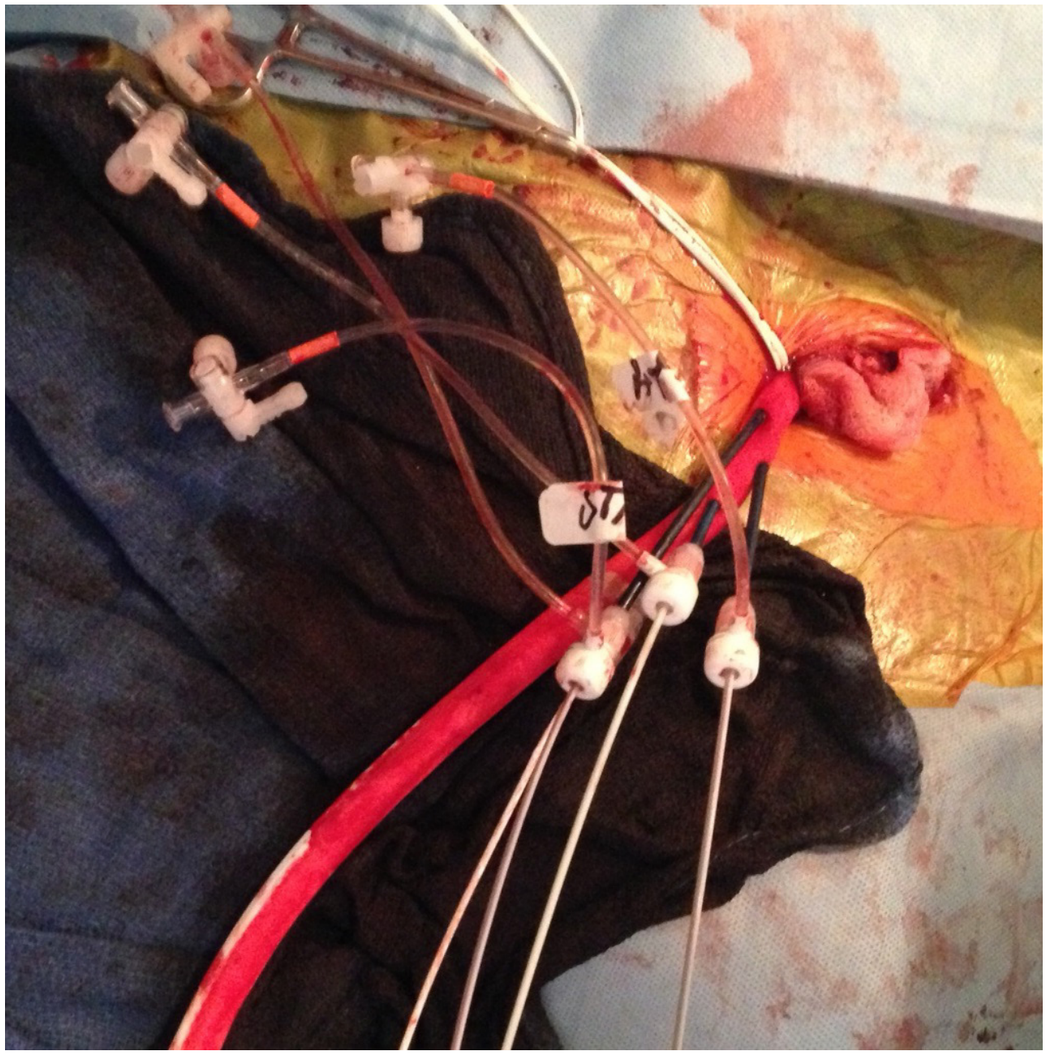
Pararenal abdominal aortic aneurysms remain challenging to treat from an open and endovascular approach. Endovascular approaches to this type of anatomy include Fenestrated endovascular aneurysm repair (FEVAR) and Chimney endovascular repair (ChEVAR) using parallel grafts. Both approaches have their advantages and disadvantages. A limitation of the ChEVAR approach is the need for upper extremity access in addition to the femoral access. This talk will address the risks and benefits of the different arterial access options to deliver parallel grafts. In addition, the need for one or more access will be discussed.

FIGURE
ChEVAR Access Image of axillary conduit with 4 separate sheaths on the right side.



ANEURYSMS OF THE ABDOMINAL AORTA

Short neck aneurysms.

Round table. How short neck AAA should be repaired

Not at all, F EVAR offers excellent immediate and long term results

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OBJECTIVES

Outcomes of fenestrated endovascular aneurysm repair (FEVAR) as a first-line strategy for patients with suitable pararenal aortic aneurysms.

MATERIALS AND METHODS

All consecutive patients treated with FEVAR for short-neck, juxtarenal, or suprarenal aortic aneurysms within the period January 2010 - December 2016 will be included. Data were collected from a prospectively maintained database. Analyzed outcomes included technical success, operative mortality and morbidity, target vessel patency, endoleak, re-intervention, and death. Survival, target vessel stent patency and reintervention during follow-up were calculated by KaplanñMeier analysis. Data were published for five years in the EJVES, and an update on seven years will be provided.

FIVE YEARS RESULTS

A total of 281 patients (245 male, mean age 72.1 ± 7.7 years) were treated. Mean aneurysm diameter was 60.2 ± 9.3 mm and median proximal neck length 2 mm (range 0-10mm). Technical success was 96.8% (272/281). Technical failure included one intraoperative death due to embolization and cardiac arrest, one open conversion due to iliac rupture, and seven target vessel complications. Thirty-day mortality was 0.7% (2/281). Mean follow-up was 21 ± 15.9 months. Estimated survival at 1 and 3 years was 94.7% ± 1.6% and 84.6% ±3.0 %, respectively. Estimated freedom from reintervention at 1 and 3 years was 96.1% ± 1.4%, and 90% ± 2.7%. Estimated target vessel stent patency at 1 and 3 years was 98.6% ± 0.5%, and 98.1% ± 0.6%, respectively. Mean aneurysm sac diameter decreased from 60.2 ± 9.3 mm preoperatively to 53.2±12.8 mm ($p<0.001$).

CONCLUSIONS

FEVAR as a first line strategy was associated with high technical success and low operative mortality rate. Efficacy and durability in the mid-term appear very good. Longer term results will be scrutinised carefully.

ANEURYSMS OF THE ABDOMINAL AORTA

Short neck aneurysms.
Round table. How short neck AAA should be repaired

Parralel grafts are the best option and can be standardized

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Juxtarenal aortic aneurysms (JAAs) pose significant challenges for endovascular aneurysm repair (EVAR). A short or absent infrarenal neck essentially exclude standard EVAR as a viable or reasonable treatment option. In this context, the use of chimney grafts (Ch-EVAR) is gaining in popularity and case applicability. These grafts are designed to course in the aortic lumen outside the main stent-graft, aiming to maintain normal arterial perfusion to the involved target vessels.

Ch-EVAR performed by off-the-shelf devices allows treatment in the urgent setting. Use of flexible devices such as the Endurant (Medtronic) stent-grafts overcomes barrieres of calcified, stenosed or elongated iliac arteries which represent a contraindication for use of fenestrated endografting. Additionally, the flexible nitinol endoskeleton and the short M-shaped stents of the Endurant show excellent comformability in angulated short necks. The technique is cost-effective.

In summary, Ch-EVAR with standarized use of flexible abdominal low profile devices and balloon expandable covered stents is safe and finally the best option for short necks.

ANEURYSMS OF THE ABDOMINAL AORTA

Short neck aneurysms.
Round table. How short neck AAA should be repaired

Why EVAS is the best graft for chimneys?

Ian Loftus
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OBJECTIVE

Chimney grafts may be placed parallel to an aortic stent-graft to maintain perfusion through visceral branches when treating juxta-renal and supra-renal aneurysms. Their use with conventional endovascular devices may be associated with risk of type 1 endoleak due to guttering. When used in combination with endovascular aneurysm sealing (EVAS), the risk of type 1 endoleak may be reduced because the polymer within the endobags conforms to the shape of the chimney stents, whilst maintaining a proximal seal. EVAS with chimney stents (ChEVAS) may represent an alternative to fenestrated EVAR (FEVAR) for the treatment of juxta-renal abdominal aortic aneurysms (AAA).

METHODS

We established a chimney- EVAS programme at St Georges London, in 2014, largely for patients unsuitable for open repair or FEVAR. Detailed pre-, peri- and postoperative physiological and aortic morphological data were collected for each patient undergoing ChEVAS. Clinical outcomes data were in keeping for endovascular therapies of the visceral aorta.

RESULTS

We have treated 62 patients thus far, comprising 14 women and 48 men. The mean age was 73 years. 10 aneurysms were suprarenal and 52 were juxtarenal, all were unsuitable for FEVAR or open repair. A mean of 1.58 chimney grafts were deployed per procedure; 34 cases (54.8%) involved deployment of 1 chimney, 20 (32.3%) 2 chimneys and 8 (12.9%) 3 chimneys). Mean polymer volume was 77.3 ml, with a median of 55 ml. Procedural technical success with an absence of endoleak at completion was demonstrated in 98% (61/62). There was one procedure-related death within 30-days. There was one type 1a and one type 2 endoleak in follow up.

An international registry (ASCEND Registry) is currently running in a number of centres, looking at the mid and long term outcomes of chimney-EVAS in 200 patients.

CONCLUSION

ChEVAS is an effective treatment for juxtarenal AAA, particularly for those patients with aneurysms unsuitable for FEVAR or those requiring urgent treatment. Mid to long term data on durability is important, especially in terms of branch patency, reintervention and aneurysm related mortality.

CAROTID

Risk of stroke and how to make a decision?

The keys to understanding stroke risk in asymptomatic carotid disease - Individual patient data meta-analysis of VA, ACAS and ACST-1 trials

Richard Bulbulia[1], Alison Halliday[2], on behalf of the ACST-1, ACAS, and VA collaborators, and the Carotid Stenosis Trialists' Collaboration[1]

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RATIONALE

Individual patient data analysis was conducted to clarify the efficacy and hazards of CEA in asymptomatic carotid stenosis patients, taking into account differences in medical therapy.

METHODOLOGY

Patients randomised in the VA trial (n=444, 1983-87), ACAS (n=1662, 1987-1993), and ACST-1 (n=3120, 1993-2003) were included in these intention-to-treat analysis. Primary outcomes were 30-day peri-procedural stroke and death rates (safety), and non peri-procedural stroke rates (efficacy). Pre-specified subgroup analyses were conducted based on age, sex, prior disease, and use of anti-thrombotic, anti-hypertensive and lipid-lowering medications (ie, triple medical therapy).

RESULTS

During the perioperative period, the risk of stroke or death was 3.0% among those who received CEA. However, following a successful procedure, allocation to immediate CEA halved the risk of stroke (12.4% *vs* 18.9%; RR 0.55 [95%CI 0.46-0.65], p<0.0001). Allocation to immediate CEA yielded significant reductions in both ipsilateral (RR 0.43 [95%CI 0.30-0.61]) and contralateral carotid territory strokes (RR 0.61 [95%CI 0.42 0.90]). Subgroup analysis of individuals taking triple medical therapy before any stroke demonstrated similar efficacy for CEA (8.2% *vs* 14.2%; RR=0.52 [95%CI 0.35-0.77], p<0.0001). There were no subgroup-specific differences observed based on participants' age (<75 years), sex, or prior disease.

CONCLUSION

CEA reduces the 10-year risk of stroke in asymptomatic patients, with significant reductions in both ipsilateral and contralateral carotid territory strokes. Contemporary medical therapy, in particular statins, reduces absolute stroke risk in this population, but addition of CEA halves the remaining risk.

CAROTID

Risk of stroke and how to make a decision?

Progression of asymptomatic carotid stenosis: is it a risk factor of stroke?

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Several natural history studies in patients with asymptomatic carotid stenosis (ACS) have investigated and confirmed the association between stenosis progression and risk of future ipsilateral cerebrovascular events. Sabeti studied prospectively 1065 consecutive patients with ACS, however only 376 of them were ≥50% (NASCET).[1] Carotid duplex was performed at baseline and after 6 to 9 months to identify patients with interval stenosis progression. Subsequently, patients were followed up clinically for a median of 3.2 years. The incidence of progression after a median of 7.5 months was 9% and the adjusted hazard ratio for stroke was 2.00 (95% confidence interval 1.02 to 4.11, P=.035). The authors concluded that progression of ACS within a 6- to 9-month interval detected by duplex predicts midterm clinical cerebrovascular events. In another cohort study, Conrad reported on 900 ACS in 794 patients, which were followed up with Duplex for a mean of 3.6 years (range 0.3-6.7 years).[2] Plaque progression occurred in 262 arteries (29%) and ipsilateral neurological symptoms developed in 13.7% (*vs* 8.5% for those without plaque progression, P=.02), although progression was not a significant predictor on multivariate analysis. The authors concluded that optimum medical treatment failed to prevent carotid disease progression or development of ipsilateral symptoms in 45% after five years of follow-up. The Asymptomatic Carotid Stenosis and Risk of Stroke (ACSRS) study (an IUA international multicentre natural history study) assessed the stroke risk stratification value of stenosis progression or regression using serial (6-monthly) duplex scanning.[3, 4] 1121 patients with stenosis of 50-99% ECST (in relation to the bulb) underwent 6-monthly clinical assessment and carotid duplex for up to eight years (mean follow-up: 4 years). Regression occurred in 43 (3.8%), no change in 856 (76.4%) and progression in 222 (19.8%) patients. During follow-up 59 ipsilateral strokes occurred; 40 (67.8%) of them occurred in patients whose stenosis was unchanged, 19 (32.2%) in those with progression and zero in those with regression. The eight-year cumulative ipsilateral cerebral ischemic stroke rate was zero in patients with regression, 9% if the stenosis was unchanged and 16% if there was progression (average annual stroke rates of 0%, 1.1% and 2.0%, respectively; Log Rank P=.05; relative risk in patients with progression: 1.92, 95% confidence interval 1.14 to 3.25). However, when stenosis progression when added as a covariate in a multivariate model alongside clinical (history of contralateral TIAs) and other ultrasonic featuresobtained after image normalization(GSM, DWAs and JBA) of plaque instability, it demonstrated a non-significant trend (P=.064). In conclusion, progression of ACS may identify a subgroup of patients with approximately twice the risk of ipsilateral events and stroke compared to those without progression. Further studies using current medical therapy may be suggested.

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CAROTID

Risk of stroke and how to make a decision?

Internal carotid artery near-total occlusions is it justified to operate on them?

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BACKGROUND

The condition of internal carotid artery near-total occlusion has been given various names like sub-occlusion, pre-occlusion, pseudo-occlusion, string sign, slim sign. The decision for revascularization in patients with near-total internal carotid artery (ICA) occlusion still remains controversial. The main reason is that patients with such angiographic findings were excluded from the recently contacted randomized trials (Carotid Revascularization Endarterectomy *versus* Stenting Trial [CREST] and International Carotid Stenting Study [ICSS]) on both symptomatic and asymptomatic patients. We undertook an extensive review of the literature and conducted a meta-analysis aiming to investigate the appropriate therapeutic approach for patients with near-total ICA occlusion.

METHODS

A multiple electronic health database search was performed on all articles published. All available data were analyzed giving emphasis on the applied therapeutic approach (best medical therapy [BMT], carotid endarterectomy [CEA], and carotid artery stenting [CAS]), whereas the main endpoints of the meta-analysis were transient ischemic attack (TIA), stroke, stroke-related death, myocardial infarction (MI), major adverse event (MAE), overall mortality, and restenosis.

RESULTS

Five articles on BMT and CEA, 8 articles on CEA, and 11 articles on CAS for patients with internal carotid artery near total occlusion were deemed eligible. A statistically significant difference was recorded in pooled stroke incidence rates (IRs) per 100 patient-years (p-ys) of BMT (IR = 6.19) compared with CEA (IR = 2.24, P = 0.002) and CAS (IR = 1.64, P < 0.001) studies. No statistically significant differences were recorded in pooled IRs per 100 p-ys between CEA and CAS, concerning TIA (P = 0.96), stroke (P = 0.44), stroke-related death (P = 0.30), and MAE (P = 0.99), whereas a borderline significance was recorded concerning overall mortality (P = 0.08) and restenosis (P = 0.08). No nominally significant effects were demonstrated with respect to almost all the studied potential modifiers in meta-regression analysis among the eligible studies.

CONCLUSIONS

The treatment of patients with internal carotid artery near total occlusion should be individualized and an intervention is probably indicated. The results of our study underline the need for including patients with near-total ICA occlusion in future randomized controlled trials.

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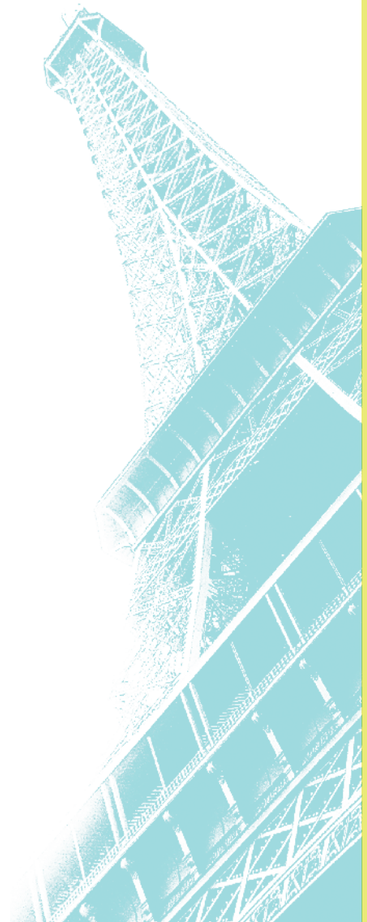

CAROTID

Risk of stroke and how to make a decision?

Carotid plaque morphology is only relevante to consider in symptomatic carotic stenosis

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Carotid plaque morphology has been shown to be associated with the risk of future ipsilateral stroke. However, most of the studies providing these data were performed before today's intensive preventive medications were recommended. Thus, it is unknown how much these medications affect the risk of these morphological factors.

First of all, the risk of stroke has declined in general, both in case of carotid disease and in general. Second, this decline probably affects the risk of both symptomatic and asymptomatic carotid disease and most data are available for asymptomatic cases. Here, the risk seems to have declined from 2.5-3% to maybe less than 0.5% per year. This would, naturally, increase the interest for identification of factors that could identify the few carotid lesions worthwhile treating invasively, in order to provide an effective treatment. However, considering the associated risk of intervention, i.e. 2-3% per year, in order to identify a group that would gain i.e. an annual absolute reduction in the risk of stroke, a subgroup with an annual risk of maybe 4-5%. We remain to see a validated method that can achieve this.

For symptomatic cases we have indications that the risk is still considerable. However, it may not be that high for all cases, i.e. once a certain time has passed, for females, moderate stenotic lesions etc. Under these circumstances, plaque morphology may identify the lesions of highest risk!

CAROTID

CEA results are the best ever why?

Delay between symptoms and interventions matters

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INTRODUCTION

The optimal timing for the performance of carotid intervention after the onset of symptoms has been revised several times in the last few years. The American Heart Association (AHA) guidelines recommended CEA for patients within 6 months of their most recent ischaemic neurological episode[1]. At that time, it was believed that: i) the risk of recurrent TIA or stroke early after a TIA episode was not high, ii) CEA should be delayed for 6ñ8 weeks after an ischemic stroke because of the increased risk of hemorrhagic transformation of the infarct, iii) operating early on a recently symptomatic unstable plaque was associated with an increased risk of perioperative stroke.[2] A subsequent analysis of pooled data from the ECST and the NASCET was a turning point I terms of understanding the optimum timing or intervention for recently symptomatic carotid artery stenosis.[3] Rothwell and colleagues demonstrated that sex (P=0.003), age (P=0.03) and time from the last neurological event to randomization (P=0.009) influenced the effectiveness of CEA to prevent recurrent strokes. The benefit from the operation was greatest in patients with 70ñ99% carotid stenosis randomized within 2 weeks of their last event (absolute risk reduction [ARR]: 23.0%) and fell rapidly with increasing delay (ARR at 2ñ4 weeks: 15.9%; ARR at 4ñ12 weeks: 7.9%; ARR after 12 weeks: 7.4%).[3] Rothwell *et al*. then analyzed the timing of recurrent cerebrovascular events in 2,416 patients who presented with an ischemic stroke following a preceding TIA using 2 populationñbased studies (Oxford Vascular Study and Oxfordshire Community Stroke Project) and 2 randomized trials (UK TIA Aspirin Trial and ECST).[4] This showed that the timing of preceding TIA was highly consistent, with 17% occurring on the day of the stroke, 9% on the previous day and 43% at some point during the 7 days prior to the stroke.[4] This observation was once again strikingly different from the belief held until then, i.e. that the early risk of stroke after TIA/minor stroke was only about 1ñ2% at 7 days and 2ñ4% at 30 days.2 It was also demonstrated that a surgeon who operates within 2 weeks with a 10% procedural risk would probably still prevent more strokes (in the long term) than a surgeon who delays intervening for 28 days and then operates with a 0% risk.[5]

CHANGES IN CAROTID INTERVENTION GUIDELINES

These observations led to the revision of the recommendation regarding the optimal timing for intervention in patients with TIA/minor stroke. The United Kingdom National Institute for Clinical Excellence (in 2008)[6] and the European Society for Vascular Surgery (in 2009)[7] both recommended the performance of CEA within 2 weeks of the last neurological event. The AHA[8] followed soon after, although the AHA recommendations were rather more controversial. The AHA guidelines recommended that "*when revascularization is indicated for patients with TIA or stroke and there are no contraindications to early revascularization, intervention within 2 weeks of the index event is reasonable rather than delaying surgery*".[8] Besides the fact that the "contraindications to early revascularization" were not defined, this was a weak (Class IIa; Level of Evidence: B) recommendation. Subsequently, a number of natural history studies showed that the risk of recurrent stroke is even higher earlier than 2 weeks in TIA patients with an ipsilateral 50ñ99% internal carotid artery stenosis. A study from Spain, for instance, showed that 20.9% of patients had a recurrent neurological event within the first 72 hours after their initial event, whereas 6.7% had a recurrent event between 72 hoursñ7 days and 3.7% between 7ñ14 days.[9] A similar study from Sweden showed that the incidence of recurrent stroke was 5.2% within 2 days, 7.9% within 7 days and 11.2% within 14 days.[10] Finally, a study from the UK looking into the reasons responsible for the delays prior to expedited CEA showed that although 85% of the patients underwent CEA within 14 days from their index symptom, 11% still suffered recurrent neurological events prior to surgery.[11] These results all point to the fact that the sooner CEA is performed after the occurrence of a TIA/minor stroke, the better it is in terms of prevention of recurrent strokes. The UK National Strategy for Stroke adopted an even more aggressive approach and

recommended that symptomatic patients should undergo CEA within 48 hours of symptom onset. This was despite any trial evidence in support of a 48ñhour threshold.

SAFETY OF PERFORMING CEA WITHIN 48 HOURS

One of the concerns relating to urgent CEA relate to perceived increased perioperative risk. A retrospective audit of 475 recently symptomatic patients undergoing CEA failed to find evidence that the procedural risk was higher when CEA was performed in the hyperacute period.[12] Overall, 41 of 475 (9%) patients underwent CEA within 48 hours of their most recent event, with a 30ñday death/stroke rate of 2.4% (1 of 41). The procedural risk in 167 patients who underwent CEA within 3ñ7 days was 1.8% (3 of 167 patients), whereas it was 0.8% in 133 patients who underwent surgery between 8 and 14 days (1 of 133). Other studies have provided similar results. However, conflicting results were reported from Sweden.[14] The Swedish Vascular Registry analyzed data for 2,596 symptomatic patients undergoing CEA and found that the combined stroke/death rate for patients treated 0ñ2 days after their qualifying event was 11.5% (17 of 148) compared with 3.6% (29 of 804), 4.0% (27 of 677) and 5.4% (52 of 967) for patients treated at 3ñ7, 8ñ14 and 15ñ180 days, respectively. By multivariate analysis, time was an independent risk factor for perioperative complications: patients treated 0ñ2 days after their qualifying event had a more than 4ñfold higher stroke/death rates compared patients undergoing surgery 3ñ7 days after their event (odds ratio: 4.24; 95% confidence interval: 2.07ñ8.70; P<0.001). The higher stroke/death rates for patients undergoing very urgent CEA were not verified in a recent study analysing 23,235 patients undergoing CEA between January 2009 and December 2014 from 100 UK hospitals in the National Vascular Registry.[15] This study showed that the median time from TIA/stroke to CEA decreased over time from 22 (interquartile range: 10ñ56) days in 2009 to 12 (interquartile range: 7ñ26) days in 2014, whereas the proportion of patients treated within 14 days increased from 37% to 58% during the same time. Performing CEA within 48 hours of symptoms was associated with a small increase in 30ñday stroke/death rates compared with performing CEA between 3 and 7 days (3.1% *vs.* 2.0%, respectively; odds ratio: 1.64; 95% confidence interval: 1.04ñ2.59), but not when compared with longer delays. The results from most studies therefore suggest that performing CEA within 48 hours is associated with an acceptable stroke/death risk, especially when considering the high recurrent stroke rates early after an initial event.

CONCLUSIONS

The observation that the risk of recurrent stroke is greater in the first few days after a neurological event has led to a progressive reduction of the recommended optimal timing to surgery. Although most current guidelines recommend performing CEA within 2 weeks of the most recent symptom, there seems to be a progressive shift to even earlier performance of surgery (i.e. within 48 hours). The majority of studies seem to suggest that performance of very urgent CEA is not associated with a significant increase in perioperative stroke/death dates. This observation further gains support when viewed in context of the very high risk of early recurrent neurological events after a first TIA/minor stroke. Best medical therapy (including dual antiplatelet therapy and highñdose statins) should be implemented as soon as a TIA is suspected and there is evidence that dual antiplatelet therapy started immediately may reduce recurrent events prior to expedited CEA without increasing perioperative bleeding complications. Expedited CEA is a safe and effective method to reduce recurrent stroke rates.

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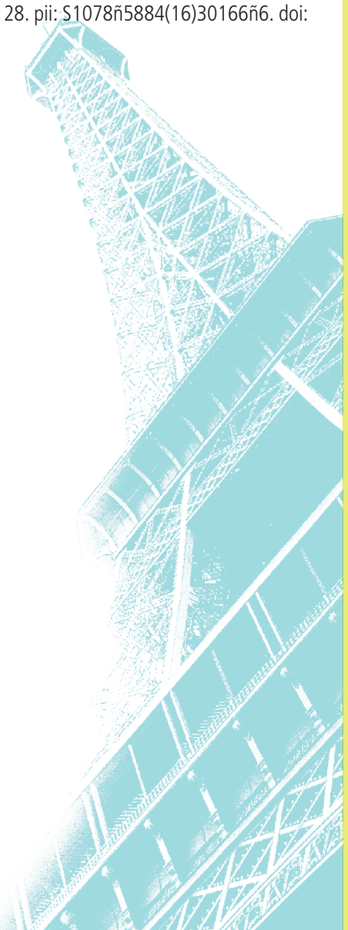

CAROTID

CEA results are the best ever why?

Do minimal incisions for CEA reduce peripheral nerves damage and P.O. strokes?

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PURPOSE

In the world of rapid development of endovascular procedures, open endarterectomy is still considered to be a golden standard [1,2,3,4].Three methods are accepted for carotid artery stenosis: endarterectomy with primary suture conventional thrombendarterectomy with carotid patch plasty, and eversion endarterectomy [5]. The aim of the study was to eveluate technical possibility, effectiveness, and safety of a small-incision carotid endarterectomy/SICE.

MATERIAL METHODS

Over 70 minimal invasive endarterectomies of internal carotid arteries were performed in the primary group. The majority of them were operated under local anesthesia [6]. Antiplatelet therapy was not interrupted.The incision of the length about 1,5-3,5 cm was made over the bifurcation of CCA. Usually, ECA was found as the first, however there were exceptions. Standard dose of 3000 U of NFH was administered. After hanging on the reins and releasing the posterior portion, the artery was closed and elevated. Longitudinal incisions of artery and classic endarterectomies were done. If there were no signs of brain ischemia, shunt were not inserted. The arteriotomy was closed with primery continous suture /except one case/. After that my team was divided into two groups: two of us did classic endarterectomy /CE/, and three of us did SICE. Between January 2015 and August 2016 we did 165 TEAs: 43-CE and 112-SICE.

RESULTS

In the first presented group of patients 3 (4,2%) postoperative strokes; one hemorrhagic, one ischemic, and one TIA were observed. In 2 cases there was a bleeding from the wound which needed a revision in the OR. In one case transient hoarseness appeared. Patients were usually discharged from the hospital one day after surgery. In the second group of patients there were three strokes in CE (6,9%, one hemorrhagic) and two strokes in SICE (1,9%) with no nerve damage. In the follow-up, doppler ultrasound was done three months after the surgery.

CONCLUSION:

Minimal invasive endarterectomy seems to be save and the number of complication do not differ our operation from the classic endarterectomies. Small operating injury gave a comfort to patients and allowed for quick discharging from hospital.

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CAROTID

Challenging carotid lesions

How to prevent surgical complications of carotid body tumor resection?

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Carotid body tumour (CBT) resection is associated with significant morbidity. In a metaanalysis of 67 articles which included 2,175 surgically treated patients, CBT resection resulted in 483 new cranial nerves permanent deficits (22.2%), 60 patients developed a permanent stroke (3%) and 26 patients died of postoperative complications (1.3%) [1].
Careful preoperative planning with cross sectional imaging (MRI or CT) demonstrates the Shamblin group, the status of the extracranial and intracranial circulation and the presence synchronous tumors either ipsilateral or contralateral. Imaging is critical to sound operative decision-making in the management of CBT, which may include replacement of the internal carotid artery. Excision of CBT and carotid artery reconstruction has a greater incidence of stroke (17.7%) and postop haemorrhage (43.1%) than excision alone (3.5% and 2.4% respectively) [2,3].

Traditionally the surgical procedure starts with subadventitial resection of the CBT from the carotid bifurcation and dissecting towards the cranial side with ligation of the caudally feeding branches of the external carotid artery [4]. It has been suggested that the reverse craniocaudal approach, that carries the advantage of identifying the adjacent nerves on the tumor's cranial side at an early stage, may prevent accidental damage in case haemorrhage occurs later during the operation and should be the surgical technique of choice [5].

Resection of CBT may be associated with significant per operative blood loss that obscures the view and contributes to the high incidence of cranial nerve injuries. Embolisation has been advocated as an effective method to reduce tumor vascularity and size, shorten the operative time and lessen the operative risk. A retrospective study in the USA using the Nationwide Inpatient Sample (2002-2006; 2117 patients), showed that CBT resection when combined with preoperative embolization (n=129) was not associated with an increased hospital stroke rate but the rate of postoperative haemorrhage or haematoma was not different from the excision alone group (n=1686) [2] A meta-analysis on the efficacy of embolization on the prevention of cranial nerve injury could not determine if preoperative embolization had any effect, as most published series did not discriminate between the subgroups undergoing preoperative embolization and open surgery *versus* open surgery alone [6].

There is now a growing body of evidence on the safety and efficacy of radiotherapy for the management of CBTs [1]. It should be the preferred approach for the management of very large CBT extending to the base of the skull, for patients who have contralateral cranial nerve injury, patients with recurrent tumors and patients with a short life expectancy.

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SPECIAL ISSUES: VASCULAR SURGEONS AT WAR

Endovascular management of acute aortic trauma

Sherif Sultan
Galway, Ireland

Traumatic thoracic aortic injury has an associated mortality of up to 8000 per annum and is a life-threatening surgical emergency.[1] The most common aetiology is rapid acceleration/deceleration injury sustained through motor vehicle accident, fall from a substantial height and/or blunt thoracic trauma. The mortality rate is considerable and only 10-15% of patients reach the hospital alive.[1]

Open surgical repair was first successfully undertaken in 1959 and since then it has remained the standard treatment option. However, the less invasive and more expeditious treatment options of thoracic endovascular aortic repair (TEVAR) has overtaken open surgical repair in the majority of cases. TEVAR, with or without chimney grafting of the left subclavian artery is associated with favourable early outcomes but long term durability, especially in younger patients, remains unproven with concerns over device integrity and re-intervention at the forefront of concerns. As with most life-threatening emergency situations randomised controlled trials (RCTs) are highly challenging both practically and ethically. Therefore level-one evidence is lacking to support the superiority of the endovascular approach compared to open repair. Furthermore there is no definitive proof of the need for chimney grafting to preserve left subclavian and vertebral artery flow, although series reports demonstrate preferred outcomes in terms of a reduction in neurological and upper ischemia events at least in the short to medium term.

Results from multicentre non-randomised trials such as the Rescue trial[2] and the TAG 08-02 clinical trial investigator[3], each recruiting 50 patients demonstrate technical success rates of 100% with no neurological events and survival rates of 92% at 30 days and 88% at one year. European multinational trials with longer term follow-up are demonstrating long-term durability over a decade. They report 5 year survival rates of 81% and re-internvetion rates of 16%, half of which are required with the first month.[4]

Even in the absence of RCTs TEVAR is becoming the current standard in treatment of acute thoracic aortic injury on the basis of meta-analyses and large multi-centre clinical series. Outcomes are life-saving and sustainable.

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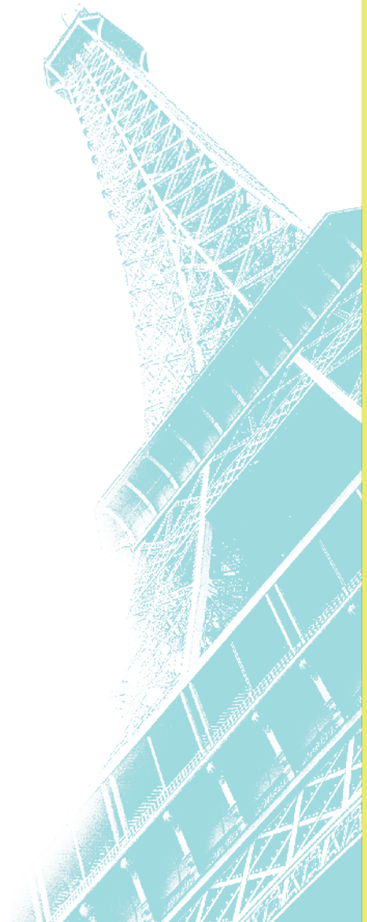
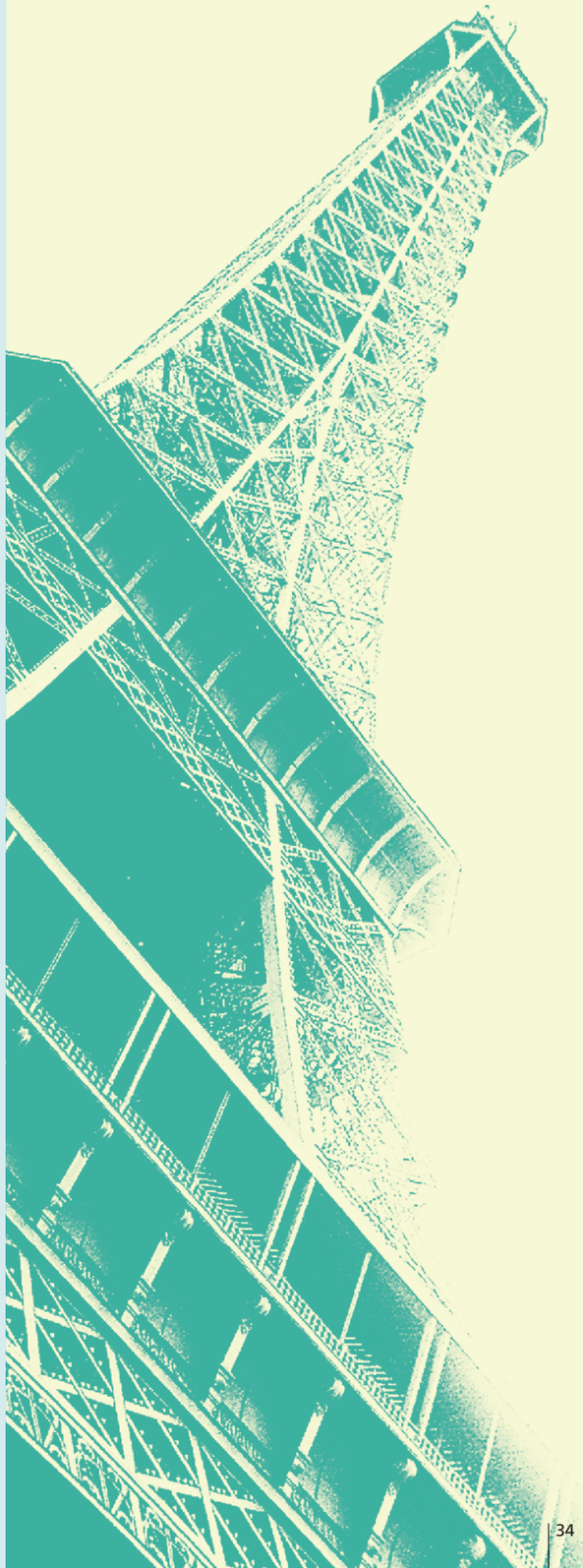




FRIDAY JANUARY 20

HEMODIALYSIS ANGIOACCESSES

AVF CREATION – NATURAL HISTORY

Ulnar-Basilic AVF

Julien Al Shakarchi, Nicholas Inston
University Hospital Birmingham, Birmingham, United Kingdom

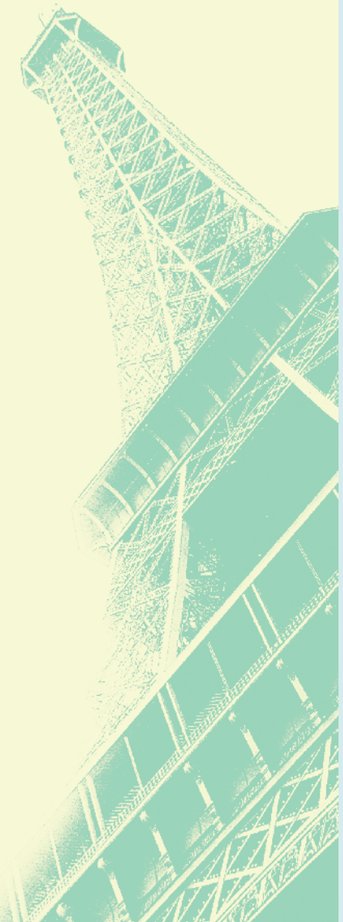
The fistula first initiative has promoted arteriovenous fistulas (AVF) as the vascular access of choice. To preserve as many future access options as possible, multiple guidelines advocate that the most distal AVF possible should be created in the first place. Generally snuff box and radio-cephalic are accepted and well described sites for AVFs however the forearm ulnar-basilic AVF is seldom used or recommended. The aim of this study was to assess and systematically review the evidence base for the ulnar-basilic fistula and to critically appraise whether more attention should be given to this site.
Electronic databases were searched for studies involving the creation of ulnar-basilic fistulas for dialysis in accordance with PRISMA guidelines. The primary outcomes for this study were 1-year primary and secondary patency rates. Secondary outcomes were rates of haemodialysis access induced distal ischaemia (HAIDI) and infection.
Following strict inclusion/exclusion criteria by 2 reviewers, eight studies were included in our review. Weighted pooled data showed 1-year primary patency rate for ulnar-basilic AVFs of 53.0% (95% CI: 40.1-65.8%) with a secondary patency rate of 72.0% (95% CI: 59.2-83.3). HAIDI and infection rates were low.
Our review has shown that the ulnar-basilic AVF may be a viable alternative when a radio-cephalic AVF is not possible and dialysis is not required urgently. It has adequate 1-year primary and secondary patency rates. Whilst it may be a surgical challenge due to the small size of vessels, a microsurgical technique with the use of a microscope or magnifying loupes can overcome this.

AVF CREATION – NATURAL HISTORY

AVF and surgical microscope in adults

Marek Rawa
Polyclinique "Zerhoun", Meknes, Morocco

Surgeons in multiple specialties (neurosurgery, hand surgery, plastic surgery, ophthalmology, laryngology and even dentistry) have adopted the surgical microscope.
Nowadays, it would be inconceivable to operate a cataract, perform tympanoplasty, complete a free tissue transfer flap, or re-attach a severed hand or finger without the use of a surgical microscope.
In context of vascular surgery, the first article on the use of the microscope in children was published in 1981.
The results were so good that one would have expected them to encourage the use of microscope in adults as well.
Today, some thirty-seven years later, surprisingly, too many surgeons still perform AVF without using a microscope.
In this paper the author describes the benefits that come from using the surgical microscope to practicing vascular access.
In addition, and based on his experience, he author seeks to understand why many surgeons refrain from using the microscope.
It would seem that these reasons are subjective, since objectively, in seeing better one can only expect to operate better.



AVF CREATION – NATURAL HISTORY

AVFs natural history

Teun Wilmink
Dept of Vascular Surgery, Birmingham, United Kingdom

OBJECTIVES

to study primary failure, maturation times, and survival of common arteriovenous fistulae (AVF) to aid planning for vascular access, and to assess which strategy results in most dialysis days.

METHODS

This was a longitudinal cohort study. Two databases of access operations and dialysis sessions over 9 years with 12-year follow-up were reviewed. Functional dialysis use is defined as achieving six consecutive dialysis sessions with two needles on AVF. Primary failure (PF) is failure to achieve functional dialysis use. Maturation time, calculated only for patients on dialysis with a central line at AVF operation, is defined from the operation date to the functional dialysis date. Cumulative patency, including PF, is calculated from the operation to date of AVF abandonment and is compared using Kaplan–Meier curves and adjusted hazard ratios (HRs).

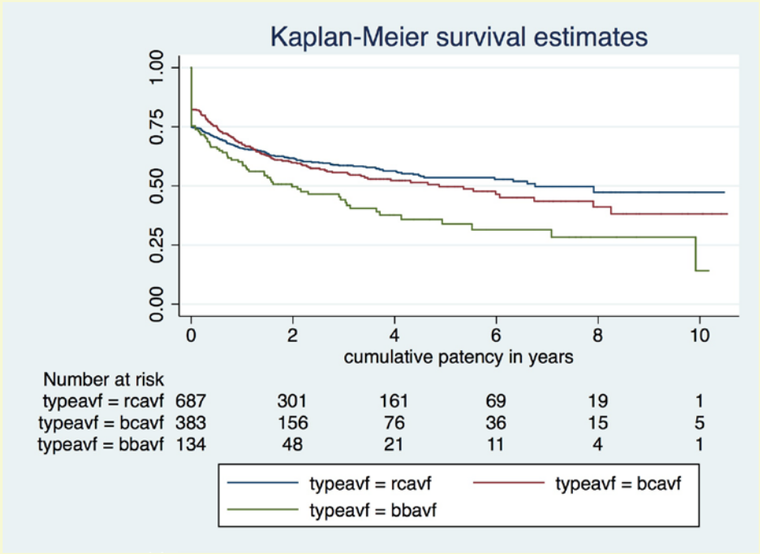
RESULTS

A total of 1206 AVF, 689 (57%) radiocephalic AVF (RCAVF), 383 (32%) brachiocephalic AVF (BCAVF), and 134 (11%) brachiobasilic AVF (BBAVF), were analysed. PF was 23%. PF was lower for BCAVF (17%) than RCAVF (26%) and BBAVF (26%) (p = .006). PF was higher for women (OR 1.59, 95% CI: 1.21–2.09) and patients with vascular kidney disease (OR 1.69, 95% CI: 1.19–2.59). Median maturation time was 10.3 weeks. Cumulative patency was worse for BCAVF (HR 1.36, 95% CI: 1.03–1.81) and BBAVF (HR 1.63 95% CI: 1.12–2.38), for patients on dialysis at AVF creation (HR 1.55, 95% CI: 1.13–2.12), and diabetics (HR 1.55, 95% CI: 1.12–1.85). RCAVFs resulted in 3% more dialysis-person-years per 100 operations (figure 1) for all patients and in 15% more dialysis- person-years in the over 80s (figure 2).

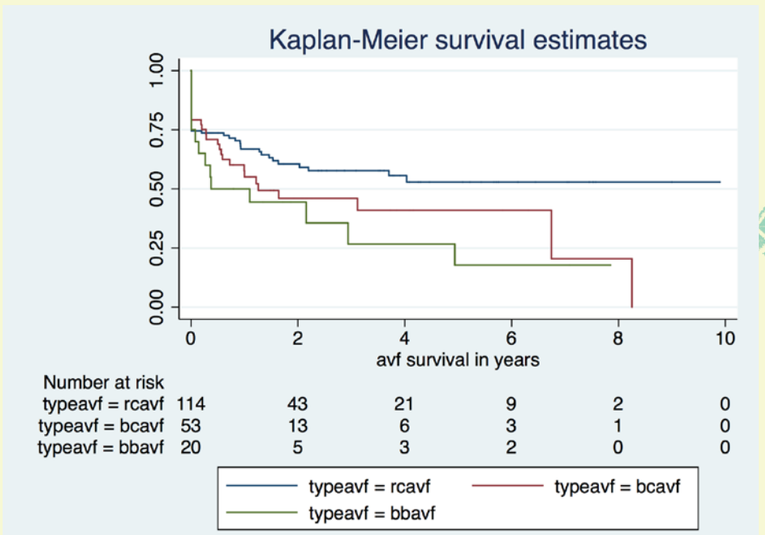
CONCLUSION

RCAVFs have higher PF, but better survival than other AVF, and result in more dialysis time. AVF created pre-dialysis have much better survival. An average maturation time of 10 weeks should be considered if planning to start dialysis on an AVF.

FIGURES



cumulative patency all AVF by type AVF



Cumulative patency of AVF created in patients over 80 by type AVF

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AVF CREATION – NATURAL HISTORY

Controversy. Pediatric vascular access

In London

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Effective paediatric vascular access is vital in maintaining a child's health until renal transplantation is possible. Careful assessment, family commitment and a multidisciplinary approach is fundamental to maintaining a dialysis program based on arteriovenous fistulae.
We present the "London Experience" of managing children on haemodialysis with arteriovenous fistulae.

PTA

Controversy. US or angiography guided PTA

Using US and angiography is more efficient

Jose Garcia-Medina[1], Juan Jose Garcia-Alfonso[2]
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2. Faculty of Medicine, Murcia, Spain

Angioplasty is the preferred treatment for vascular access (VA) stenosis [1]. Corrective treatment, combined with monitoring the VA for hemodynamically significant stenoses, could improve patency and reduce the incidence of thrombosis [2]. It has been clearly demonstrated the efficacy of correcting a stenosis with angioplasty under fluoroscopy guidance, restoring the laboratory parameters used to detect it. Most recently data show how PTA under Color Doppler ultrasonography (CDU) is useful to maintain and to improve VA patency [3]. This PTA under CDU guidance allows patients to avoid adverse reactions to contrast media [4]. Ultrasound is also a feasible and useful tool in the management of thrombosed native fistulae, thus decreasing radiation exposure, and has no detrimental effect on success rates (5). Although ultrasound has numerous advantages, it is not without disadvantages [5]. For example, in brachial-cephalic fistulae, visualizing the passage through the cephalic arch in cases of severe stenosis may require the assistance of fluoroscopy. A similar difficulty occurs when passing from the vein into the artery through the anastomosis. The presence of stenoses between aneurysmal dilatations may be difficult to cross by ultrasound control because the guidewire easily coils into the aneurysm. A further disadvantage is the need for close coordination between the operator and assistant because more than two hands are needed to perform the procedure. In conclusion, we believe that it is more efficient to use fluoroscopy and ultrasound together to treat VA stenoses. Our purpose in this presentation is to report the feasibility, safety, and effectiveness of duplex ultrasound guidance as an adjunct to fluoroscopy and angiography in the treatment of dysfunctional dialysis fistulas.

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PTA

Patient safety in vascular access planning and construction

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Patient safety refers to the absence of medical errors in health care systems. Adverse events occur when the patient is harmed by medical management. Adverse events caused by an error are by definition "preventable adverse events". Beyond their economic cost, medical errors cause loss of trust in both the caregiver and the healthcare system.[1]

Many interventions that are applicable in vascular access surgery are not costly and have a positive effect on patient safety outcome. Some examples are use of safety checklists, adherence to a care pathway, team training, and sub-specialization in access surgery.

Patients can and should be major contributors to their own safety, and as such, physicians should develop a new approach to involve them in the cycle of decision making through every step of their treatment. The patient has to be empowered in order to gain the confidence to carry out safety-related behaviors. Without empowerment, hemodialysis patients will never be able to take an active role in improving the safety process. The natural paternalistic attitude of health care workers that "the doctor knows best" is the major barrier that needs to be overcome in order to increase patient involvement.[2]

There are many opportunities along the treatment path for the patient to be engaged in safety behaviors and for the access team to ensure such behaviors by employing simple strategies. The advent of the access center, based on multidisciplinary teamwork, has enhanced the potential to improve patient safety by prevention of errors in planning and performing access surgery, avoiding delay in treatment of access malfunction and improving communication between the team members.

Our access center algorithm of patient safety enhanced access planning starts at the first meeting with the patient, continues through the decision making process until the patient is scheduled for surgery, and includes post-operative care and follow up. The ultimate aim is the reduction of preventable errors and increasing patient safety by systematic assessments of patients and risk factors in all stages of the care pathway.[3]

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SURVEILLANCE – ENDOVASCULAR CREATION

Doppler ultrasound: is it a third generation AVF surveillance method?

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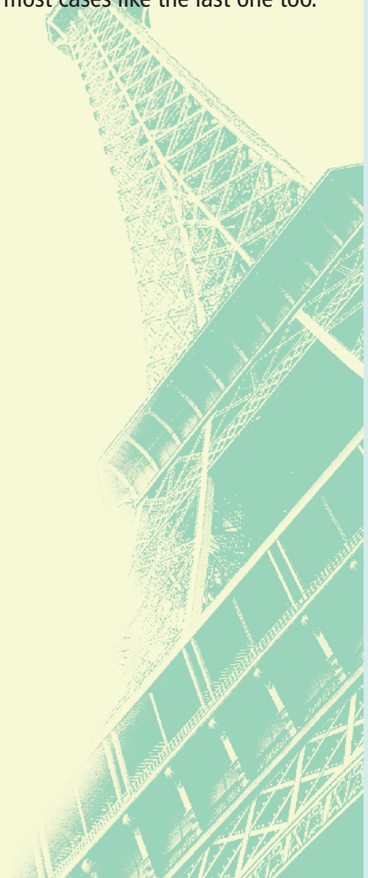
Vascular Access (VA) complications produce high morbi-mortality, worsened quality of life, hospitalizations and costs. Screening of pathology with the first generation methods (urea analysis, recirculation, hemodialysis device alarms, physical examination, etc) is very specific but may be no sensitive. That it means that in this way pathology is usually late diagnosed and VA can be loosed. Second generation methods are VA flow determination. The techniques used are based either on dilution methods or on Duplex UltraSound (DUS) examination which associates Doppler and Echography. But DUS was usually reserved for selected patients and depends on its availability. DU has the advantage of flow measurement and image study in the same examination.

Latest evidence advices using DUS examination for surveillance of flow and diagnosis of pathology, with angiography only for selected cases. The possibility to incorporate DUS in the Hemodialysis Unit with portable devices, has made possible the pathology screening and its precise diagnosis in the same act, giving the possibility not only to do flow screening but to image-control stenosis, masses and collections or to determine confusing or alternative collaterals.

Working in a multidisciplinary approach protocol with all the specialties involved, allows treatment prioritization depending on the flow rate and thrombosis risk; or dangerous pseudoaneurysms. It allows for treatment orientation to surgical, interventional or even conservative approach and even mapping for the next VA placement. Finally, the possibility of the US guided puncture mainly in the deep vessels or in pathological VA waiting for treatment, is a fundametal progresss. All this create a new concept, the US as a third generation method that can be used in the first approach and in most cases like the last one too.



COMPLICATIONS – GUIDELINES

Management of PTFE seromas

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Montefiore Medical Center, Bronx, NY, USA

Perigraft seroma formation is related to the synergism of biochemical, mechanical and structural factors. Seromas can be caused by excess graft porosity, exposure of grafts to caustic agents, immunologic or biochemical factors and possibly by heparin exposure, use of nonsheathed tunnelers or other factors. ePTFE is composed of nodes and fibrils with 80% void spaces filled with air. When the air in the void space is rapidly displaced all ePTFE grafts will persistently leak fluid. Ideally an implanted graft should have air displaced over 24-48 hours by body fluids with migration of fibroblasts into the interstices and deposition of collagen. Immediate ultrafiltration through a vascular graft can be caused by premature "wetting" of the graft with organic solvents or fat, which hinders the process of graft sealing. This process is affected by hemodynamic factors such as flow rate, blood pressure, oncotic pressure, alcohol or povidine-iodine contact or excess graft manipulation. Forcibly irrigating solutions through the graft wall can also cause immediate ultrafiltration. Potential complications of untreated seromas include infection, wound dehiscence, skin necrosis, graft thrombosis or loss of available puncture sites.

The overall incidence of dialysis access graft seromas ranges from 0.48% to 4.2%. Age, gender and diabetes do not affect incidence but there is a statistically significant difference in incidence between upper arm and forearm grafts. Observation without intervention may suffice for small seromas. When intervention is indicated, management strategies have included percutaneous drainage, open surgical treatment with excision of the seroma capsule and replacement of the involved graft segment usually with alternative graft materials and deployment of covered stents in the involved segment of graft. Strategies for management of intraoperative serous ultrafiltration through the graft wall include graft replacement usually with alternative graft materials or application of topical thrombin or fibrin glue which has been of limited success. Overall prevention and management of ePTFE seromas remains challenging. Use of biologic or multilayered early stick grafts should significantly reduce the incidence of these complications.

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COMPLICATIONS – GUIDELINES

Digital pressure measurements for HAIDI

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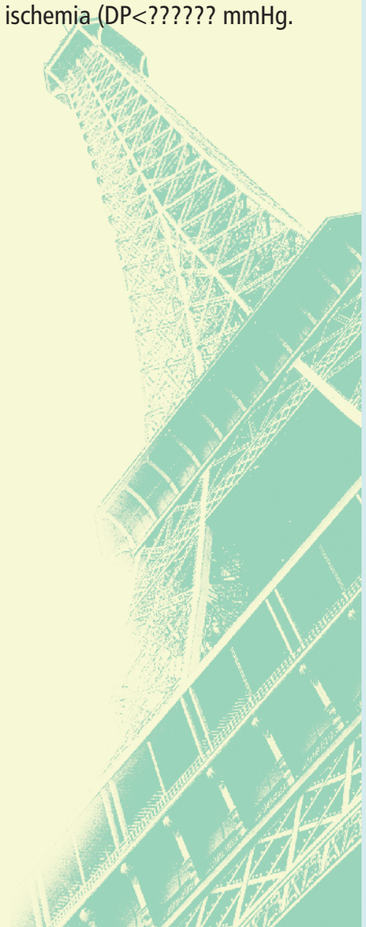
Hemodialysis access-induced distal ischemia (HAIDI) is due to the diminution of perfusion pressure in the presence of the low resistance arteriovenous fistula (AVF). More than steal which is common, associated arterial stenotic lesions increase distal hypoperfusion resulting in hand ischemia. Various clinical grades are observed in few patients (from 1 to 20%) shortly after access construction, or later on. Diagnosis predominantly based on clinical findings sometimes remains unclear and digital pressure measurements are helpful to confirm and to evaluate the severity of ischemia. Arterial digital pressure (DP) is recorded in the third finger ipsilateral to the AVF by digital photoplethysmography (PPG) and compared to the opposite arm. Basal digital pressure (BDP), digital brachial index (DBI), change in digital pressure with access compression (CDP) must be measured. BDP less than 60 mmHg or a DBI less than 0.4 are highly associated with hand ischemia. CDP less than 20% may be useful in identifying patients with ischemia who could benefit from an access flow reduction. Preoperative assessment of the efficacy of distal radial artery ligation in treatment of distal fistula HAIDI is easy by comparison of BDP measurements before and after occlusion of the radial artery. Digital pressure measurements prior to AVF construction should be part of evaluation of upper-extremity perfusion to avoid HAIDI. Ability of the DBI to evaluate the risk of HAIDI has been somewhat controversial but for many authors DBI <0.6 identifies correctly patient at risk. Allen 'test classically evaluate patency of palmar arch. A quantitative version using PPG under radial artery compression can be done. This is particularly interesting to test the ability of ulnar artery and palmar arch to supply the hand. If finger pressure drops below 80 mm Hg or if there is a more than 30% drop the test is abnormal and emphasizes the risk of HAIDI. Furthermore knowing BDP and that AVF construction is followed by a mean pressure drop of 30 mm Hg it becomes easy to evaluate the risk of postoperative ischemia (DP<?????? mmHg.



COMPLICATIONS – GUIDELINES

CONTROVERSY. Guidelines should be international and based on solid evidence and not take into account local ressouces or availabilities.

Yes

Jan Tordoir
MUMC, Maastricht, The Netherlands

Many decisions around vascular access (VA) for hemodialysis (HD) warrant a collaborative decision-making process. The goal of guidelines is to summarize and evaluate all the current available evidence to assist physicians in selecting the best management strategies for patients needing a VA or for pathologies derived by VA. Each physician must make the ultimate decision regarding the particular care of an individual HD patient.

HD patients with VA are complex and subject to significant clinical practice variability, although a valid evidence base is available to guide recommendations. The significant technical and medical advances in VA have enabled guidelines to be proposed with greater supporting evidence than previously. However, many clinical situations involving patients have not been subjected to randomized clinical trials. By providing information on the relevance and validity of the quality of evidence, the physician will be able to gather the most important and evidence-based information relevant to the individual patient.

These limited randomized studies especially involves arteriovenous fistulae (AVF), and the small sample size of the published studies with conflicting results highlight the need for larger multicentered randomized study with hard clinical end points to evaluate the optimal strategy for both AVF and arteriovenous grafts (AVG).

Randomized studies can be performed on a national and/or international level, but might be flawed by insufficient number of included patients and inadequate power analysis. Larger patients cohorts are available in countries with access to greater number of HD patients and/or national patient data sets (for instance www.usrds; www.renalreg.org). These facts warrant the need for international guidelines. Drawback might be differences in patient demographics between countries, which can influence study outcomes. In addition, different attitudes to the creation and maintainance of vascular access, may reflect national preferences in the field of VA for hemodialysis.

COMPLICATIONS – GUIDELINES

Radial artery transposition for flow reduction

Pierre Bourquelot
Clinique Jouvenet, Paris, France

OBJECTIVE

All surgical methods published to date for the reduction of excessive high-flow in native elbow fistulas for dialysis have limitations [1-9]. We report a new surgical approach to flow reduction by transposition of the radial artery to the elbow level (VIDEO).

METHODS

47 consecutive patients (Table 1) (22 women) with brachial artery to elbow vein autogenous fistula underwent flow reduction via replacement of brachial artery by transposed distal radial artery inflow (Fig 1, 2). The new arteriovenous anastomoses were end-to-side either brachial-cephalic (n=19) or brachial-basilic (n=28). The indications were hand ischemia (n=4), cardiac failure (n=13), concerns about future cardiac dysfunction [10] (n=23), and chronic venous hypertension resulting in aneurysmal degeneration of the vein (n=7). Mean patient age was 44 years (range, 3-82) (7 < 16 years) 11% were diabetic, 17% were smokers, and mean BMI was 22. Mean fistula age before flow reduction was 2.5 years.

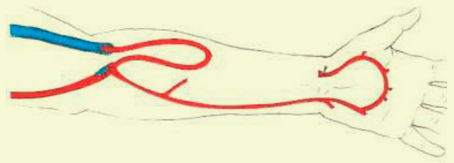
RESULTS

Technical success was 91% (n=43 of 47). The mean flow rate dropped by 66% ±14% (Table 2). Clinical success in symptomatic patients was 75% (n=18 of 24). The fistula eventually had to be ligated in 3 cases of cardiac failure because of insufficient clinical improvement. All 4 patients with hand ischemia were cured, with no recurrence during follow-up. Primary patency rates at one and three years were 61% ± 7% and 40% ± 8%. Secondary patency rates at 1 and 3 years were 89% ± 5% and 70% ± 8%. (Fig 3-4-5)

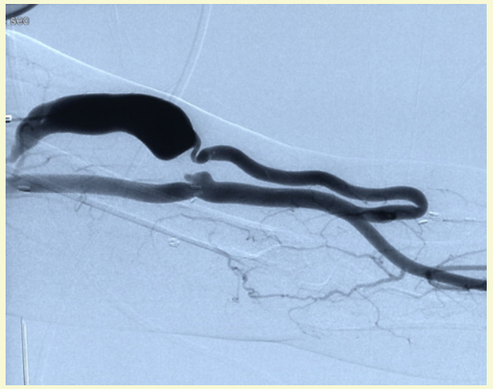
CONCLUSION

Transposition of the radial artery, a safe and effective technique, might now be considered in the surgical armamentarium of flow reduction techniques.

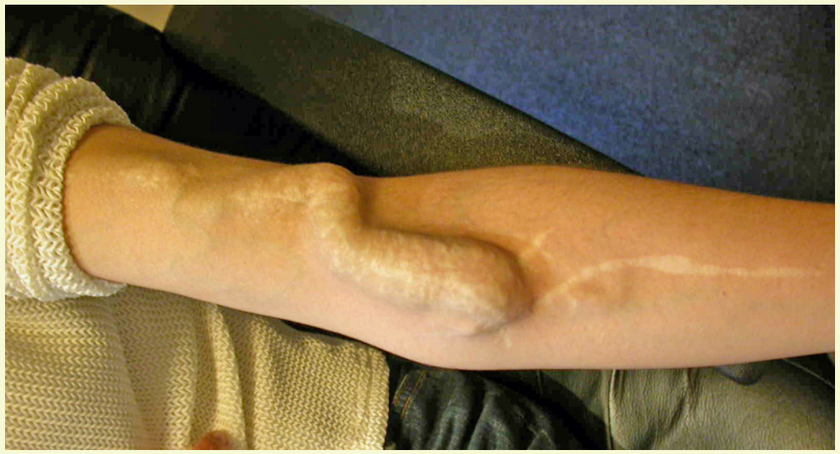
FIGURES



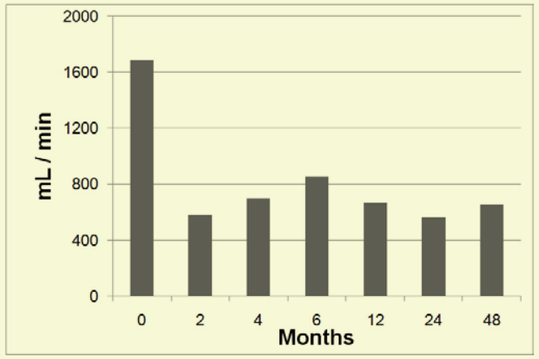
Operating diagram



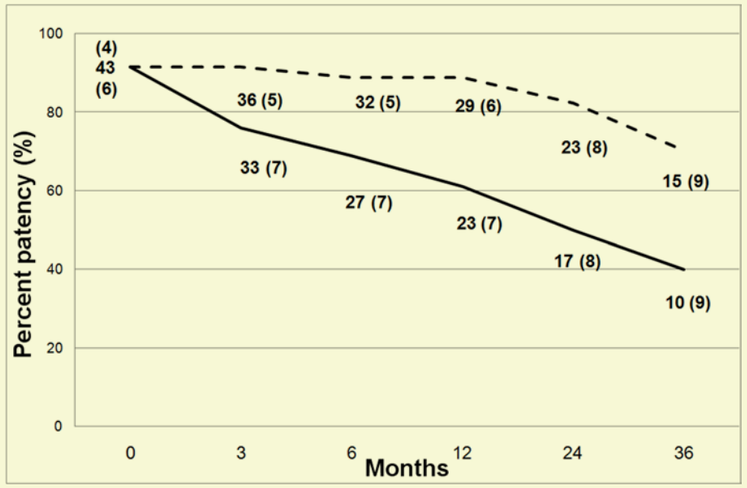
Postop. angiography



Three years later after kidney transplant



Flow reduction up to 4 years



Primary and secondary patency rates, standard errors, and numbers of patients at risk (between brackets) at the start of each interval

TABLES

Patients	47
Age of patients (years)	44 ± 21 (range: 3 - 82), (7 < 16 years)
Males/Females	25/22
AVF type	Brachial-Cephalic: 19
	Brachio-Basilic: 28
Age of AVF (years)	2.5 ± 2.1 (range: 8.9 - 0.1)
Diabetics	5
Smokers	8
Hypertension	24
BSA (m^2)	1.54 ± 0.41 (range: 0.46-2.10)
BMI	22 ± 5 (range: 14-33)
Indications for flow reduction	Ischemia: 4 (finger gangrene: 3, rest pain: 1)
	Cardiac failure: 13
	Regarding cardiac outcome: 23
	Venous hypertension: 7

Patients

Flow	Preoperative	Postoperative		
	mL/min	mL/min per 1.73 m^2	mL/min	mL/min per 1.73 m^2
Mean	1681	2012	577	678
SD	499	742	310	416
Max	3000	4554	1900	2569
Min	800*	919	170*	234

* Child of 10 kgs: preop- flow = 2993 mL/min per 1.73 m^2.
Pre and post operative mean flow

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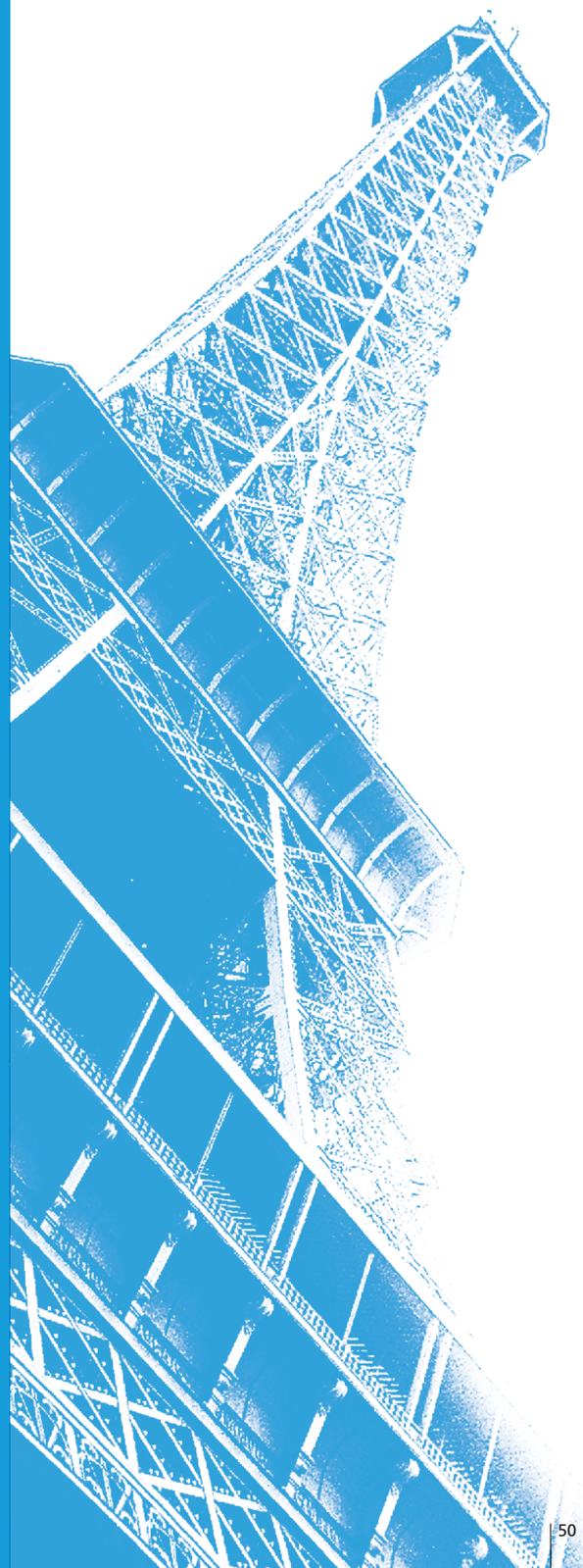

SATURDAY JANUARY 21

– MAIN PROGRAM –

OCCLUSIVE DISEASES OF THE LIMB

Aorto Iliac segment.

Tricks to achieve endovascular repair of totally occluded iliac arteries

Ali Amin

Reading Health System, Reading, United States

Atherosclerosis in its various forms is the leading cause of mortality and disability throughout the world. Peripheral arterial occlusive disease (PAD) is primarily a disease of the elderly population, especially those over the age of 65. The prevalence of symptomatic PAD is estimated at approximately 2% in all individuals between 40 and 60 years of age, and up to 6% in those over 70. However these figures are much higher if objective noninvasive tests such as ankle-brachial index (ABI). Based on a disease definition of ABI of. 9 or less, the Edinburgh Artery Study reported a disease prevalence of 17% in a population aged between 55 and 74 [1,2]. Any treatment regimen targeted for PAD must address four objectives: 1. Improvement of functional capacity with improvement of walking distance, 2. Prevention of limb loss, 3. Modification of the atherosclerotic process in the diseased segment, 4. Reduction of cardiovascular morbidity and mortality. Intermittent claudication is one of the most reliable symptoms of vascular insufficiency. Although typically involves the calf muscles, patients might complain of claudication involving the buttocks or thigh. Buttock and thigh claudication suggest stenosis or occlusion of the iliac artery. If symptoms are bilateral, then it is usually associated with aortoiliac stenosis or occlusion. In the male this may be associated with impotence and this is known as Leriche syndrome. Progression of the claudication suggests that the atherosclerotic process is progressing and intervention may be necessary before tissue loss occurs. When claudication progresses to ischemic rest pain, tissue loss is almost inevitable unless the limb is revascularized. Rest pain occurs when blood flow has decreased to such a critical level that there is tissue ischemia, even at rest. In the past 10 years the treatment of vascular disease had changed greatly. Technologic advances have fueled an interest in the minimally invasive therapy for peripheral vascular disease. Percutaneous techniques utilizing balloon angioplasty, stenting, atherectomy, laser, cryoplasty have provided various methods to revascularize ischemic extremity. Although the durability of these methods have been questioned by vascular surgeons, recent literature does show significant improvement in their success and durability. Looking back, the introduction of percutaneous transluminal angioplasty by Dotter and Judkins in 1964 heralded a new era in the treatment of vascular diseases [3]. The method was met by a great deal of skepticism and even scorn by some surgeons. However, experience has shown it to be an acceptable method of treatment, particularly for stenosis in the aortoiliac area where the long term results appear to be nearly equal to those obtained by surgical means. The method became more widely applied following the introduction of the balloon catheter by Gruntzig and Hopff in 1974 [4]. Over the past few years, there have been considerable advances in the management of patients with severe aortoiliac occlusive disease. Although aortobifemoral bypass graft has been the standard treatment for severe aortoiliac occlusive disease, with 5 year patency of approximately 90-95% [5], but associated with higher morbidity and mortality compare to minimally invasive angioplasty and stenting. This is particularly important when treating elderly patients with multiple co-morbidities. Although extra-anatomic bypasses provide less invasive method to revascularize aortoiliac occlusion, their patency is close to percutaneous endovascular intervention with good result and less morbidity. Over the past few years, development of new Nitinol stents, lower profile but higher pressure balloons, and use of re-entry devices have changed the landscape for treatment of more complex iliac lesions including iliac artery occlusion. In a series of 212 patients with chronic iliac artery occlusions, successful recanalization was accomplished in nearly 90%, with nearly all patients showing with marked clinical improvement. Primary patency at 4 years was 76% and secondary patency of 85% [8]. The original comprehensive report of the TransAtlantic Inter-Society Consensus (TASC I, 2000) on the management of peripheral artery disease (PAD), included morphological stratifications of aortoiliac lesions with associated recommendations for initial treatment [6]. Lesions in the aorto-iliac segment have been categorized according to their location, extension, and morphology (stenosis *vs.* occlusion) with implications of their treatment. In 2007, TASC II report updated the morphological stratification and revascularization recommendations for aortoiliac lesions including morphological stratification and revascularization recommendations [7]. In general, each lesion category in the new TASC II morphological stratification includes more severe disease than in TASC I. Endovascular therapy is the treatment of choice for type A lesions and surgery is the treatment of choice for type D lesions. Endovascular treatment is the preferred treatment for type B lesions and surgery is the preferred treatment for good risk patients with type C lesions. The patient's co-morbidities, the fully informed patient preference, and local operator's long term success rates must be considered when making treatment recommendations for type B and C lesions. TASC Classification of Aortoiliac Lesions Type A lesions - Unilateral or bilateral stenoses of CIA - Unilateral or bilateral single short (<3 cm) stenosis of EIA Type B lesions - Short (<3 cm) stenosis of infra-renal aorta - Unilateral CIA occlusion - Single or multiple stenoses totaling 3-10 cm involving the EIA not extending into the CFA - Unilateral EIA occlusion not involving the origins of internal iliac or CFA Type C lesions - Bilateral CIA occlusions - Bilateral EIA stenoses 3-10 cm long, not extending into the CFA - Unilateral EIA stenosis extending into the CFA - Unilateral EIA occlusion that involves the origins of internal iliac and/or CFA - Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CFA Type D lesions - Infra-renal aortoiliac occlusion - Diffuse disease involving the aorta and both iliac arteries requiring treatment - Diffuse multiple stenoses involving the unilateral CIA, EIA and CFA - Unilateral occlusions of both CIA and EIA - Bilateral occlusions of EIA - Iliac stenoses in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery CIA= common iliac artery; EIA=external iliac artery; CFA=common femoral artery; AAA= abdominal aortic aneurysm. Iliac occlusion is included as part of TASC B, C, or D lesions. Treatment of an occluded segment in the iliac segment is complicated by: perforation can lead to retroperitoneal bleeding, entering the proximal cap, traversing long calcified segment, entering the distal true lumen. Lesions can be accessed from the Ipsilateral femoral, contralateral femoral, and rarely brachial approach. Both intraluminal and subintimal space can be used for successful recanalization. Hydrophilic wires are commonly used to pass through the occluded segment. Placing a low profile (4 Fr.) angle catheter adjacent to the proximal cap, helps with penetrating the occluded segment. Forming a loop allows easy passage through the occluded segment, toward the reconstitution point. Lesions with denser calcification, long occluded segment may require more force when passing the hydrophilic wire. However, the physician must be careful not to perforate the occluded iliac artery. Using a crossing tool such as Frontrunner XP (Cordis Corp) allows easier penetration into the proximal cap and passage through the occluded segment. The blunt microdissection uses a pair of rounded hinged jaws that are actuated in a see-saw fashion with a handle on the proximal end of the device. The jaw opens to a diameter of 2.3 mm, and the crossing profile is 0.039 inch with the jaws closed. Once the lesion is crossed, the companion Micro-guide radio-opaque tip hydrophilic catheter is advanced until the lesion is crossed. At time, true lumen re-entry is possible by just using this device. Once the true lumen is entered, then back bleeding is seen through the hub of the catheter and passage of a .035 wire allows access to the distal patent artery. Other devices using laser or ultrasound technology has been used to penetrate and cross the occluded segment. The rate limiting step for a successful crossing of an iliac occlusion involves accessing the distal true disease free arterial lumen. At times, this requires using a re-entry device. There are two devices on the market: 1) Outback Re-entry device (Cordis Corp): this 6 Fr. device uses fluoroscopy to place the 22 G needle into the distal true lumen. A .014 wire is advanced distally into the true lumen and wire exchanged for a .035 wire. 2) Pioneer Catheter (Medtronic Corp): this device uses intravascular ultrasound (IVUS) to access the distal true lumen. The Pioneer catheter has a hypo-tube through the lumen with a curved retractable Nitinol needle distally. The needle projects away from the IVUS catheter at the 12 o'clock position on the IVUS image. The true lumen is identified by both the two dimensional and color flow imaging of the catheter. Once the needle is deployed, a .014 wire is passed into the true lumen. The .014 wire is exchanged for a .035 wire to facilitate angioplasty and stenting of the iliac artery. In summary, the ability to treat iliac occlusion was initially limited primarily by the failure to cross the occlusion, failure to enter the true lumen and finally by the failure of balloon angioplasty. With the development of stents to treat failed angioplasty, the primary cause for acute procedural failure in the treatment of iliac occlusion became the inability to cross the occluded segment and re-enter the distal true lumen. Development of a Frontrunner, a crossing device, and two re-entry devices (Outback and Pioneer) has made treatment of this occlusion less difficult with higher success rate and improved patency.

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OCCLUSIVE DISEASES OF THE LIMB

Aorto Iliac segment.

Why covered stents are not all the same in aortoiliac occlusive disease

Michel MPJ Reijnen

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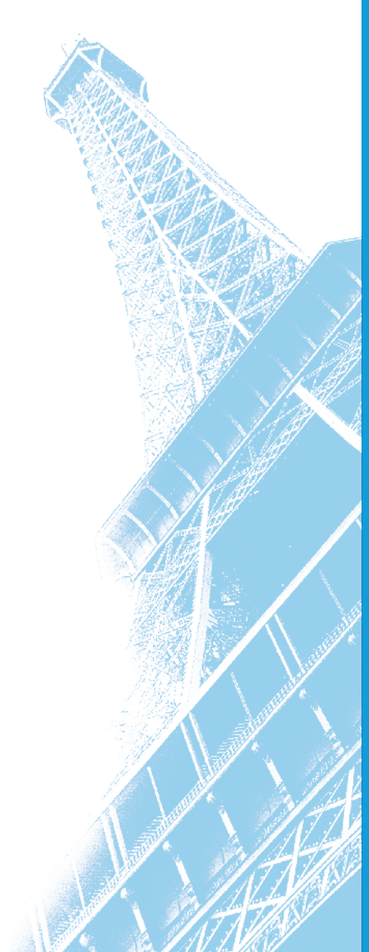
The use of covered stents increases the patency rates after endovascular treatment of extensive aortoiliac occlusive disease (AIOD), as was shown by various case series and randomized trials. The kissing stent technique is frequently used for bilateral AIOD, but results tend to be inferior to those of isolated lesions and therefore alternative strategies have been developed, such as the CERAB technique and the use of the AFX unibody endograft.

Most evidence on covered stents was obtained with the Advanta V12 balloon expandable stent. More recently, alternative balloon expandable stents were introduced that have different characteristics with regard to the stent material (Stainless steel *vs*. Cobalt Chromium) and graft design (encapsulated, external or internal PTFE cover). Comparative studies are still lacking. When reconstructing the aortic bifurcation, both CERAB and the AFX have been related to a good outcome in severe AIOD and both techniques have their own pro's and con's.

In conclusion, covered stents should be the choice in extensive AIOD. The availability of various balloon expandable and self-expanding covered stents will enable a tailor made decision making, but all devices should build their own evidence as characteristics may differ.



OCCLUSIVE DISEASES OF THE LIMB

Miscellaneous.

Sexual (dys) functions following aortic repair, do we need a randomized trial?

Serguei Malikov, Julien Koenig, Nicla Settembre, Zakariyae Bouziane
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Sexual function is an important quality of life criterion for patients. Sexual impotence is recognized as a potential consequence of aortoiliac obstructive disease since the description of Leriche syndrome. Later it will be shown that the damage of peri-aortic pelvic plexus during aorto-iliac surgery can lead to both sexual impotence and ejaculation disorders. Besides, several reports have also raised sexual dysfunction issues after treatment by EVAR. Since then, several studies have con rmed these findings, even though recognizing that sexual dysfunction remains multifactorial and poorly understood. The aim of our pilot study was to analyze the frequency of postoperative sexual dysfunction, comparing endovascular and open surgery in aortoiliac disease.

METHODS

To evaluate erectile function, we used SHIM survey (Sexual Health Inventory for Men). The assessment criteria were sexual function changes three months after the intervention: erectile function, ejaculation, frequency of sexual intercourses and overall sexual satisfaction. In this bicentric prospective study 36 patients were enrolled: 16 received endovascular aneurysm exclusion (EVAR) and 20 had an open aortoiliac surgery.

RESULTS

58.8% of all patients had impaired erectile function prior to surgery. The comparison of scores before and 3 months after intervention for open aorto iliac surgery showed a deterioration of erectile function in 42.8% of patients, loss of ejaculations in 45% and a decrease of the overall sexual satisfaction in 38.4%. Those disorders are related to sympathetic plexus damage during open surgery. For EVAR, we did not nd signi cant change in erectile function. The frequency of sexual intercourses had a tendency to decrease for all patients 3 months after both treatments.

CONCLUSIONS

This pilot study confrms the important impact of open aortoiliac surgery on male sexual function. It also shows that treatment with EVAR is a better technique for preserving sexual function. However many questions remain unresolved as the impact of the surgical approach: transperitoneal or retroperitoneal? The side effect of internal iliac arteries embolization on sexual function? Further studies are needed.

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OCCLUSIVE DISEASES OF THE LIMB

Miscellaneous.

Takayasu disease: is it still a room for intervention?

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The diagnosis of Takayasu arteritis (TA) remains challenging, particularly early in its course. An earlier diagnosis and a combination immunotherapy may result in a reduced requirement for vascular intervention in the next decade. But today still, delayed presentation and diagnosis still commonly results in extensive arterial injury, and the need for surgical or endovascular intervention in the management of TA.

Arterial stenoses/occlusion are the most common lesions treated and the principal indications are uncontrolled hypertension secondary to renal artery stenosis, aortic coarctation, symptomatic cerebrovascular disease, severe claudication and ischaemia related to coeliac or mesenteric artery stenosis. Surgery for aortic regurgitation and aneurysms repair is less common. There are no guidelines to direct the choice between open surgery and endovascular approaches. The decision may depend in part on local expertise and availability but also on the site and the nature of the arterial lesions. In fact, TA is a pan-mural arteritis and typically results in long scarred fibrotic stenosis that are substantially challenging for angioplasty. This is well illustrated by higher restenosis rates for angioplasty than seen with open surgery.

Restenosis is frequent for open surgery or postangioplasty, reaching more than 70% in some series at 5 to 10 years. The 5-year complication rate is markedly increased in patients with active inflammation at the time of revascularization. The sensitivity and specificity preoperative 18F-fluorodeoxyglucose PET/computerised tomography CT- scan in detecting persistent arterial wall inflammation remain to be proven, with yielding conflicting results. There are convincing data supporting the efficacy of perioperative immunosuppressive therapy, with a significantly improved outcomes. Even in these circumstances, inflammation cannot be excluded, with active arteritis detected in more than half of biopsies from patients how underwent surgery, with clinically inactive disease and normal acute phase reactants. Thus, there is a clear need to develop a validated set of outcome measures for use in clinical trials of TA.

The recent increasing use of biological agents targeting tumor necrosis factor (TNF-α) or Il-6 may result on a more effective anti-inflammatory effect. In fact, the majority of TA patients treated with biologic agents (mostly infliximab and mostly refractory cases) showed favorable results. Thus, outcomes of vascular intervention in TA may be improved by detailed preoperative measurement of disease activity, and by ensuring optimal immunomodulatory therapy before and after the procedure.

INFRA INGUINAL, SFA ENDO REPAIR

De Novo SFA lesions: material, results, uncertainties

What about stents?

Do the latest bare stents justify their use in the SFA/popliteal arteries?

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The superficial femoral artery and popliteal artery suffer major mechanical stress: radial compression, compression and longitudinal extension, bending, twisting during movements of the lower limb. [1,2] A recent study of 235 patients, measured by Doppler ultrasound the rate of intra-stent restenosis with calculation of systolic velocity popliteal found 24% of restenosis at 6 months, 49% at 1 year, 61.5% at 2 years. These figures are influenced by the length of the stents and the presence of diabetes. [3] All prospective and randomized studies have shown angioplasty alone for the primary patency rate at 40% at 1 year for lesions 10 cm long. The gain of primary stenting with BMS perforated laser was demonstrated by numerous randomized studies with patency rate at one year up doubled compared to ATL alone. [4] The association with restenosis of stents fracture [4] led to reconsider the perforated stents laser to offer more flexible and conformable stent could best meet the biomechanical strength of the knee and the SFA [4,5].New generations of bare stents "conformable" or "flexible" confirm reading recent studies published in 2016 (a gain of primary patency, primary assisted, and secondary one and two years in the stenting of the superficial femoral and popliteal including long lesions. [6,7,8] This significant improvement in patency (greater than 10%) to be confirmed by further prospective and randomized studies. A study comparing for identical lesions and selected using perforated stents laser and the latest generation of stents would be useful.

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DE NOVO SFA LESIONS: MATERIAL, RESULTS, UNCERTAINTIES

What about balloons in 2017?

Drug coated balloon are fine: do they work for TASC C and D lesions?

Peter Schneider
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INTRODUCTION

Drug coated balloons (DCBs) have recently become a reasonable and acceptable option for managing femoral-popliteal occlusive disease. Both randomized trial and registry data have demonstrated significant patency benefits. Most of the data that has accumulated so far pertains to TASC A and B lesions. In this population, DCB produced significantly higher patency and lower TLR rates than balloon angioplasty at 1-3 years. [1,2] The question at hand is whether this benefit extends to patients with lesions longer than 15 cm.

DATA ON TASC C/D LESIONS

Two retrospective studies have been published that include large series of patients from Bad Krozingen and Leipzig. DCB treatment of lesions with a mean length of 24cm demonstrated a duplex derived patency of 79% at 12 months. [3] In another study, a retrospective analysis was performed of both DCB and drug eluting stent placement for management of long lesions. [4] Mean lesion length for DCB patients was 19cm and restenosis was 24% at one year. One prospective study from Italy demonstrated that DCB patency at one year was 83%, with a mean lesion length of 25cm. [5] Unpublished data has also been presented for the IN.PACT Global Registry, which included a long lesion cohort of 157 patients with lesions >15cm in length with a mean lesion length of 26cm and a one-year core lab adjudicated patency of 91%. [6] There have been no randomized trials of patients with long lesions treated with DCBs. Studies of long lesions to date have demonstrated that post-DBC bailout stent placement is more likely. In the IN.PACT Global Registry, 53% of patients with lesions >25cm required stents. In considering treatment of TASC C/D lesions, all data so far pertains to lesion length, whereas TASC C/D lesions that include common femoral disease, distal popliteal occlusions and other morphologies have not been evaluated.

CONCLUSION

Early data for the results of DCBs in long lesions are very promising.

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DE NOVO SFA LESIONS: MATERIAL, RESULTS, UNCERTAINTIES
What about balloons in 2017?
Drug coated balloons: are the results durable?

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Drugcoated balloons are still under investigation in trials for their use in the femoropopliteal area. The use of drugcoated balloons (DEB), can potentially reduce the number and length of stenting in the SFA and or popliteal artery. Although there are clear indications of the benefits in case of restenosis or in-stent restenosis, scientific evidence to support our title is still lacking today for de novo stenoses. An overview of available data shows an sustained improvement of primary patency at twelve months. For TASC A and B lesions the Levant 2 trial (average lesion length of 6.3 cm) showed a primary patency of 73.5% and In-.Pact SFA (average lesion length 8.9 cm) 89.8%. Randomized data comparing drug coated balloons to PTA (Debellum; Katsanos; Pacifier; Levant I and Ranger) showed for all trials an improved TLR rate at 6 months. Most recent published data from the Illuminate EU RCT showed an improved primary patency at twelve months of 89.0% (as compared to PTA: 65.0%) and a TLR rate of 5.2 % (as compared to PTA: 14.7%).

CONCLUSION
Treatment of de novo SFA disease with DEB seems safe and feasible, shows promising primary patency rates and freedom from TLR, especially for TASC A and B lesions.

DE NOVO SFA LESIONS: MATERIAL, RESULTS, UNCERTAINTIES
Debulking and CTO
Experience with a new debulking technology

Ulrich Sunderdiek
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Today, femoral-popliteal lesions are commonly treated endovascular with good clinical results. However, the presence of severe vascular calcification presents a significant procedural challenge to current endovascular strategies. Limitations and complications of traditional and drug-eluting angioplasty are dissection, recoil, and disruption of the internal lamina, resulting in neo-intima and smooth muscle cell proliferation. Although the use of the last generation self-expanding nitinol stents may be an effective treatment for femoral-popliteal lesions, with high procedural success rates, restenosis rates can be as high as 10-40% at six to 24 months.
Atherectomy is a procedure performed to remove or "debulk" the atherosclerotic plaque from diseased arteries. In severely calcified vessels, atherectomy can also be used to "prepare" the vessel prior to stenting in order to prevent incomplete or eccentric stent expansion. So far, there are a few different atherectomy devices available which allow different methods of atherectomy.

METHODS
We are currently performing almost 150 procedures with atherectomy per year, in most of them we are using a rotational atherectomy system, the JetStream System from Boston Scientific. It has differential and circumferential cutting blades to debulk both hard (calcified, fibrotic) and soft (thombus, plaque) tissues with almost minimal damage to the vessel wall. The tissue debris are aspirated through the side port. In 2014/15 we performed 228 procedures with the JetStream System in femoropopliteal lesions. After atherectomy all lesions were dilatated with a DCB.

RESULTS
Lesion length was 2-28 cm, with a total of 68% occlusions, 74% in the popliteal artery. Technical success was 94%, the stent rate was 12%. According to analysis from data of the electronical hospital administration system freedom of TLR was 84%, with the limitation of inconsistent follow-up.

CONCLUSION
These experience, as well as other published data, demonstrate that rotational atherectomy in combination with DCB balloning offers a safe strategy in debulking complex lesions even in challenging anatomical segments and it may overcome the limitation of balloon angioplasty and stent placement.

DE NOVO SFA LESIONS: MATERIAL, RESULTS, UNCERTAINTIES

What about balloons in 2017? Restenosis

Infra inguinal vein graft stenosis: DEB or stents?

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PMU Salzburg, Salzburg, Austria

INTRODUCTION

The aim of our study is to compare the clinical and hemodynamic outcomes of plain *vs* paclitaxel coated percutaneous transluminal angioplasty (PTA) in the treatment of infrainguinal vein bypass stenosis.

METHODS

A single center retrospective analysis was conducted of consectutive patients treated by infrainguinal bypass PTA: Primary endpoints were primary and assisted primary patency. Secondary endpints were clinical and hemodynamic improvement, limb salvage and survival. Society of Vascular Surgery (SVS) reporting standards were applied.

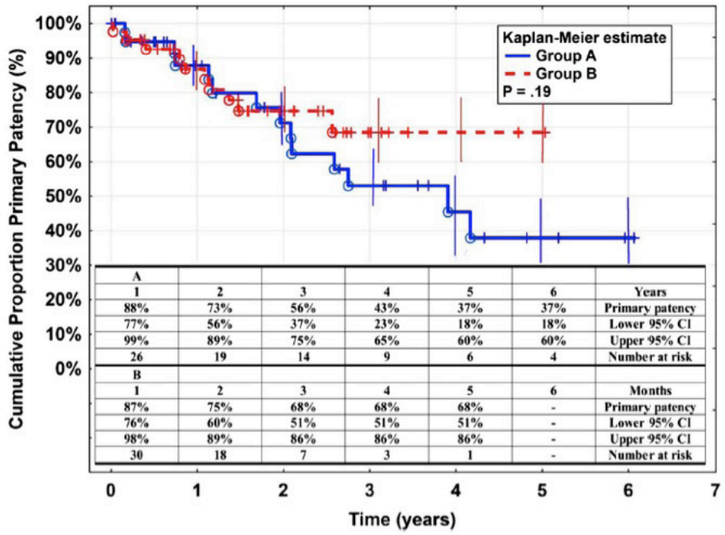
RESULTS

From April 2008 to November 2014, 83 infrainguinal vein bypasses were treated for graft stenosis by plain (Group A, n=41) or by paclitaxel coated PTA (group B, n = 42). The groups did not differ significantly with regard to mean age (71.9 years in both groups, p:0.99, hypertension (p:1.0), hyperlipidemia (p:0.5), diabetes (p:0.6), coronary artery disease (p:1.0), smoking (p:1.0), preoperative ankle-brachial indes (p:0.8) or bypass characteristics (below knee, p:0.82). Technical success rate was 100% for both groups Mean follow up was 2.9 years in group A patients and 2.2 years in group B patients. No patient was lost to floow up. Primary patency rates were 88% *vs* 87% and 73% *vs* 75% (p:0.19), and assisted primary patency rates were 88% *vs* 90% and 77% *vs* 84% (p:0.76) for group A and B patinets at one and two years respectively. Repeat target lesion revascularization rates were 22% and 14% (p: 0.17). At the last follow up there were 8 *vs* 7 bypass occlusions (p:0.74) for group A and B patients, respectively. In univariate analysis, proximal in-graft stenosis (Cox F, p:0.047), bypass failure < 6 months after surgery (Cox F, p:0.013), more than one bypass stenosis per graft (Cox F, p:0.047) and redo bypass procedure (Cox F, p:0.0001) were significantly related to assisted primary patency. Immediate hemodynamic and sustained clinical improvement rates were 88% *vs* 86% and 70% *vs* 73% for group A and B patinets respectively. There were three *vs* one major amputations (p:0.36) and eight *vs* seven deaths (p:0.78) in group A and B patients respectively.

CONCLUSIONS

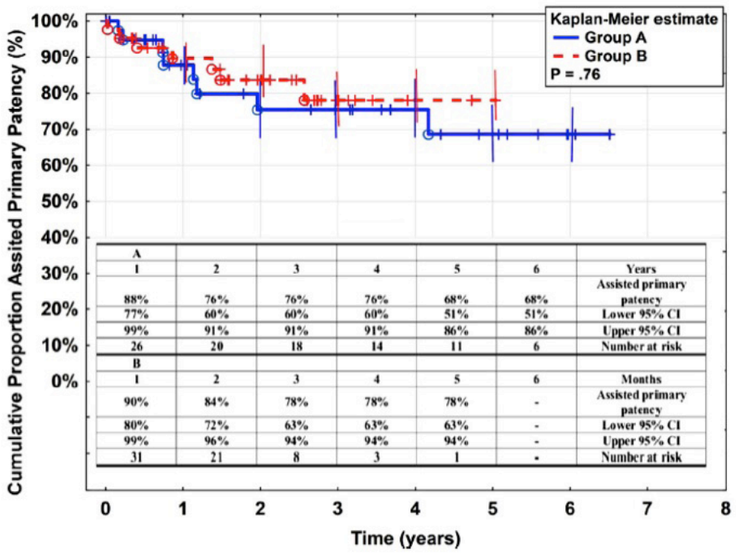
Paclitaxel and plain balloon angioplasty of significant infrainguinal vein bypass stenoses performed equally well in clinical and hemodynamic improvement and in primary and assisted primary patency rates.

FIGURES



A						
1	2	3	4	5	6	Years
88%	73%	56%	43%	37%	37%	Primary patency
77%	56%	37%	23%	18%	18%	Lower 95% CI
99%	89%	75%	65%	60%	60%	Upper 95% CI
26	19	14	9	6	4	Number at risk
B						
1	2	3	4	5	6	Months
87%	75%	68%	68%	68%	-	Primary patency
76%	60%	51%	51%	51%	-	Lower 95% CI
98%	89%	86%	86%	86%	-	Upper 95% CI
30	18	7	3	1	-	Number at risk

Primary patency of group A *vs* group B patients Kaplan-Meier estimation of the cumulative primary patency in patients undergoing plain balloon (Group A) or paclitaxel coated balloon (Group B) angioplasty of infrainguinal vein bypass stenosis



A						
1	2	3	4	5	6	Years
88%	76%	76%	76%	68%	68%	Assisted primary patency
77%	60%	60%	60%	51%	51%	Lower 95% CI
99%	91%	91%	91%	86%	86%	Upper 95% CI
26	20	18	14	11	6	Number at risk
B						
1	2	3	4	5	6	Months
90%	84%	78%	78%	78%	-	Assisted primary patency
80%	72%	63%	63%	63%	-	Lower 95% CI
99%	96%	94%	94%	94%	-	Upper 95% CI
31	21	8	3	1	-	Number at risk

Primary assisted latency of group A *vs* group B patients aplan-Meier estimation of the cumulative primary assisted patency in patients undergoing plain balloon (Group A) or paclitaxel coated balloon (Group B) angioplasty of infrainguinal vein bypass stenosis

DE NOVO SFA LESIONS: MATERIAL, RESULTS, UNCERTAINTIES

Infra inguinal surgical repair

Does heparin-bonded ePTFE graft improve BTK bypass patency?

Carlo Pratesi
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AIM OF THE STUDY

To retrospectively evaluate long term results of heparin-bonded expanded polytetrafluorethilene (ePTFE) bypass graft (Hb-ePTFE) in patients with critical limb ischemia (CLI) in a multicentre registry and to assess the existence of subgroups of patients with a significant clinical benefit deriving from its use.

METHODS

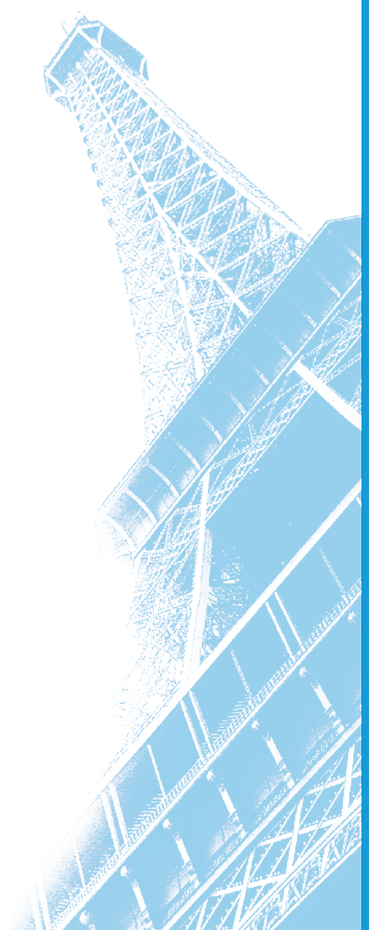
Over a 13-year period, ending in March 2015, a Hb-ePTFE graft was implanted in 683 patients undergoing below-knee revascularization for CLI in seven Italian vascular hospitals. Data concerning these interventions were retrospectively collected in a multicenter registry with a dedicated database. Follow-up results were analyzed in terms of survival, primary and secondary patency and amputation free survival (AFS): univariate and multivariable analyses with Kaplan Meier estimates were used to identify potential significant predictors of AFS at 5 years, and then a predictive risk score was constructed by dividing the β-coefficient of each significant predictor at multivariable analysis by 0.25 and by rounding off to the nearest integer value. A qualitative assessment of the Kaplan-Meier survival estimates for each integer score was performed and subgroups of risk were stratified on the basis of the primary endpoint.

RESULTS

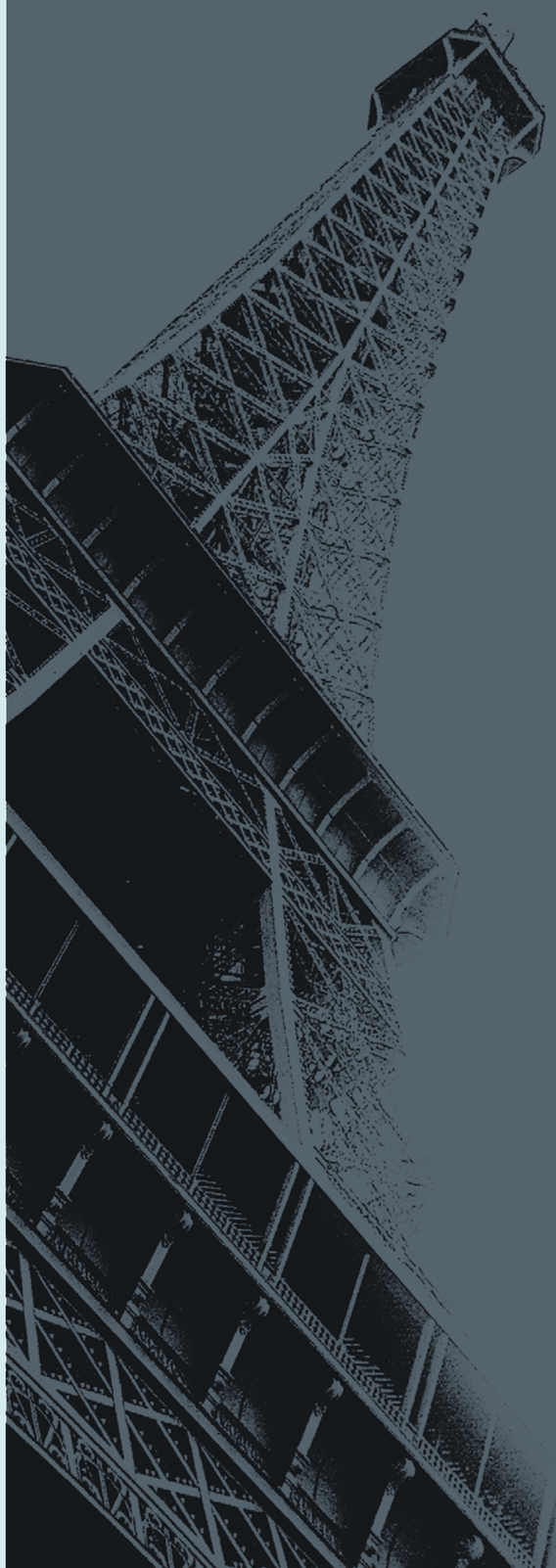
Median duration of follow-up was 25 months (range 1-156); only 6 patients (1%) had no available follow-up at all. Estimated 5-year survival rate was 62.7% (SE 0.025); the corresponding figures in terms of primary and secondary patency were 42.7% (SE 0.025) and 54.1% (SE 0.026). Graft infection leading to graft explantation occurred in 13 cases (1.9%). Limb salvage rate at 5 years was 75.5% (SE 0.021), while estimated 5-year AFS rate was 48.3% (SE 0.024). At multivariate analysis, older age, coronary artery disease, end-stage renal disease, tissue loss and poor run-off score were predictors of AFS. The integer score ranged from 0 to 11; Kaplan-Meier analysis for AFS in each score group identified three subgroups with significant differences at 5 years: low-risk subgroup (scores from 0 to 2, 67.7%), medium-risk subgroup (scores 3 and 4, 49.2%, $p<0.001$ in comparison with low-risk subgroup) and high risk subgroup (scores from 5 to 11, 25.2%, $p<0.001$ in comparison with either low-risk subgroup or medium-risk subgroup).

CONCLUSIONS

The use of Hb-ePTFE bypass grafts in patients with CLI was associated in this large multicentre experience with excellent results. A category of low-risk patients with CLI treated with the indexed graft does exist, thus suggesting a primary role for Hb-ePTFE in such patients, who had 5-year results well comparable with those obtained with autologous saphenous vein in Literature. A prospective validation of such a score is necessary.



CONTROVERSIES & UPDATES IN VARICOSE DISEASE



SATURDAY JANUARY 21

- VENOUS SESSION -

DEEP VEIN

History of deep vein reconstruction in CVD

Bo Eklöf
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DEEP VENOUS REFLUX

Modern history of deep venous reconstruction started with Bob Kistner's pioneering work in Hawaii 1968 with internal valvuloplasty in a patient with primary axial deep venous reflux. However, he was standing on the shoulders of the Swedish pioneer Gunnar Bauer who 20 years earlier in 1948 using descending venography had described idiopathic (primary) deep venous reflux which he treated by popliteal vein resection in more than 500 patients suffering from pain, swelling and ulceration. Bauer's destructive resection of the popliteal vein was now replaced by Kistner's reconstructive repair of a floppy valve. Modifications of Kistner's repair was described by Raju, Sottiurai and Tripathy. Kistner also described external valve repair. In secondary PT deep venous reflux he created transposition of the incompetent deep vein into a valve bearing segment, and Taheri axillary vein transplant into the popliteal vein in 1982. The European experience with deep venous valve repair started with Ingvar Eriksson in Uppsala, Sweden in 1978 and Michel Perrin in Lyon, France in 1981. The creation of a neovalve in secondary PT venous reflux started with Pagnol in France 1999 and Maleti in Italy 2002.

ACUTE THROMBOTIC DEEP VENOUS OBSTRUCTION

The first venous thrombectomy for iliofemoral DVT was performed by Läwen in Germany 1937. This created a wave of enthusiasm around the world. In the US Mahorner together with many surgeons presented excellent early results, but poor late results led to abandonment. In Europe good results were presented from France (Leriche, Fontaine, Kiely), UK (Mavor and Galloway), Germany (Vollmar, Loeprecht), Austria (Denck). In Sweden we adopted the pioneering work of Kunlin and Loeprecht combining thrombectomy with a temporary AVF showing significant improvement of results in a RCT. Now the endovenous procedures are taking over.

CHRONIC DEEP VENOUS OBSTRUCTION

This can be due to PT disease or nonthrombotic iliac vein obstruction (May-Thurner or Cockett's syndrome) where the main symptom is venous claudication and/or venous ulceration. A number of surgical procedures have been recommended. The first femoro-femoral cross-over bypass was described by Palma in 1958. The method of choice today is percutaneous endovenous angioplasty and stenting as described by Neglén and Raju.

DEEP VEIN

Cause of failure and complications of pelvic congestion embolization and how to avoid them

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Efficacy of embolization for pelvic congestion syndrome has been demonstrated by several large series with an excellent safety and a remarkably low rate of complications. As rare as they are, these complications must be known and considered to be impaired, and the most frequent at least have to be exposed to the patient as part of a strong relationship of trust. Per and post procedure pain is the most classic with glue and foam, easily supported by medical treatment, and should be part of the initial information of the patient. Migrations, classically described in the literature with coils must be discussed. They decrease with the operator's experience and a particular caution in short and large iliac tributaries. Gentle manipulation and soft catheters should avoid venous damage which is mainly cause of technical failure and recurrence. Recurrence can be treated by repeated embolization but differential diagnoses must then be considered with a particular attention. Numerous and various unexpected complications may occur that are more often difficult to predict and described in isolated and inconstant formal reports. They are most often retrospectively explained by the complex functional anatomy, the multiple unseen connections of the involved venous systems and their structures in contact, especially urinary and nervous. A strong knowledge of venous physiopathology and hemodynamics, with expertise of the different embolic agents used should avoid a large part of complications. But although rare, complications should be used as return of experience to be reminded as well as their circumstances of occurrence.

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DEEP VEIN

Aggressive endovascular management of ilio-femoral DVT is the "Key" in preventing post thrombotic syndrome

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Acute deep vein thrombosis (DVT) affects more than 250,000 patients per year. Although up to 50% of the patients are asymptomatic, all are at risk for pulmonary embolism (PE). Symptomatic PE is the most important acute complication of DVT, with more than 600,000 cases per year in the USA responsible for 200,000 deaths. Despite the percentage of asymptomatic patients, the sequelae of DVT can be devastating and lifestyle limiting. DVT and post-thrombotic syndrome can produce pain, edema, leg discomfort, varicosities, skin hyperpigmentation, venous stasis ulcer and venous gangrene resulting in amputation. Historically, treatment options have included preventing propagation of thrombus with anticoagulation, inferior vena cava filters (IVC) filters, surgical thrombectomy, systemic and catheter-directed thrombolysis and more recently mechanical thrombectomy and thrombolysis techniques. Recently, more aggressive minimally invasive techniques involving lysis and device combination treatment regimens to address large volume DVT (caval, iliofemoral, and femoral-popliteal) have been developed. Such "combination therapy" have included use of AngioJect Rheolytic thrombectomy catheter, Trellis Isolated thromboslysis catheter and EKOS. AngioJet RT system consisits of three components: a single use catheter, single use pump set, and a pump drive unit. 6 Fr. Xpeedior catheter has a working length of 120 cm which is introduced via a 6 Fr. Sheath percutaneously over a .035 wire. The high velocity jets create a localized low pressure zone (Bernoulli effect) for thrombus aspiration and maceration. The jets also provide the driving force for evacuation of thrombus particulate debris through the catheter. Activase (TPA) is a tissue plasminogen activator. It has the property of fibrin enhanced conversion of plasminogen to plasmin. It binds to fibrin in a thrombus and converts the entrapped plasminogen to plasmin. This initiates local fibrinolysis with limited systemic proteolysis. A prospective multicenter registry, the National Venous Thrombolysis Registry, was established in order to collect and analyze data for a large number of patients with lower extremity DVT treated with Catheter directed thrombolysis (CDT). Venous registry demonstrated that CDT was less effective in patient with chronic DVT. Acute cases of DVT (<10 days) achieved complete lysisi almost twice as often as patients with chronic DVT (>10days). It is also proposed that CDT is a better option for long term management of DVT, since systemic anticoagulation, the current standard of care, neither promotes lysis nor the restoration of valve function necessary for the prevention of PTS. The combination of using both pharmacological and mechanical thrombolysis/thrombectomy is even more powerful. It decreases the dose and infusion time of thrombolytic drugs, with fewer bleeding complications and comparable procedure success to CDT alone. This combination, improves outcomes since it initially reduces the thrombus burden and it exposes a greater area of thrombus surface to the lytic agent.

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Next Article: June 2015Volume 26, Issue 6, Pages 777–785

VULVAR VARICOSE VEINS AND MISCELLANEOUS

Vulvar varicose veins after pregnancy: Do we have to ligate the leak points?

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2. Clinica Filglie di San Camillo, Cremona, Italy

OBJECTIVE

The objective of this study was to assess the efficacy of the pelvic leaks surgical disconnection in woman.

CONTEXT

Pelvic leak points (PLP) may be responsible for vulvar, perineal and lower limbs varicose veins especially in women during and/or after pregnancy. The accurate anatomical and hemodynamic assessment of these points, perineal (PP), inguinal (IP), clitoridian point (C P) and their surgical treatment under local anesthetics as defined by Claude Franceschi (REF: 3 articles + Livre) is a new therapeutic option.

METHODS

In this open-label trial 273 pelvic leak points free of pelvic congestion syndrome were assessed and marked with ultrasound and selected when refluxing at Valsalva + Paranà + squeezing maneuvers, then disconnected with mini-invasive surgery under local anesthesia in a single center. Surgery consisted of selective division and non absorbable suture of the refluxing veins and fascias at the PP,IP and CP pelvic escape point.

RESULTS

Ablation procedures: 273 PLP: PP (n= 170), IP (n = 100) and CP (n=3). Follow up: Period =12 to 90 months (Mean = 30.12 months). Controlled PLP (n= 273) No Pelvic leak reflux redo (n = 270) Pelvic leak reflux redo (n= 3) where PP = 2 IP =1

CONCLUSIONS

This study suggests that pelvic varicose embolization prior PLP reflux ablation is not necessary and indicated only in case of uncontrolled PLP reflux or when combined with pelvic congestion syndrome.
The accurate ultrasound assessment of each specific pelvic leak as well as a peculiar surgical technique (vein division, non absorbable suture of veins and fascias) seems to be the key for satisfactory outcomes.

VULVAR VARICOSE VEINS AND MISCELLANEOUS

Vulvar varicose veins after pregnancy: Do we have to embolize the leak points?

Milka Greiner
MD, Paris, France

Valvular varices involve 4% of the women population. Varices are located on the labia majora and/or minora and are usually noted after second pregnancy. Most often asymptomatic, they can be debilitating especially when they are cause of pruritus and dyspareunia. They are isolated or associated with perineal varices, lower limbs varices and may occur as part of pelvic congestion syndrome (PCS).
In our practice the decision-making process is based on patient medical history and clinical symptoms. Two identities are to be separated: 1.small vulvar varices without PCS which need first line sclerothrapy, 2.large vulvar varices (with or without PCS) which require complementary tests, at pelvic and abdominal level, such as venous echo-doppler before adequate treatment.

VULVAR VARICOSE VEINS AND MISCELLANEOUS

Small Saphenous Vein (SSV) treatment: tips and tricks

Jean-Luc Gérard
Paris, France

Incompetence of the great saphenous vein (GSV) is the most frequent cause of varicose vein disease. SSV incompetence is identified in 20 % of patients presenting varicose veins. Because the ending of the SSV is variable as well as the proximity to the arteries and nerves, its treatment makes it more challenging than for the GSV.

During sclerotherapy treatment (liquid or foam), vascular physicians are afraid of mistakenly injecting the artery companion to the SSV. By duplex it is easy to locate the exact position of the arteries. Even if ultrasound guidance foam sclerotherapy (USGS) is safer, it may remain, fortunately a rare occurrence, a source of major events and litigation claims. Carefully locating the arteries and therefore delimitating a safety zone by pastel pencil would prevent this complication from arising.
Thermal ablation: endovenous laser ablation (EVLA) or radiofrequency ablation (RFA) are described as minimally invasive techniques, but mainly for the GSV, and less frequently for the SSV. Guidelines recommend a mapping prior to any type of saphenous treatment; this is of course particularly true for the SSV. In addition, due to the improvement of the Duplex scan technology, it is also possible now to identify nerves (tibial, fibular and sural nerves) and do the mapping of the nerves. Therefore, during the tumescent anesthesia and under ultrasound guidance, the position of the nerves, which are previously identified, determinates a safe puncturing area with the needle, at a certain distance from them. Tumescent anesthesia would also permit isolating the nerves by pushing them away from the SSV.

VULVAR VARICOSE VEINS AND MISCELLANEOUS

Endo Laser Ablation Foam (ELAF)

Carlos Bone
Palma de Mallorca, Spain

With the aim of improving the treatment of truncal (main) varicose veins in a completely ambulatory manner without using local anesthesia, we have initiated a synergistic physicochemical procedure, involving the effect of an soft sclerosing foam, the energy transmitted and released by the laser to the venous endothelium, thereby obtaining with this association the endothelium ablation with a frankly outstanding result.
The use of this synergistic technique has allowed us to reduce both the concentration of the sclerosing agent and the fluence delivered by the laser, avoiding the use of anesthesia, so that we have transformed it on a purely outpatient procedure that can be done in the medical office, without strict operating room.

VULVAR VARICOSE VEINS AND MISCELLANEOUS

Treatment of telangiectasies by microsurgery

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Telangiectasias of the legs may be isolated. However, most of them are consecutive to an underlying venous reflux, which should be eliminated to obtain satisfying and long lasting results. This reflux may be easily detected at the clinical examination or with echography, if it is caused by a saphenous, a tributary, a large non saphenous vein insufficiency or the incompetence of a major perforator. In many patients, especially in therapy resistent telangiectasias, reflux may be difficult to establish. Side illumination is a valuable help to detect feeding reticular veins, which should be treated by sclerotherapy, or phlebectomy. Phlebectomy is also indicated to remove tiny underlying perforators. Subcutaneous curettage of large blue telangiectasias with the harpoon of a sharp hook is quite effective in destroying large clusters of blue veins, and may be associated to sclerotherapy in tumescent anaesthesia (START Technique) to destroy therapy refractory telangiectasias. Complications are rare and excellent cosmetic and functional results may be achieved in one or 2 sessions.

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VEIN AND THROMBOSIS

Venous symptoms: the SYM vein consensus

Michel Perrin[1], Bo G. Eklof[2] for the SYM Vein group
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2. Vascular Surgery, Helsingborg, Sweden

INTRODUCTION

Venous symptoms remain a challenge to deal with for multiple reasons. First, few books or articles in the literature dedicated to chronic venous disorders give a precise description and definition of the so-called "venous symptoms". In addition, there is frequent confusion between signs and symptoms in the literature. The fact that venous symptoms are non-pathognomonic adds to the difficulty, because linking these symptoms with their etiology and their cause is still debated. The severity of the signs and the results of investigations do not always correlate with the intensity of the symptoms. Lastly, the pathophysiology of venous symptoms has not been clearly established, in particular in C0s patients?
Precise physiopathologic knowledge should lead to more targeted and specific treatment

AIM OF THE CONSENSUS

To create a document on venous symptoms in order to:
- Describe venous symptoms:
- Specify which components enable symptoms to be attributed to a venous cause
- Determine their pathophysiology
- Establish a score dedicated to the symptoms
- Determine which clinical examination and investigations are useful for identifying the venous cause of symptoms

METHODS

To produce this consensus statement, an international group of 22 members from 14 countries was formed, including vascular specialists (medical and surgical), dermatologists, a neurologist and a healthcare economist. The first meeting was held in Paris in June 2014 during the XVth European Venous Forum meeting. The 23 participants were divided into 5 groups, one for each of the objectives described previously in the consensus objective. This second plenary meeting was held in St. Petersburg during the XVth EVF meeting in July 2015.Each manuscript was read during the plenary meeting and discussed during two 4-hour sessions. Then the corrected documents have been in circulation within each group until reaching a consensus

RESULTS

The Sym Vein consensus article has been published: Perrin M, Eklöf B, van Rij A, Labropoulos N, Michael Vasquez M, Nicolaides A *et al*. Venous symptoms: the SYM Vein Consensus statement. International Angiology 2016;35(4):374-98. Symptoms listed in the article: Primary symptoms: Pain or aching, Venous claudication, Throbbing, Tightness, Heaviness, Fatigue, Feeling of swelling, Cramps, Itching, Restless legs,Tingling, Heat or burning sensation
Secondary symptoms: disquiet, insomnia, ill-being, etc.

CONCLUSION

SYM VEIN had make possible to:
- establish a consensus statement specifically dedicated to symptoms
- determine whether the presence of symptoms in the absence of signs is compatible with the diagnosis of primary chronic venous disorders, and/or is predictive of the disease evolution
- stimulate the development of new investigations allowing the identification of anomalies in C0s patients
- measure the benefit of treatments in terms of symptoms relief after treatment

VEIN AND THROMBOSIS

Are there differences in guidelines for management of CVD between Europe and the US?

Bo Eklöf
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In 2011 SVS/AVF published The care of patients with varicose veins and associated chronic venous diseases: clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum in JVS.[1] 14 guidelines based on 375 references were recommended or suggested using the GRADE system. In 2012 Lugli, Maleti and Perrin published a thorough review of these recommendations in Phlebolymphology 'bearing in mind that as Europeans we may have some divergence in opinion with our American colleagues'.[2] In 2013 the British guidelines were presented – NICE guidelines on varicose veins: diagnosis and management, a comprehensive document including 250 pages.[3] In 2014 EVF/UIP published Management of CVD in the lower limbs – guidelines according to scientific evidence based on 1,097 references.[4] In 2015 ESVS published Management of chronic venous disease – clinical practice guidelines of the ESVS with 66 recommendations based on 588 references.[5] There was a general agreement between the guidelines on both sides of the Atlantic. A comparison will be presented.

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VEIN AND THROMBOSIS

RCT on GCS/LMWH *vs* LMWH in VTE prophylaxis

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BACKGROUND

The evidence base upon which current global venous thromboembolism (VTE) prevention recommendations have been made is not optimal. The cost of purchasing and applying Graduated Compression Stockings (GCS) in surgical patients is considerable and has been estimated at £63.1 million each year in England alone.

OBJECTIVE

To determine whether low dose low molecular weight heparin (LMWH) alone is non-inferior to a combination of GCS and low dose LMWH for the prevention of VTE.

METHODS

A randomised controlled Graduated compression as an Adjunct to Pharmacoprophylaxis in Surgery (GAPS) Trial [ISRCTN 13911492] will randomise adult elective surgical patients identified as being at moderate and high risk for VTE to receive either the current 'standard' combined thromboprophylactic LMWH with GCS mechanical thromboprophylaxis, or thromboprophylactic LMWH pharmacoprophylaxis alone. To show non-inferiority (3.5% non-inferiority margin) for the primary endpoint of all VTE within 90 days, 2236 patients are required. Recruitment will be from seven UK centres. Secondary outcomes include quality of life, compliance with stockings and LMWH, overall mortality, and GCS or LMWH-related complications.

Recruitment commenced in April 2016 with the seven UK centres coming 'on-line' in a staggered fashion. Recruitment will be over a total of 18 months with more than 300 participants randomised to date. The GAPS trial is funded by the UK National Institute for Health Research Health Technology Assessment [14/140/61].

VEIN AND THROMBOSIS

Risks of Dvt and flying

Sarah Onida, Alun H Davies
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Globalisation and internationalisation, combined with affordable air travel, has resulted in a steady, year on year increase in the number of flights worldwide. Air travel has characteristically been considered a risk factor for the development of venous thromboembolic disease (VTE), including deep venous thrombosis (DVT), particularly in the context of what is known as the "economy class syndrome". The increased VTE risk has been attributed to factors such as immobility, cramped positioning, dehydration and hypobaric hypoxia, leading clinicians to advise against air travel in the postoperative period and airline providers to provide advice to minimise this risk. Interestingly, many of these suggestions are not evidence based; in this talk, the risks of VTE and flying will be discussed; specifically, the risks relating to the immediate postoperative period following superficial venous intervention will be reviewed.

THERMAL OR GLUE TECHNIQUES

15 year follow-up of radiofrequency ablation of the great saphenous vein and what are the causes of recurrence in the long term – a single centre experience

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2. University of Surrey, Guildford, United Kingdom

BACKGROUND

Radiofrequency ablation for the treatment of varicose veins was introduced in the late 1990s in the form of the bipolar VNUS Closure® device, and rapidly gained favour with vascular surgeons worldwide. However, no long-term data regarding the success of this treatment exists in the literature. We report the results of the original VNUS Closure® device for the abolition of venous reflux at 15 years.

METHODS

We invited 189 patients originally treated using VNUS Closure® from March 1999 to December 2001 to return to our unit for duplex ultrasonography (DUS) performed by a sonographer blinded to the initial treatment. Initial and 15 year scans were compared. Treatment outcome of the target vein was graded as follows: 1- complete success (complete atrophy with no reopening); 2- partial success (at least one patent section not giving rise to recurrent varicose veins); 3- partial failure (one or more patent sections giving rise to recurrent varicose veins); 4- complete failure (complete re-opening of treated vein).

RESULTS

Fifty-eight patients (91 legs, 101 truncal veins) returned for follow-up DUS, giving a 31.5% response rate (low due to the fact that many patients treated 15 years ago had either moved away or were deceased). DUS showed that a mean of 15.4 years post-procedure, 89% of patients achieved success with no clinical recurrence in the originally treated veins. At follow-up, 52/91 legs (57.1%) demonstrated an improved CEAP score. De novo reflux was identified in 47/91 legs (51.6%) showing disease progression in veins that were originally competent.

CONCLUSIONS

Ablation of truncal veins by Radiofrequency is capable of achieving excellent long-term technical success, as demonstrated by DUS.

THERMAL OR GLUE TECHNIQUES

Is there a role for open venous surgery assuming thermal and non-thermal procedures are covered?

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The traditional surgical technique is associated with about 20-30% of recurrence rate. The causes of recurrences are technical or tactical in approximately 29% of the cases, while neovascularization is responsible for another 29%. Moreover, more than 50% of recurrent varicose veins originates from the saphenous-femoral junction. To reduce the incidence of recurrences the following points seems to be important: 1. An accurate initial diagnosis in order to reduce tactical recurrences; 2. Varicose veins surgery should be performed by trained surgeon; 3. Stripping of the Great Saphenous Vein (GSV) should be performed with invagination; 4. Closure of the fossa ovalis; 5. Suture of the Sapheno-femoral Junction exposed endothelium with a non absorbable suture. The complications of Varicose veins surgery include: Deep Vein Thrombosis (DVT), damage of the saphenous or sural nerve, infections, haematomas, haemorrage and very rarely vascular lesions. The incidence of DVT in this kind of surgery is reported at a rate of about 1% and there is evidence from some studies that prophylaxis does not necessarily protect from DVT, therefore the systematic use of low molecular heparin is not indicated. Immediate deambulation after surgery and the use of elastic stockings are the first mean of prevention to be used. To prevent neurological damage we can: 1. Perform a tailored stripping, avoiding long stripping when not indicated; 2. If necessary use an invaginating technique; 3. Use a very delicate dissection at the malleolus to avoid direct damage of the nerve. Using a very delicate dissection at the sapheno-femoral or sapheno-popliteal junction the incidence of infections and lymphatic damage is very low. Varicose vein surgery should be performed on an ambulatory basis with local or tumescent local anaesthesia, entailing a much more delicate surgical act and a lower incidence of complications.

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THERMAL OR GLUE TECHNIQUES

Arteriovenous fistula after thermal ablation: etiology and how to avoid it

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Endovenous thermal ablation, laser or Radiofreqauency, is the mainstay of therapy for symptomatic varicose veins with saphenous venous insufficiency. Both procedures are efficacious with a high safety profile. Two new complications recognized unique to endothermal ablation are endothermal heat induced thrombosis and arteriovenous fistula (AVF). The presentation will limit the discussion to AVF. In a systematic review, there are more AVFs related to endolaser ablation than RFA. There are potentially serious sequelae of post-ablation AVFs, including severe limb edema, high-output cardiac failure, steal syndrome with claudication, and distal ischemia. Most patients are asymptomatic, do not require further diagnostic imaging. The natural history of postoperative AVFs remains to be clarified; however, it seems that spontaneous closure is common. On the basis of our experience and review of the literature, in the absence of severe symptoms, we would recommend expectant management with clinical and DUS surveillance. Ways to avoid AVFs is to know anatomy, how to administer proper tumescent anesthesia, and non-ablative procedures.

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THERMAL OR GLUE TECHNIQUES

Complications and weird findings with local anesthaesia in varicose vein surgery

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The surge of endovenous techniques in the last decade has made the use of general anaesthesia for venous interventions obsolete. While a lot of surgeons continue to operate under general or spinal anaesthesia, we know that local anaesthesia and tumescence are effective, comfortable for the patient and easily performed by the surgeon. They are considered safer then general anaesthesia, but still may induce local or systemic adverse reactions. It is important that surgeons are able to recognise and adequately treat these potential complications.

THERMAL OR GLUE TECHNIQUES

Treatment of varicose veins using steam pulses

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Steam is the latest of the thermal endovenous techniques to enter clinical use. It was introduced in 2008 as a cheaper but as effective alternative to laser and radio-frequency. The principle is to inject in the vein pulses of water vapors at 120°C, each pulse delivering 60 joules of energy in the lumen. Steam is injected under pressure: the first pulse dislodges the blood, the next ones heat the vein wall. A stainless steel catheter of 5F gauge is used, it is flexible enough to navigate through tortuosities without using a guide wire. Two lateral holes close to the tip eject the steam, avoiding the risk of heating deep veins when heating the junctions.

A comparative animal study by S.Thomis and all[1] showed that immediate shrinking was more pronounced with steam than with Closure Fast®radio frequency catheter and 1470 nm TULIP fiber® laser. Perivenous damage was less seen, although the number of cases was not sufficient to obtain statistical significance.

R.Milleret[2] published the results of a multi center study performed in France. Obliteration rate at 6 months was 96 %. A multicenter study of tributary ablation showed, with less pigmentation and inflammatory reactions than after foam sclerotherapy with 97% closure rate at 6 months.

A second generation device allows elective ablation of tributaries and reticular veins (Miravas®)

In conclusion, steam ablation is a safe alternative to other thermal techniques, it can be applied to tortuous or superficial veins which could not be treated by laser of radio frequency.

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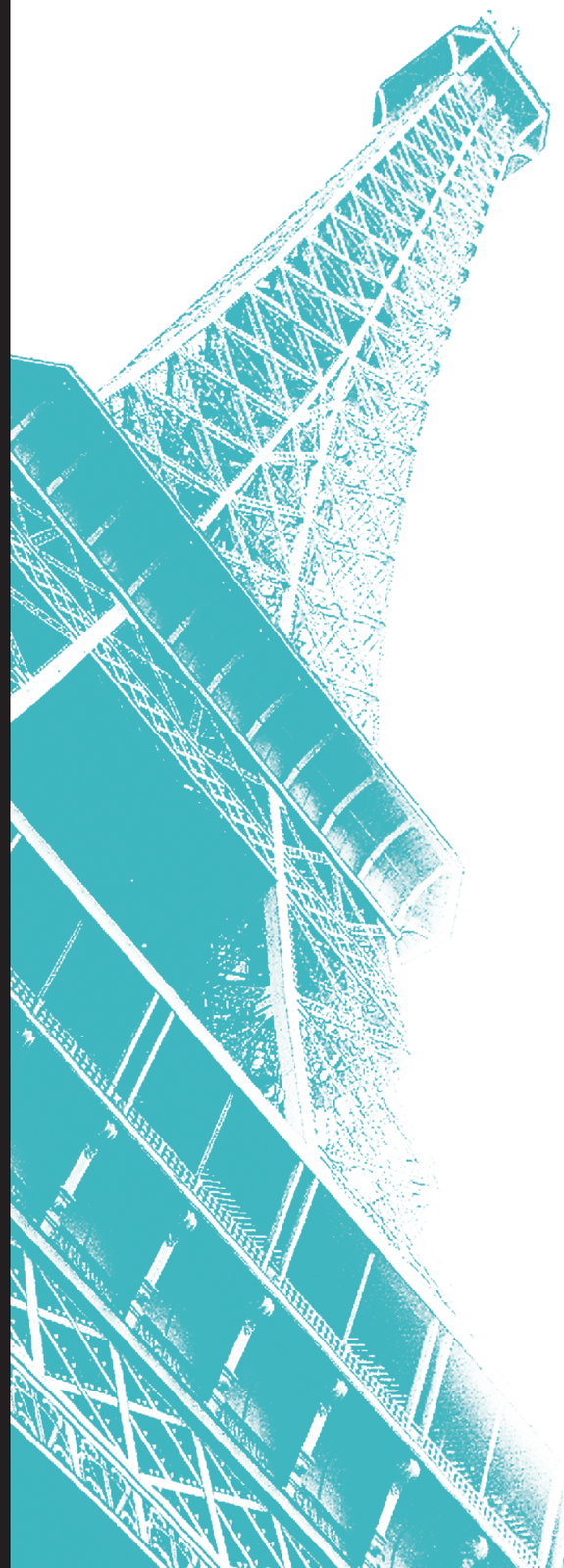
CONTROVERSIES & UPDATES IN VASCULAR SURGERY



EPOSTERS

ANEURYSM

Vein covered stentgraft repair of mycotic aortic aneurysms - a case report with ten year follow up

Claire Dawkins, Klaus Overbeck, Simon England, Andrew Brown
Sunderland Royal Hospital, Sunderland, United Kingdom

INTRODUCTION

Conventional treatment of mycotic aortic aneurysms involves open surgical repair requiring a laparotomy and either in-situ repair or ligation and extra-anatomical bypass using prosthetic grafts or autologous vein. The mortality is as high as 35% with a high incidence of further infective complications. Recently prosthetic endovascular stent grafts have been used with mixed results. Placing prosthetic material into an infected site remains controversial and lifelong antibiotic therapy is required in most cases. Vein covered stents may provide an endovascular option for autologous repair.

CASE SYNOPSIS

A 73-year-old male was admitted with a three week history of malaise, rigors, abdominal and back pain. He had undergone a sub-total Roux-en-Y R2 gastrectomy and a anastomotic leak with abdominal sepsis treated by open drainage and a laparotomy with MRSA growing from a central line. CT showed a 4cm infra-renal pseudo-aneurysm, 2.6cm below the lower left renal artery with a 1.8cm diameter neck and peri-aortic inflammation. This increased in size despite antibiotic therapy. Due to his hostile abdomen and co-morbidities he was deemed unfit for open surgery. Ethics approval was obtained to treat him with a vein covered stent. The right SFV was used to construct a spiral graft and sutured onto 2 overlapping Palmaz stents. The stentgraft was crimped onto a 20mm angioplasty balloon and introduced into the patient's aorta inside a shuttle balloon via a right femoral cutdown. The stentgraft was deployed across the aneurysm neck with on-table angiogram showing no endoleak. Post-op recovery was unremarkable and the patient discharged on the 9th post-op day on oral Linezolid and Ciprofloxacin for 4 weeks. At the 1, 5 and 10 year point CT follow up shows the vein-graft intact and unchanged with aneurysm excluded.

CONCLUSION

Vein covered stents may be a effective and durable endovascular treatment of some mycotic aortic aneurysms.

ANEURYSM

Aneurysm of the most proximal (medial) branch of the Profunda Femoris Artery

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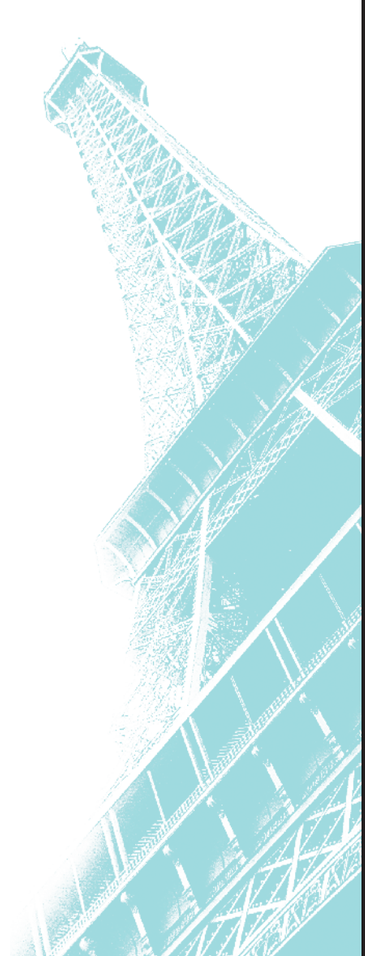
2. BSc MBChB PhD FRCSI FRCS

True Profunda Femoris Artery Aneurysm (PFAA) is a very rare condition estimated to present only 0.5% of the peripheral aneurysms and 1-2.6% of femoral aneurysms. Although, it is relatively uncommon amongst all femoral artery aneurysms (1-2.6 %), it is more likely to rupture than other peripheral aneurysms. In this case report we are presenting a very rare case of aneurysm of the most proximal (medial) branch of the Profunda Femoris Artery in an 85 years old male. Successful surgical ligation was performed with no complications related to surgery at two years follow up.



ANEURYSM

Persistent endoleak type II treated with Onyx LES (liquid embolic system): a case report

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OBJECTIVE

Demostrating as in any case the availability of liquid embolic system is unique way to resolve persistent type II endoleak, causing progressive enlargement of the aneurysmal sac, after other devices failures.

MATERIAL AND METHOD

A 79 hears old woman underwent EVAR with an aorto-left uniliac device, a plug on the right iliac artery and a femoro-femoral bypss, having a 55 mm infrarenal aortic aneurysm and a 33 mm right common iliac aneurysm, in February 2014, with apparent good result immediatly.
After 1 month: evidence of type II endoleak on CT scan from IMA and from a couple of lumbar arteries.
After 12 month: persistence of type II endoleak and also 2 mm enlargement of sac diameter. So we perform a left hypogastric coils embolization and, secondary, surgical clip closure of IMA with mini laparothomy.
After 15 month: persistence of endoleak and also 12 mm enlargement of sac diameter. We decided to undertake a straight follow up till, after 28 month, another CT scan shown an enlargement of the AAA until 68 mm maximum diameter in persistent type II endoleak.
In July 2016 we performed embolization of the aneurismal sac with 8 ml of Onyx LES through Progreat microcatheter introduced between the endoprosthesis and the wall artery at distal neck point. We complete the procedure releasing left external iliac endoprosthesis extension to stabilize distal sealing.

RESULTS

By liquid embolic system we got an optimal angiografic result, no more type II endoleaks immediatly and also at 3 month CT scan.

ANEURYSM

Blood loss and an open approach increase length of hospital stay in patients undergoing abdominal aortic aneurysm repair

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OBJECTIVE

Abdominal aortic aneurysms (AAA) are often detected incidentally whilst screening for other pathology. With ongoing follow-up, they are more frequently repaired electively, either via an open or endovascular approach. This study investigated surgical factors affecting the duration of in-hospital stay in patients undergoing AAA repair.

METHODS

We retrospectively analysed the data of AAA repairs at a regional public hospital. 163 patients were identified from the Australasian Vascular Audit having undergone AAA repair between the 1st January 2010 and 20th September 2015.

RESULTS

80.3% of patients were male with the average age at operation 74.5 years and mean body mass index of 27.9 kg/m2. 86 of the patients had an open repair (28 emergency cases) with the remainder treated endovascularly. The average duration of stay for all AAA repairs was 10.5 days – this excluded four patients who died whilst in hospital. The average duration of stay was longer for open AAA repairs (14.9 days) compared to endovascular repair (5.5 days) ($p < 0.05$). Patients with an estimated intra-operative bloodloss of less than three litres had a mean duration of in-hospital stay of 9.3 days, compared to 35.5 days for estimated intra-operative blood loss of more than three litres ($p < 0.05$).

CONCLUSION

From this data, the two most significant factors affecting duration of hospital stay after AAA repair are blood loss in excess of three litres, and an open approach. Excessive blood loss can result in a prolonged stay by over 20 days, adding significant hospital costs and additional burden on healthcare resources.

ANEURYSM

Totally percutaneous aneurysm sac embolization during endovascular aneurysm repair

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PURPOSE

To describe an optimization of a previously described intraoperative sac embolization technique for prevention of type 2 endoleak-related complications during endovascular aortic repair (EVAR).1,4 The proposed adjustment of the technique makes feasible the treatment with a totally percutaneous approach using the Excluder stent-graft.

TECHNIQUE

Percutaneous access of common femoral arteries is obtained and two suture-mediated closure systems are placed on each side. A 16 or 18F sheath is placed for delivery of the Excluder trunk-ipsilateral leg component and a 16F sheath is used on the contralateral side. Standard placement of the endoprosthesis main body is performed. The contralateral leg component is delivered to the intended position and then a 0.035" hydrophilic standard guidewire is placed into the aneurysm sac through the same 16F sheath (Figure 1). Then a 5F straight 65-cm length catheter is advanced over the standard wire into the aneurysm sac, in a parallel fashion with the contralateral leg (Figure 2). To enhance fluoroscopic visualization, a 5-F calibrated pigtail catheter cut 1 mm beyond the proximal radiopaque marker (Figure 3) can be substituted for the diagnostic catheter. The contralateral leg is deployed, the standard guidewire is removed and some coils are released though the 5F catheter into the aneurysm sac, followed by injection of 5 to 10 ml of double-component fibrin glue. Up to December 2016, the technique has been applied in 21 patients. No complications were recorded. Ten patients have follow-up at 6 months, and 5 patients completed 12-months follow-up: persistent type II endoleaks, with no growth of the aneurysm sac, is still present in 3 and 1 patients respectively.

CONCLUSIONS

Nonselective sac embolization during EVAR is safe and feasible.3,4 To our knowledge, this is the first description of a totally percutaneous approach, with a single access on each femoral artery: it could be helpful to physicians who wish to perform intraoperative sac embolization, without relevant changes in their usual EVAR procedure.

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ANEURYSM

Prevention of type II endoleak: role of evas technique in comparison to sac embolization technique in case of abdominal aortic aneurysm treatment

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INTRODUCTION

The goal of this retrospective study was to compare endovascular intraoperative aneurysm sac embolization in endovascular aneurysm repair (EVAR) with the endovascular aneurysm sealing technique (EVAS) to reduce and prevent type II endoleak (EII).

METHODS

Between January 2012 and March 2016, 154 patients underwent an endovascular treatment for an abdominal aortic aneurysm.
Three groups were considered: 64 patients (41,5%) underwent EVAR with intraoperative sac embolization (Group A), 40 patients (26 %) underwent EVAS technique (Group B) and 50 patients (32,5 %) underwent standard EVAR (Group C).
The number of patent aortic side branches (inferior mesenteric artery, lumbar arteries, accessory renal arteries), sac thrombus and the sac volume were considered important parameters to define the high risk patients for type 2 endoleak.
Measurement of intrasac aneurysm pressure was performed during EVAR procedure in group A and C to evidence the presence of blood flow as an empirical parameter to determine the presence of an endoleak after the endograft release .
Angio-CT scan follow-up was perfomed at 1,6,12,24 months.

RESULTS

The 30 days angio-CT scan revealed a significantly higher incidence of EII in group C than in group A (14% *vs* 4,6 %).
The EII incidence was not stastistically significant in group A than in group B (4,6 % *vs* 2,5%) .
At 22 months follow up (range, 6 months to 4,3 years), group C has a significantly higher rate of EII in comparison with group A (12% *vs* 4,6%) and group B (12% *vs* 0%).
Furthermore group A has an higher incidence of type 2 endoleak than group B (4,6% *vs* 0%) .
In group B freedom from EII-related reintervention was 100%.
Freedom from EII-related reintervention was higher in group A than in group C (93% *vs* 90%) .

CONCLUSION

Although a prospective randomized study is necessary, EVAS technique represents a valid alternative to the intraoperative sac embolization in EVAR procedures to prevent EII and its complications in the short and midterm follow-up in high risk patients for EII.

ANEURYSM

The Successful Treatment of a Proximal Type I Endoleak using the Aptus HeliFX EndoAnchor System

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BACKGROUND

Endovascular aneurysm repair (EVAR) is safe, effective, and the preferred treatment for managing infra-renal abdominal aortic aneurysms[1-2] (AAA). Endoleaks remain a common complication and are the most frequent re-intervention indication[3-4]. Type I endoleaks are associated with rupture and warrant treatment. We report a case of treatment of a proximal type I endoleak using HeliFX EndoAnchors (Medtronic).

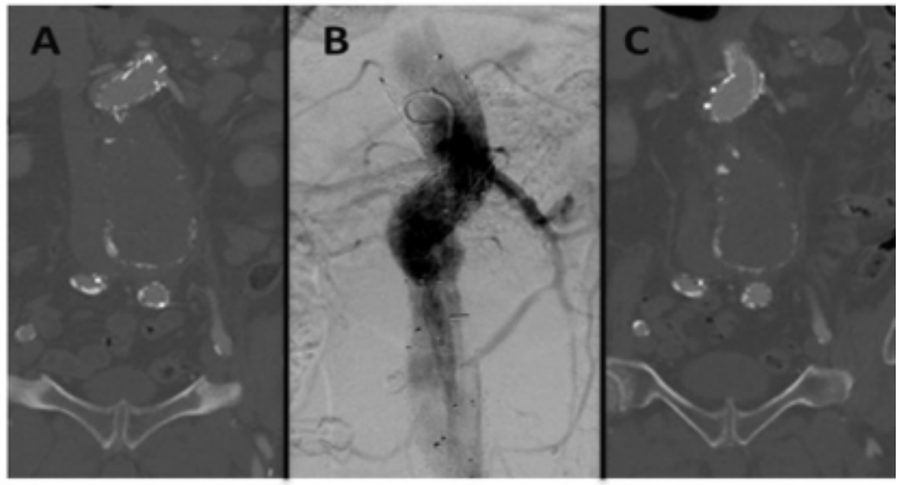
CASE REPORT

An 85-year-old male presented with symptoms of acute left leg ischaemia. Computed tomography angiography (CTA) imaging showed mobile thrombus at the left femoral bifurcation and an incidental 6.8cm infrarenal AAA. Lower limb perfusion was successfully restored with surgical embolectomy. The patient proceeded to elective EVAR one month later with the placement of a Medtronic Endurant endograft (Medtronic, Minneapolis, MN). Post-deployment imaging demonstrated good proximal sealing of the endograft. One-month post-procedure CTA demonstrated a posterior, proximal type I endoleak. Planned re-intervention with a proximal cuff extension was precluded by the highly angulated neck. A trifecta therapeutic strategy included prolonged balloon moulding of the proximal neck, direct graft fixation to the aortic wall using EndoAnchors, and final scaffolding with a stent.

The common femoral arteries were accessed percutaneously, followed by an initial five minute period of proximal endograft balloon moulding with a Reliant balloon (Medtronic). Eight EndoAnchors were deployed circumferentially at the level of the proximal endograft. The aortic neck was further scaffolded with a 32 x 80mm uncovered stent (Optimed sinus XL). Follow-up CTA at one and six months showed no residual endoleak.

CONCLUSION

Endoanchors provide an additional treatment strategy for managing type I endoleaks. They have a role in both re-intervention and primary EVAR with hostile aortic neck anatomy. Early results[5] support their use but further studies are needed to evaluate long-term durability and re-intervention rates. Endoanchors appear to be safe and effective and their use can be expected to increase.



Interval CT imaging: A) One month CTA demonstrating type-1 endoleak B) Aptus Endoanchor deployment with no evidence of endoleak C) One month follow-up CTA showing resolution of endoleak

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ANEURYSM

Anatomical suitability of ruptured infra renal abdominal aortic aneurysm for endovascular repair as a first option

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INTRODUCTION

Endo Vascular Aneurysm Repair (EVAR) for ruptured infra renal abdominal aortic aneurysms (rAAA) is proven to provide short term benefit compared to open surgical repair (OSR). Anatomical considerations are the main factors limiting patient suitability for EVAR. In our institution we have an EVAR 1st option protocol for ruptured AAA. We analysed the CT angiography images and the clinical outcomes of all rAAA who underwent surgical repair in our practice over the past 5 years to determine the efficacy of this EVAR 1st protocol and its applicability.

METHODS

A retrospective analysis was carried out for pre-operative CTA images and mid term results of all rAAA patient who received surgical repair either EVAR or OSR between October 2010 and December 2015. Primary end points were anatomical suitability for EVAR, technical and 30 days clinical success. Secondary end points were mid term mortality, hospital and ICU stay, and complication rate.

RESULTS

18 patients were identified. Mean age was 74 years (Range 58 – 89). Mean aneurysm sac size was 81 mm (Range 53 – 114). 16 patients (89%) were anatomically suitable for EVAR according to instructions for use, and 2 we not (11%). 17 patients received EVAR (95%) and 1 had OSR (5%). 1ry technical success was 89%. 30-days mortality was 27.7%.

CONCLUSION

EVAR as a 1st option protocol for rAAA is effective and can accommodate most of the patients reaching operative theatre. A larger number of patients can be fitted in the protocol under experienced hands and by adopting a more flexible approach to instructions for use.

ANEURYSM

Endovascular Management of a large iliac artery pseudo-aneurysm caused by a failing hip replacement prosthesis, case report and technical challenges

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INTRODUCTION

Pseudo-aneurysm of the external iliac artery is a rare but serious vascular complication of total hip arthroplasty. They are reported to have 7% mortality and 15% incidence of limb loss.
Covered stent graft for infected pseudo-aneurysms are reported in literature. Antibiotic cover is required for 3 months post-op

CASE REPORT

A 65 years old male presented to our services with a one-week history of severe right hip pain and large pulsating mass in right iliac fossa. He had history of Acromegaly, cardiomyopathy, atrial fibrillation and previous bilateral hip replacement surgery with one revision on the left side and three revisions on the right side, last one done two years ago. He also had left below knee amputation after an episode of delayed acute ischemia and ICU admission post arrest one year ago.
CT Angiogram showed large 10 cm pseudo-aneurysm of the right iliac artery, with failed hip prosthesis eroding through the hip bone.

The patient was vitally stable, with no clinical or laboratory evidence of infection. Endovascular approach was adopted. Balloon control of the aorta was secured through left femoral access. Ante grade and retrograde angiogram was performed to identify the neck of the aneurysm which was obscured by the hip prosthesis. A covered stent graft was deployed across the left external iliac artery to seal the pseudo-aneurysm. Completion angiogram and follow up CTA showed complete sealing of the aneurysm.

DISCUSSION AND CONCLUSION

Failing old hip replacement prosthesis can lead to life threatening complications. Choice of surgical approach and pre-operative planning is of paramount importance to reduce morbidity and mortality.

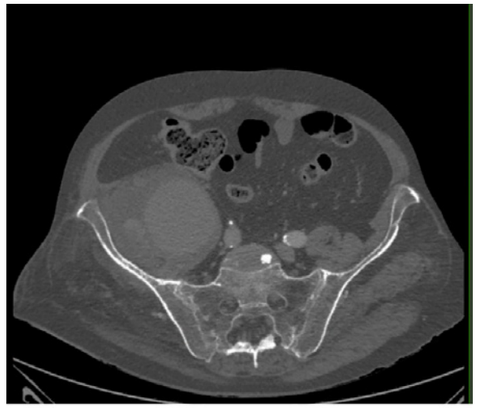

Fig 1a : CTA showing 10 cm pseudo-aneurysm of right iliac artery

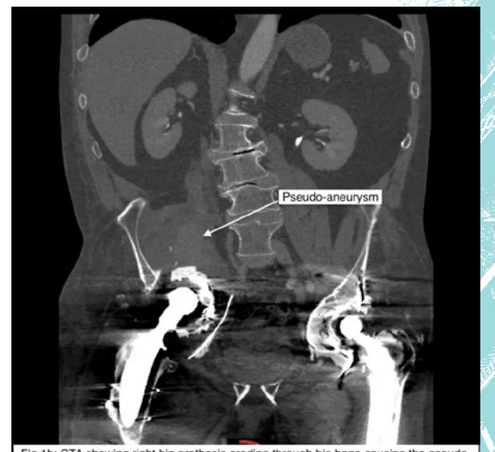

Fig 1b: CTA showing right hip prothesis eroding through hip bone causing the pseudo-aneurysm

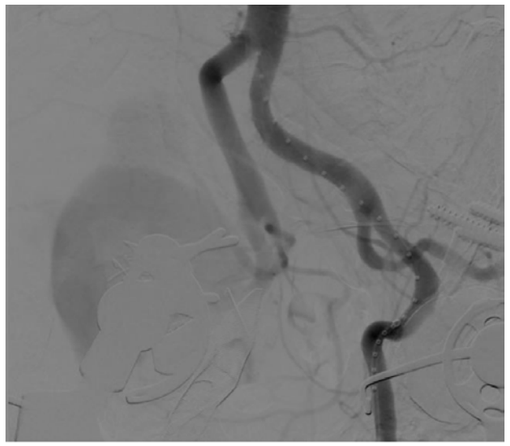

Fig 2a: Intra-op angiogram showing pseudo aneurysm-obscured by hip prosthesis

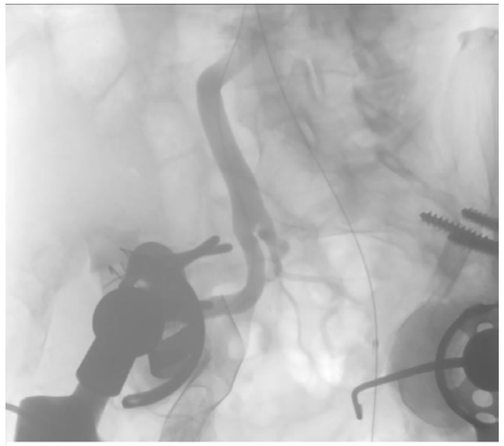

Fig 2b: Completion angiogram showing complete sealing of the pseudo-aneurysm

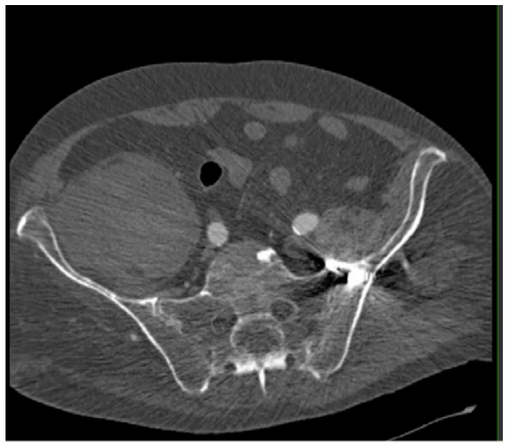

Fig 3a: Follow-up CTA showing complete sealing of the pseudo-aneurysm

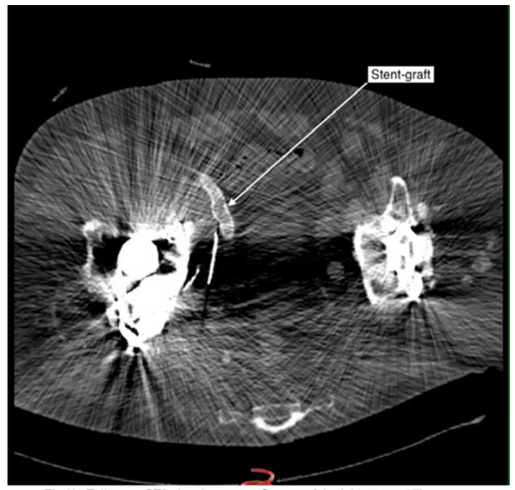

Fig 3b: Follow up CTA showing patent Stent-graft in right external iliac artery

ANEURYSM

Huge abdominal aortic aneurysms, an ever lasting challenge for EVAR? Case series and literature review

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INTRODUCTION

Endovascular aneurysm repair (EVAR) is becoming the preferred treatment strategy for AAA worldwide. Several large RCTs have demonstrated early survival benefits when compared to open surgical repair. Anatomic suitability represents the main factor that can restrain endovascular repair. Recent development in EVAR devices allows to accommodate more difficult anatomies. Huge AAA often has hostile anatomical features that can render EVAR a non-feasible option.

METHODS

A retrospective analysis of all infrarenal AAA surgeries carried out in Mansoura University hospital, which is a tertiary referral center for vascular surgery covering about 15 millions population, was carried out to determine the anatomical features of AAA with a sac diameter of 10cm or more, and they were assessed for suitability of EVAR within IFUs.

RESULTS

Between January 2015 and August 2016, 11 out of a total of 39 AAA interventions were Identified to be done for AAA with an aneurysm size of 10 cm or more. All cases identified were not anatomically suitable for EVAR within IFUs of commercially available devices. Open Surgical repair was carried out for all cases. 30 days mortality was 0.09 (N=1). The main anatomical factor preventing EVAR within IFUs was neck length (73%, N=8, P= 0.032), Neck angulation (55%, N=6, P= 0.048) and neck diameter more than 32 mm (36%, N=4, P=0.05).

DISCUSSION

Absent screening programs in developing countries leads to delay in diagnosis, with larger aneurysm sizes at time of discovery. Huge aneurysms (more than 10 cm) tend to have more difficult anatomy, as the aneurysm grows in 3 dimensions leading to increasing tortuosity and landing zone dilatation. Even with successful EVAR outside the IFUs, aneurysms with hostile anatomy has more incidence of post-operative endoleak, and late mortality.

CONCLUSION

Huge aneurysms tend to have hostile anatomy, not suitable for EVAR

Screening programs for AAA are mandatory to decrease late diagnosis with more incidence of huge sized aneurysms. Open repair will continue to have an important role in the upcoming future, specially in developing countries, where more sophisticated techniques are still very costly.

ANEURYSM

EVAR *versus* Open Repair of Ruptured Abdominal Aortic Aneurysm in England 2002-2015

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INTRODUCTION

Ruptured abdominal aortic aneurysm (rAAA) is a common vascular emergency; the immediate post-operative mortality from emergency repair has remained high with some studies reporting 50% mortality. In this study using the administrative dataset of the National Health Service (NHS) in England, we examined post-operative in-hospital mortality associated with EVAR and open repair of rAAA.

METHODS

Hospital episode statistic (HES) inpatient datasets were extracted from the 1st of April 2002 to 31st March 2014. Patients below the age of 16, duplicated episodes and those with missing admission dates or episode end date were excluded. Using appropriate ICD-10 & OPCS-4 codes all the episodes of EVAR and open repair of ruptured AAA were identified and all the relevant episodes within the same admission were combined to it to generate admission level data set. These index admission data were analysed for in hospital mortality.

RESULTS

In total 17190 patients received surgical intervention for ruptured AAA in England from April 2002-March 2015. 1863 (10.8%) underwent endovascular repair of ruptured AAA and 15327 (89.2%) had open repair. and the. EVAR was associated with a lower mortality rate when compared to open repair (Figure 1). Majority of patients with rAAA were between the ages of 70-79, however the proportion of patients older than 85 years presenting with rAAA increased overtime (Figure 2) and the average mean age of patients increased 1.06 years from 2002-03 to 2013-14. The mean annual number of patients undergoing surgical management for rAAA from 2002-03 to 2013-14 is 1324 patients (95%CI 1309.2-1338.3), 83.4% of all the patients were male. The mortality among female remain higher than male patients presenting with rAAA (Figure 3).

CONCLUSIONS

Open repair of rAAA is associated with higher mortality rates among all age and gender groups when compared to EVAR, although some of the differences in mortality may be due to differences in case-mix. The introduction of AAA screening did not decrease the annual number of rAAA cases. Incidence and mortality among older patients is increasing and the mortality rates among female patients remain persistently high compared to male patients.

FIGURE I
Mortality rate difference between EVAR & Open Repair of rAAA 2006-07 to 2013-14

Year	Rate difference	p-value	
	EVAR vs Open Repair		Confidence Interval
2006-07	-0.30	0.020	(-0.51 - -0.08)
2007-08	-0.32	0.008	(-0.53 - -0.1)
2008-09	-0.15	0.203	(-0.36 - 0.06)
2009-10	-0.21	0.032	(-0.41 - -0.01)
2010-11	-0.22	0.041	(-0.43 - -0.01)
2011-12	-0.26	0.011	(-0.46 - -0.06)
2012-13	-0.15	0.111	(-0.32 - 0.03)
2013-2014	-0.22	0.004	(-0.38 - -0.05)

FIGURE 2
Percentage of Ruptured Aneurysms by Age (Years) from April 2002- March 2014

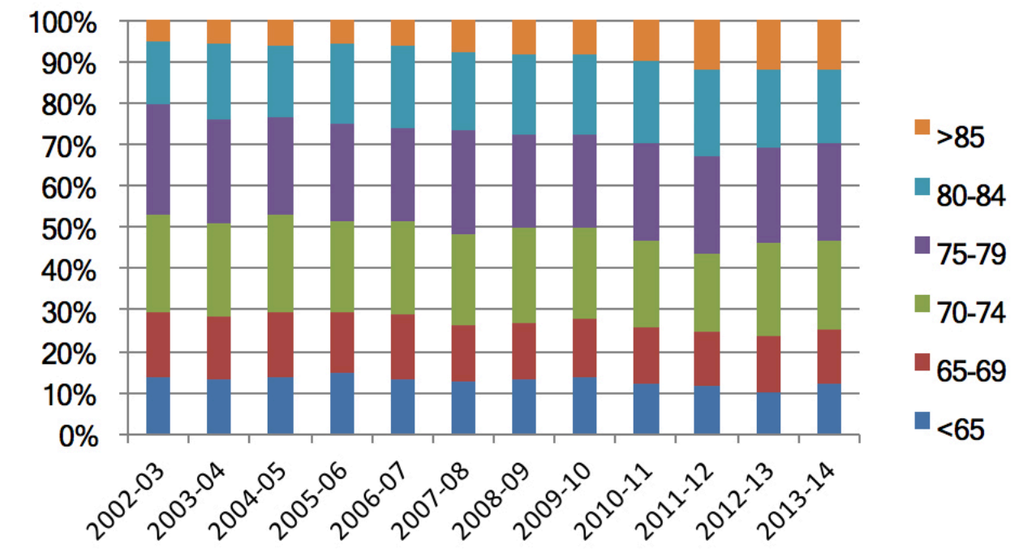
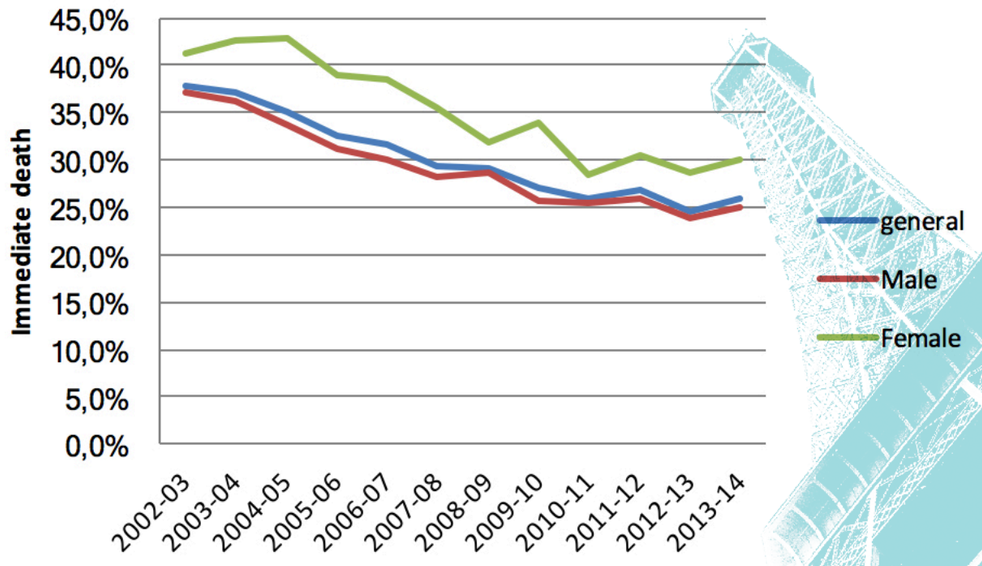


FIGURE 3
Gender Specific Post rAAA repair in-hospital Mortality Rates April 2002- March 2014



ANEURYSM

Endovascular Aneurysm Repair *Versus* Open Repair for Patients with a Ruptured Abdominal Aortic Aneurysm: A Mid-term Cost-effectiveness analysis

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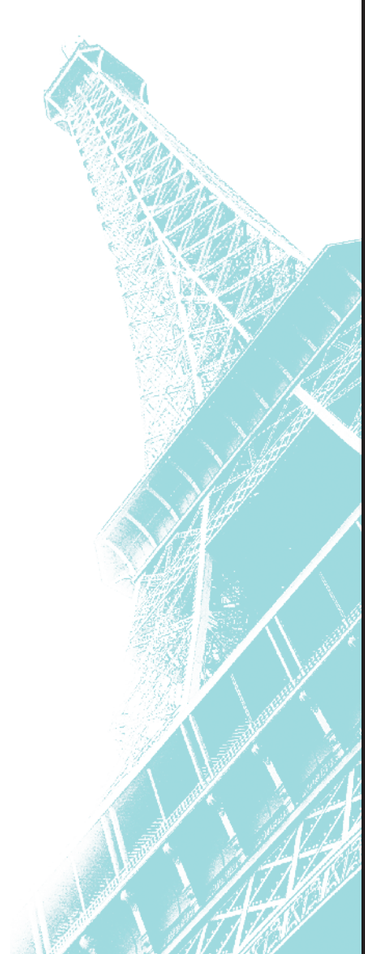
OBJECTIVES
The aim of this study was to analyze the cost-effectiveness of EVAR compared with open repair (OR) in the treatment of ruptured abdominal aortic aneurysms (RAAA).

DESIGN
A model-based cost–utility analysis was performed estimating mean costs and quality-adjusted life-years (QALYs) from the UK National Health Service with a 1-year time horizon.

METHODS
A decision tree model was constructed and populated with probabilities, outcomes and utility data from published literature including IMPROVE, AJAX & NOTTINGHAM trials. The cost data were obtained from the NHS reference costs published annually by the department of health. Probabilities, outcomes for long-term complications were obtained from literature on elective repair of AAA because of lack data for RAAA. This was done so that the economic model captures the effects of post-operative complications on the cost-effectiveness of EVAR and OR. The results from the model were assessed using one-way and probabilistic sensitivity analyses.

RESULTS
The cost of EVAR and open repair combined with the costs of the complications over one year were £5547.9 and £5963.7, the QALYs were 0.493 and 0.498 respectively. Both treatments costs were well below the lower margin of the societal willingness to pay in the UK (£20000) for one gained QALY. The net monetary benefit (NMB) for OR was £3987-10939 compared to EVAR with NMB £4307.5-9235.2. The sensitivity analysis confirmed that both treatment modalities are cost-effective management options at the maximum willingness to pay for a QALY commonly used in the UK.

CONCLUSION
Performing OR on RAAA is a cost effective strategy with a marginally better NMB when compared to EVAR. However both EVAR and OSR cost less than the societal willingness threshold for the QALYs gained.



ANEURYSM THORACIC

Endovascular And Hybrid Treatment Of The Pathologies Of The Aortic Arch: A Single Center Experience

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INTRODUCTION

In the most recent years, thoracic endovascular repair has become the procedure of choice for the pathologies of the aortic arch, due to less morbidity and mortality. Among all, two different techniques are performed in our Unit of Thoraco-Vascular Surgery: the hybrid procedure (TEVAR plus supraortic vessel debranching) and the custom-made total endovascular repair. Both techniques are valuable, but there are pros and cons to both procedures. The aim of our study is to report our experience in the treatment of the pathologies of the aortic arch and to compare it to the most recent literature.

METHODS

From January 2009 until March 2016, 61 patients were treated electively at our Unit of Thoraco-Vascular Surgery for pathologies of the aortic arch, 57 underwent supraortic vessel debranching plus TEVAR, while 4 underwent total endovascular aortic repair: 3 using a custom-made double branched and 1 single branched endovascular graft. All the operations were under general anaesthesia, while rapid pacing was used only during the deployment of the double branched graft. Cerebral fluid drainage was used in none of the patients.

RESULTS

All the 61 patients survived and were dismissed asymptomatic. In the custom-made endovascular group all the patients had excellent outcomes, with a good patency of the graft at 6months and no signs of endoleak. In the hybrid group, there were 3 redo operations, with the completion of LCCA-LSA bypass with a RCCA-LCCA bypass to extent the landing zone. No neurological complications occured in both groups.

CONCLUSION

Both techniques are feasible to our experience and led to successful early results in selected patients. The double branched graft assure a more anatomical reconstruction of the aortic arch, but the global experience still needs to be widened before being able to state conclusions, although the worldwide results are promising. As for the hybrid solution, sometimes an aggressive approach with total debranching is needed to assure a more secure landing zone. This technique is well codifyed at our center and it is always an available option, both in elective and emergent patients, since it is not customade.

KEYWORDS
aortic arch

ANEURYSM THORACIC

False aneurysm of the aortic arch fistilise in the left lung: Case report

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INTRODUCTION

Aneurysmal location in the aortic arch is outstanding, rarer than the ascending aorta. This is a serious condition because of the risk of rupture requiring an emergency surgery. The diagnosis is based on the CTA and MRA. This clinical case is an opportunity for us to recall the seriousness of this disease for the patients, and challenges encountered by the surgeons.

METHODS

We report the case of men, 53 years old, with a history of a 4 meter drop from a building two years ago. Hospitalized for exploration following the discovery of chest X-ray opacity of the upper lobe left lung as a result of hemoptysis average abundance. The suspect image.A .chest angio-CT was performed showing the false aneurysm of the aortic arch. ECG was normal. Laboratory tests showed anemia. The patient was operated on under extra corporeal circulatio, established between the femoral artery and femoral vein with deep hypothermia and circulatory arrest. The surgical approach was a left thoracotomy in 4 left intercostal space. After installing a femoral-femoral CPB and detachment of the left lung intraoperative exploration shows a huge pseudoaneurysm of the aortic arch blocked by the upper lobe of the left lung fistulizing of pseudoaneurysm in the latter. The intervention had consisted after flattening of the pseudoaneurysm in compensation for the loss of aortic substance by a lateral Dacron patch under circulatory arrest and closure of the pulmonary breach.

RESULTS

The immediate postoperative were unfavorable with a fatal refractory cardiogenic shock.

CONCLUSION

Advances in imagery make the angio scanner and the MRA the best exams for detecting false aneurysms of the aortic arch. The indication for surgery is formal in all cases of pseudoanevrysm of the aortic arch because the spontaneous evolution is fatal. In fact, the actual treatment is surgery.

KEYWORDS
false aneurysm, aortic arch, hemoptysis, cardiopulmonary bypass, circulatory arrest

ANEURYSM THORACIC

Aneurysm of the ascending aorta in a 06 years old girl: Case report

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INTRODUCTION

Aortic aneurysm is exceptional in children .It is a serious condition because of the risk of rupture requiring urgent surgery. The diagnosis is based on the CTangio and MRIangio.This case is for us an opportunity to show that children are not save from this disease.

METHODS

We report the case of 06 years old children who present since some months a turgor of jugular vein. CTangio was realized showing the aneurysm of the ascending aorta, tronc innominate artery place left to return to right jugular and vein dilated by compression. Echocardiography: Aortic ring 15 mm, Sinus of valsalva at 19 mm, aorta ascendant at 50 mm. LV:35/21 mm. LV:35/21mm. Chest X-ray: CTI: 0.44 with enlargement of the upper mediastinum .The patient was opered under cardiopulmonary bypass. The approach was sternotomy .The per operative exploration was aortic aneurysm with normal size of sinus .The intervention had after resection of the sus ascending aorta aneurysmal restoration of aortic continuity by Dacron implanted in termino terminale tube.

RESULTS

The suite immediate post operating was unfavorable with death of patient with inflammatory syndrome and vasomotor refractory.

CONCLUSION

The CTangio and MRIangio are the examinations choice in detection of aortic aneurysm.The operative indication is formal in all cases of aneurysms of the ascending aorta. Spontaneous evolution is fatal .in fact there al treatments is the surgery. We note the severity of the inflammatory syndrome in children.

KEYS WORDS
Aortic, aneurysm, children, surgery, and cardiopulmonary bypass

ANEURYSM THORACIC

Acute dissection on aneurysm of the ascending aorta in a Marfan: Case report

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INTRODUCTION

Marfan's syndrome is a rare genetic disease. It is characterized by the achievement of one or several organs may cause problems notably skeletal disorders (big size, scoliosis), ophthalmique (myopia), cardiac (aorta dilatation) .The prevalence of this syndrome is estimated at one person for 5000 births .The goal of this work is to show the gravity of this disease.

METHODS

We report the observation of a young woman aged 36 years at the family history of Marfan (two brothers, major form, mother: minor form) came to the emergency for chest pain who plays for a week with dissection of aorta and aortic insufficiency and left ventricular function correct in echocardiography. AngioCT thoracic: Aortic dissection type A on expansion aneurysmal of sinus 69/67 mm. Chest x-ray; scoliosis. Clinically: We have a marfanoid aspect with signed kyphoscoliosis, anachnodactylie, adolichosteomelie, thumb and wrist myopia and dislocation of cristallin . Biology is correct. The decision of medico chirurgical staff is to challenge this patient given the importance of the chest deformities and altered general status.

RESULTS

Inoperable patient.

CONCLUSION

The announcement of the diagnostic is an integral part of the throughcare process. Management is multidisciplinary and continues. The key elements of the monitoring are the aortic root, the mitral valve, the headset, and the complication musculosquelitiques.

KEY WORDS
Marfan syndrome's, malformation, dissection and aneurysm

ANEURYSM THORACIC

False anastomotic aneurysms: Report case

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INTRODUCTION

False anastomotic aneurysms are exceptional and serious. The most serious complication is breaking, imprivisible and letal.Support for association reference surgical repair. The aim of our work is to remind of this exceptional complication in postoperative.

METHODS

We report the observation of a woman aged 64 years operated from aneurysm of the segments 0 and 1 with benefit from intervention of modified Bentall .The diagnostic was reported in post operating by angiochest CT scan motive by chest pain or there reveal the externalization of control with false aneurysm periprothetique on the proximal anastomosis with increase of the false aneurysm on angiochest CT scan control realized after a week. Procedure per exploration after installation of cardiopulmonary bypass femoro-femoral left and induction of circulatory arrest to 19: big proximal aneurysm with exteriorization of blood from the left atrium roof. The gesture was after evacuation of the hematoma in setting flat of the false anevrysmale after evacuation of the hematoma.stregthening of the anastomosis by point and repair of the roof of left atrium.

RESULTS

The suites immediate operating post were marks by a mediastinitis,endocarditis on aortic prosthesis complicated by acure ischemia of right lower limb to 18 day who benefit from one of the desobstruction by fogarty sensor and death in 20 days by septic shock.

CONCLUSION

False anastomotic aneurysms justify rapid intervention to prevent their rupture. The indication for surgery is formal in all cases of pseudoanevrysm of the aortic because the spontaneous evolution is fatal. In fact, the actual treatment is surgery.

KEY WORDS
False aneurysm, surgery, cardiopulmonary bypass

ANEURYSM THORACIC

Simultaneous Endovascular Repair of a Thoracic Aortic Injury during Posterior Pedicle Screw Removal

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INTRODUCTION

Posterior spinal stabilisation is a technically demanding procedure which is increasing in popularity. Since this increase in popularity, complications, including screws misplacement, are being highlighted. Accuracy rates are higher when imaging modalities are used intra-operatively. Vascular injuries following posterior spinal stabilisation are rare and are usually discovered late on subsequent imaging. Immediate peri-operative compromise is rare, but nonetheless, resultant vascular injuries can be life threatening.

CASE HISTORY

A 72year old lady had a posterior spinal stabilisation for severe pain caused by discitis. Routine CT scan two weeks post-operatively detected an incidental thoracic aortic injury due to a misplaced pedicle screw. Given the rarity of this complication there is no guideline for the management of resultant aortic injuries. Options described in the literature include; thoracotomy with open vascular repair and newer endovascular techniques.
We describe a novel method of simultaneous endovascular repair of a thoracic aortic injury during posterior pedicle screw removal with the patient in the right decubitus position.

CONCLUSIONS

Surgeons operating near high risk vascular structures should use intra-operative imaging modalities to guide screw placement and reduce subsequent complication rates. During endovascular repair of resultant aortic injuries several factors must be considered. In particular, the challenge of turning a patient with open groin access and an endovascular stent in place. This must be carried out with extreme care to avoid the following risks; loss of access, damage to the access vessels and bleeding, displacement of the stent or deployment wires and loss of the sterile field.

ANEURYSM THORACIC

Hybrid thoraco-abdominal aortic aneurysm repair: minithoracotomy approach to perform the anterograde visceral arteries by-pass

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A 77 years old male patient came to our Department for an asymptomatic thoraco-abdominal aortic aneurysm with an high growing rate (1 cm / year) in follow up with angio-CT scan.
The patient suffered from an ischemic heart failure, atrial fibrillation, hypertension, mild chronic renal failure.
Due to the comorbidities, the patient underwent an hybrid thoraco-abdominal aortic aneurysm repair in two stages.
First of all a debranching of the visceral arteries was performed with an anterograde bifurcated by-pass from the ascending aorta to the celiac trunk (CT) with an end to end anastomosis and to the superior mesenteric artery (AMS) with side to end anastomosis.
An hybrid vascular graft was used to perform the left renal artery by-pass with sutureless distal end-to-end anastomosis.
The surgical access for the proximal ascending aortic end to side anastomosis consisted in a mini-thoracotomy approach at the second intercostal space.
Subsequently the bifurcated graft was tunneled through the chest and the diaphragm in the abdominal space supported by video-assisted thoracoscopy.
The postoperative angio-CT scan showed the patency of visceral arteries by-passes, an increase in the abdominal aneurysm diameter and revealed an anomalous origin of the hepatic artery .
3 month later the patient underwent an exclusion of the thoraco-abdominal aneurysm with fenestrated endograft to guarantee the revascularization of the common hepatic artery and the right renal artery.
A 12 months angio-CT scan proved the patency of the visceral arteries and excluded any signs of endoleak.
In conclusion the minithoracotomy approach to the ascending aorta permits to perform anterograde visceral by-pass with high primary patency rate and low post-operative complications in the treatment of thoraco-abdominal aneurysm in high risk patients .

ANEURYSM THORACIC

Early intervention for cerebral malperfusion after hybrid arch repair of an aortobronchial fistula

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3. Department of vascular surgery, az st. Lucas, assebroek, Belgium

A 76-year old woman presented with hemoptoe and a pseudoaneurysm of the thoracic aorta involving the origin of the left subclavian artery. To treat this aortobronchial fistula, a thoracic aortic stent grafting was performed preceded by debranching of the supra-aortic vessels by a carotidocarotidosubclavian bypass in a two-step procedure.
Postoperatively the patient presented headache and hypotension with orthostatism.
Initially her antihypertensive agents were halted. A neurologic and cardiologic investigation, including a transthoracic echocardiography and a CT scan of the head, could not reveal a cause. Four days later she mentioned claudication of the upper extremities and presented transient left-sided hemiparesis when systolic pressures dropped below 160 mmHg.
A selective angiography revealed an overstenting of half of the ostium of the innominate artery with clear flow restriction and an endoleak type Ia, Ib and II. As neurologic events occurred repair was mandatory.
A retrograde preoperative angiography confirmed severe flow restriction in the innominate artery and a chimney stent was put into place (Advanta Atrium 10mm x 58mm). The type II endoleak was excluded by plugging the orifice of the left subclavian artery and the type Ib endoleak was treated by extending the thoracic stent graft. Completion angiography showed no residual endoleaks and restauration of the supra-aortic blood flow.
The postoperative course was complicated by several attempts to extubate due to laryngeal edema and vocal cord paralysis. Nevertheless no ischemic events emerged.
Technique-related issues should be primary suspected when early postoperative abnormalities present themselves. Our case showed that the arch chimney technique is a very valuable option in the event of inadvertent overstenting of a critical supra-aortic branch.

ANEURYSM THORACIC

Elective Management of Descending Thoracic Aortic Aneurysm in England 2002-2015

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INTRODUCTION

The elective repair of the descending thoracic aortic aneurysm (dTAA) is associated with significant risk of mortality and severe morbidity. The patients presenting with dTAA often have other comorbidities, therefore increasing their perioperative risks. The introduction of the less invasive endovascular techniques expanded the number of the candidates for dTAA repair. Population-level knowledge of incidence and outcomes is paramount to improve resource allocation and to guide postoperative management.

METHODS

The purpose of the present study was to investigate the prevalence and mortality associated with the surgical management of dTAA in England. The primary outcome measure was procedure and gender specific inpatient hospital mortality. NHS inpatient hospital episode statistic (HES) data were extracted from the April 2002 to March 2015. Patients below the age of 16, duplicate episodes and those with missing admission dates, end dates were excluded. Using relevant ICD-10 & OPCS-4 codes all the relevant episodes were identified. Trends of elective endovascular and open repair were compared.

RESULTS

Between 2002 and 2015, 2143 patients had elective repair for dTAA in the NHS of England. 1609 (75%) patients had endovascular repair and 534 (25%) had open surgical operation. 67% of all patients were male. The mean post-operative in-hospital mortality within the same admission was 6.8 (95% confidence interval 2.5-9.3) for patients undergoing endovascular repair and 5.7 (95% confidence interval 6.7-4.7) for patients undergoing open repair. The incidence rate of mortality was 14.6% and 3.8% for open and endovascular repair respectively. The mortality incidence rate difference was 0.11 (95% confidence interval 0.06-1.15). Mortality rate among female patients was 7% compared to 3% percent for male patients treated with endovascular operation. Mortality was 17% and 11% for male and female patients undergoing open surgical repair respectively.

CONCLUSIONS

The annual number of elective repair of dTAA increased from five-fold from 2002 to 2015 in England. The dramatic increase is mainly due to the feasibility of elective endovascular repair for patients with dTAA. This technique is less invasive and it is associated with reduced post-operative mortality rates, although some of the differences in mortality may be due to case-mix. Mortality remains high for female patients undergoing endovascular repair. The relatively low number of patients nationally compared to infra-renal aneurysm highlights the need for fewer more specialised centres to reduce mortality and complications rates.

FIGURE 1

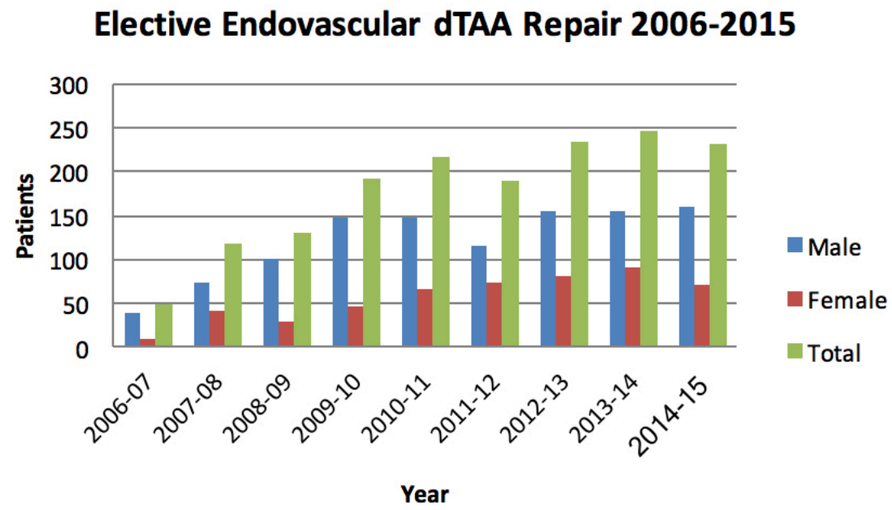
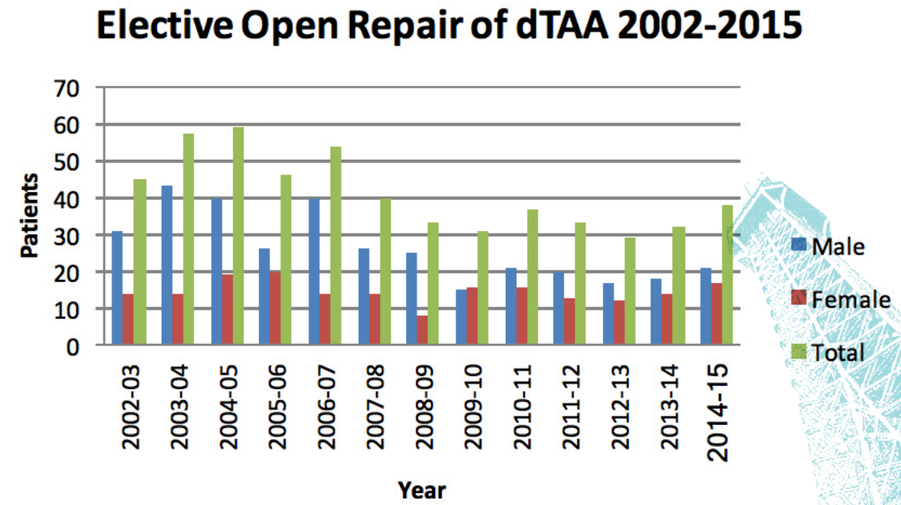


FIGURE 2



CAROTID

Carotid stenting *versus* endarterectomy for treatment of carotid artery stenosis in old age

Eui-Jin Cho, Won-hyung Kim, Sung-Won Jin, Seung-Hwan Lee, Bum-Joon Kim, Sang-Dae Kim, Se-Hoon Kim, Dong-Jun Lim, Sung-Kon Ha
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INTRODUCTION

Carotid stenosis is a major cause of embolic cerebral infarction. Carotid endarterectomy (CEA) is considered an effective treatment for prevention of stroke in patients with symptomatic carotid stenosis. Carotid stenting (CAS) is also considered a potential alternative treatment, but is less invasive than CEA, because it can be done under local anesthesia. Recent studies have found that CEA is superior to CAS with regards to complications such as mortality and stroke rates. In patients who are older, however, there are many factors that can change prognosis. We therefore reviewed our carotid stenosis patients who were given CEA or CAS in old age, and compared prognosis and complications.

METHOD

We reviewed patients who were diagnosed with carotid artery stenosis (over 70%) with symptoms (cerebral infarction, transient ischemic attack) who were over 70 years old. From 2011 to 2014, a total of 43 patients were diagnosed and treated in our hospital. 21 patients were treated by CAS, and 13 by CEA. We reviewed complications such as stroke, myocardial infarction, death and infection with 2 years follow up.

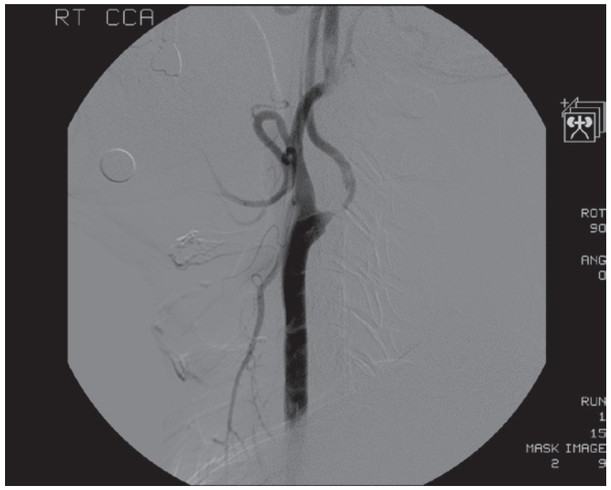
RESULT

We used Chi-square analysis to compare the demographics and prognosis between the CAS and CEA groups. Both groups showed no statistically significant differences in their demographics (Table 1). The prognosis for both groups also showed no difference for stroke, myocardial infarction and death. However, the CEA group showed a higher rate of peri-procedural infection than the CAS group (p=0.037) (Table 2).

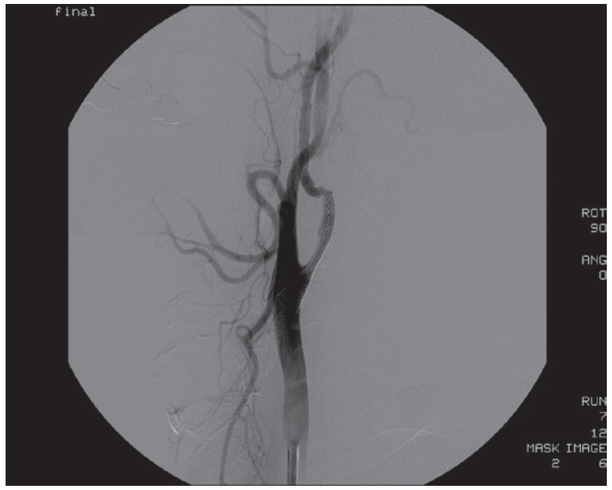
CONCLUSION

Among carotid stenosis patients of old age, both groups underwent successful treatment, but peri-procedural infection rates were higher in the CAS group. With proper infection control and prevention, CAS can potentially be considered a primary treatment choice for carotid stenosis patients of old age.

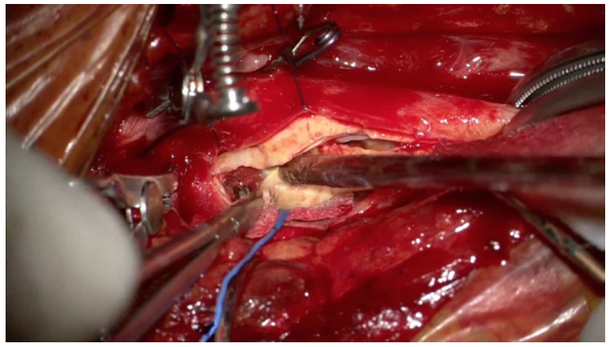
FIGURES



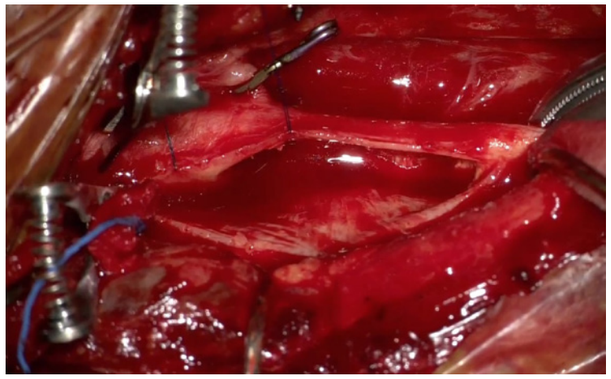
Carotid Artery Stenting Pre-procedure



Carotid Artery Stenting Post-procedure



Carotid Endarterectomy: Intra-operative Thick atheroma was seen and removed



Carotid Endarterectomy: Intra-operative Post removal of atheroma

TABLES

	CAS (n=21)	CEA (n=13)	P-value
Age	76.52	76.54	0.759
Male	13(61.9%)	7(53.8%)	0.643
Diabetes Mellitus	8(38.1%)	5(38.5%)	0.983
Hypertension	19(90.5%)	12(92.3%)	0.855
Hyperlipidemia	17(81.0%)	11(84.6%)	0.785
Current smoking	11(52.4%)	7(53.8%)	0.934
Recent ischemic event			
Transient ischemic attack	7(33.3%)	5(38.5%)	0.761
Hemispheric stroke	6(28.6%)	4(30.8%)	0.891
Modified Rankin scale			
0	9(42.9%)	6(46.2%)	
1	6(28.6%)	3(23.1%)	
2	3(14.3%)	2(15.4%)	
3	2(9.5%)	1(7.7%)	
4	1(4.8%)	1(7.7%)	
5	0	0	

There was no statistical difference between CAS and CEA groups

	CAS (n=21)	CEA (n=13)	P-value
Stroke	2	1	0.855
Myocardial Infarction	1	1	0.724
Death	0	0	-
Periprocedural Infection*	1	4	0.037

* The periprocedural period was defined as within 30 days of index procedure. Periprocedural Infections were consisted of pneumonia, urinary tract infection, blood stream infection, procedural site infection, and so on.

The periprocedural period was defined as within 30 days of index procedure. Periprocedural Infections were consisted of pneumonia, urinary tract infection, blood stream infection, procedural site infection, and so on.

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CAROTID

Carotid endarterectomy under loco-regional anaesthesia in provincial hospital: factors influencing peri-operative outcome and long-term results

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INTRODUCTION

We assess peri-operative outcome and long-term results of carotid endarterectomy realized under loco-regional anaesthesia in provincial hospital.

MATERIALS/METHODS

We reviewed retrospectively carotid endarterectomies under loco-regional anaesthesia realized between January 2007 and December 2013 in provincial hospital. Pre-operative investigated factors were age more than 80 years old (18,1%), arterial hypertension (73,5%), tobacco dependence (56,6%), dyslipidemia (62,6%), diabetes (20,5%), ischemic heart disease (33,7%), peripheral arterial disease (30,1%), symptomatic carotid (30,1%), stenosis ≥90% (51,8%) and occluded controlateral carotid (9,6%). Per-operative investigated factors were use of shunt (65,1%), operative procedure (suture with prosthesis patch 94,0%, eversion 4,8% and direct suture 1,2%) and conversion of loco-regional anaesthesia to general anaesthesia (18,1%).
The relation between the investigated factors and the complications was analyzed by logistic regression for the quantitative variables and by means of the exact test of Fisher for the categorized variables. A multivariate logistic model of regression was also used. The survival curves were estimated by the Kaplan-Meier method.

RESULTS

86 endarterectomies were realized. 29 women had 31 interventions and 54 men had 55. Mean age was 71+/-9 years old. There was one death. 12 endarterectomies had early complications (13,9%). There were 4 strokes (4,7%) and 2 peripheral nerve damages (2,3%). Others morbidities were bleeding (3,5%), mental depression (1,2%), one asymptomatic carotid thrombosis (1,2%) and one non neurological not specified complication. No one of the pre-operative and per-operative investigated factors was predictor of early complication. The multivariate analysis didn't show predictor of early complication. The average survival was 80+/-4 months. Presence of occluded controlateral carotid was the only factor influencing the survival (p=0,0086).

CONCLUSIONS

We didn't find predictor factor of peri-operative complication for carotid endarterectomy under loco-regional anaesthesia. Occluded controlateral carotid was the only factor influencing the survival.
Loco-regional anaesthesia maybe doesn't bring the surgeon in the best conditions to succeed carotid surgery with as less as possible neurological complications.

CAROTID

18F-Fluoride and 18F-fluorodeoxyglucose positron emission tomography after transient ischemic attack or minor stroke: case-control study

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BACKGROUND

Combined positron emission tomography (PET) and computed tomography (CT) can assess both anatomy and biology of carotid atherosclerosis. We sought to assess whether 18F-fluoride or 18F-fluorodeoxyglucose can identify culprit and high-risk carotid plaque.

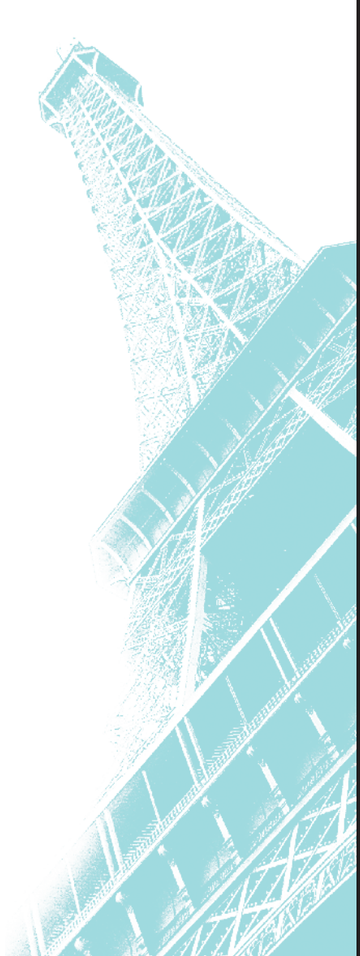
METHODS AND RESULTS

We performed 18F-fluoride and 18F-fluorodeoxygluose PET/CT in 26 patients following recent neurovascular event: 18 patients with culprit carotid stenosis awaiting carotid endarterectomy and 8 controls without culprit carotid atheroma. We compared standardized uptake values (SUVs) in the clinically adjudicated culprit to the contralateral asymptomatic artery, and assessed the relationship between radiotracer uptake and plaque phenotype or predicted cardiovascular risk. We also performed micro PET/CT and histological analysis of excised plaque.

On histological and microPET/CT analysis, 18F-fluoride selectively highlighted micro-calcification. Carotid 18F-fluoride uptake was increased in clinically adjudicated culprit plaques compared to asymptomatic contralateral plaques (log10SUVmean 0.29±0.10 *versus* 0.23±0.11, p=0.001) and compared to control patients (log10SUVmean 0.29±0.10 *versus* 0.12±0.11, p=0.001). 18F-Fluoride uptake correlated with high-risk plaque features (remodeling index [r=0.53, p=0.003]; plaque burden [r=0.51, p=0.004]) and predicted cardiovascular risk [r=0.65, p=0.002]). Carotid 18F-FDG uptake appeared to be increased in 7/16 culprit plaques but no overall differences in uptake were observed in culprit *versus* contralateral plaques or control patients. However, 18F-FDG did correlate with predicted cardiovascular risk (r=0.53, p=0.019) but not with plaque phenotype.

CONCLUSIONS

18F-Fluoride PET/CT highlights culprit and phenotypically high-risk carotid plaque. This has the potential to improve risk-stratification and selection of patients who may benefit from intervention.



DISSECTION AND OTHER PATHOLOGY

Surgery of aortic dissection: Results about 62 patients

R. Lakehal, R. Boukarroucha, F. Aimer, R. Bouharagua, S. Bendjaballah, A. Brahami
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INTRODUCTION

Aortic dissection is a life-threatening emergency, 1% of sudden deaths. Currently, medical imaging diagnosis allows early treatment. We report post operative results of 62 patients operated in our center.

METHODS

During the period of January to 2000 December 2015; 62 patients we reoperated of aorta dissection (62/5760: 1.07%); Including 27 women and 35 men with an average age of 52 years (16-79 years). High blood pressure was observed in 38 patients: (61%).The evolution of the symptoms varied from less than 24 hours to 4 months .NYHA I to IV; Sinus rhythm in 60/62 patients. The cardiothoracic index: 0.5 to 0.78. The diagnosis was made by chest CT scanner and echocardiography: ejection fraction varied from 25.7 to 78% aortic insufficiency in 43 patients grade I to IV; aortic stenosis in 02 patients.

RESULTS

48 patients operated as part of the emergency; Surgery with CPB: Deep hypothermia: 12; Moderate Hypothermia: 28; Normothermia: 22; circulatory arrest in deep hypothermia: 07; femoral cannulation: 58; axillary cannulation: 04.

• Operative procedure:
-BENTALL operation: 03 patients;
-Replacement of ascending aorta: 49 patients;
-Prosthetic Aortic valve replacement + ascending and transverse aorta prosthetic replacement: 03 patients;
-Prosthetic Aortic valve replacement + ascending aorta and the right sinus Replacement+ right coronary reimplantation: 01 patient;
-ascending aorta prosthetic replacement + Prosthetic Aortic valve replacement: 06 patients;

• Aortic clamping: 22-200 minutes; Inotropic +: 26/62 patients; Ventilation varied: 6 hours to 9 days . Intensive Care Unit stay: 0-26 days, Average period of hospitalization: 0-39 days, ICU Complications: 12/62 (19%), Post operative complications: 7/62 (11%); Mortality rate: 11 deaths among 62 patients operated (17.7%).

CONCLUSION

The aortic dissection is a several cardiovascular pathology .The management involves multidisciplinary expertise, Early diagnosis, treatment must be urgent (medical and surgical). Recent advances in medical imaging and surgery largely contribute to a better management of these patients. However, treatment is palliative because it leaves in place a more or less long aorta dissected segment. The risk of secondary ecstatic development of this pathological aorta mandates annual monitoring and clinical imaging .This monitoring allows early diagnosis of secondary complications. In our series results are getting closer to literature data.

KEY WORDS
Dissection, aortic, surgery, cardio-pulmonary bypass.

DISSECTION AND OTHER PATHOLOGY

Supravalvulaire aortic stenosis: Case report

R. Lakehal, R. Boukarroucha, F. Aimer, R. Bouharagua, A. Babouri, S. Bendjaballah, A. Brahami
Department of heart surgery, Ehs El Riadh, Constantine, Algeria

INTRODUCTION

Exceptional congenital heart disease (1 for 26000 birth) characterized by rétrécissement of aortic light. It can be isolated or part of William syndrome .The diagnosis is based on echocardiography. The intervention consists of an aortic root enlargement with Dacron patch. Surgery was indicated if gradient aortic left ventricle Superior of 50 mm hg. This clinical case is for us an opportunity to recall of this type of aortic congenital stenosis .

METHODS

We reported the observation of patient 17 hears old without history presented since one year dyspnea on exersion, palpitation and syncopes. Physical examination: murmur systolic in aortic home without other abnormalities. X ray pulmonary: CTI: 0.48.ECG: RRS with HVL. Echocardiography: supravalvulaire aortic stenosis; mean gradient AO-LV: 46 mm hg, LV – aortic; LV: 48/26 mm + HLV, RV: 20 mm. Exploration per-operatoire: Hipoplasie of the left coronary sinus, anomaly of implantation of antero -external pillar of mitral valve, aortic bicuspidie type 1, absence of coronary anomalies. It has benefit under cardio-pulmonary by-pass an enlargement of the left coronary sinus according to DOTY technique with Dacron patch and conservation of aortic valve.

RESULTS

The immediate post operative suites were favored with gradient aortic –left ventricle drop to 20 mm hg.

CONCLUSION

This is very rare congenital heart disease. Echocardiography remains the key of diagnosis. It must be operated early. The prognostic is enhanced by the advances in surgical techniques. The treatment consists of surgery.

KEY WORDS
Supravalvulaire, aortic, stenosis, cardio-pulmonary bypass.

MISCELLANEOUS

Temporal artery biopsy: an important diagnostic tool or are we wasting our time?

Claire Dawkins, Sophie McGovern, Klaus Overbeck
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INTRODUCTION

Temporal Artery Biopsy forms one of the 5 diagnostic criteria in the American College of Rheumatology guidelines for the diagnosis of Giant Cell Arteritis. However there is a high incidence of negative biopsies that are deemed unreliable due to patients having commenced steroid treatment prior to biopsies.

METHOD

This was a retrospective study of 150 patients who underwent Temporal Artery Biopsy between January 2010 and May 2016. Data collection included the patients' clinical picture, biopsy result, the American College of Rheumatology's diagnostic score both prior to and following temporal artery biopsy and any resulting change in management. Diagnosis for Giant Cell Arteritis was taken from the guidelines of a score of 3 or more from the American College of Rheumatology criteria.

RESULTS

Patients who underwent temporal artery biopsy were found to have scores between 0 and 4. Of those who underwent temporal artery biopsy, the minority were found to be positive. Of those who tested positive only 3 patients were commenced on treatment who had previously not been. Of the majority who had a negative temporal artery biopsy the biopsy result was taken in context with the clinical presentation and the patient's response to surgery and in a few cases the steroids were decreased slightly faster than if there was a greater suspicion of Giant Cell Arteritis from both response to treatment and biopsy result.

CONCLUSION

Our recommendation is to consider Temporal Artery Biopsy in patients where there is a chance of a change in management. Patients with a score of 2, those posing a specific diagnostic conundrum or with treatment difficulties should be biopsied but a blanket Temporal Biopsy of all patients with suspected Giant Cell Arteritis, irrespective of scoring or response to treatment, poses unnecessary surgery and risk to patients in an already struggling healthcare service.

MISCELLANEOUS

Endoscopic lumbar sympathectomy for plantar hyperhidrosis: technique & early experience

Sanjay Singh, Paul Wilson
University Hospital of Morecambe NHS Trust Royal Lancaster Infirmary, Lancaster, United Kingdom

INTRODUCTION

Surgical management of palmar, axillary & facial hyperhidrosis is familar to vascular and thoracic surgeons. Clinicians are often less accustomed to management of plantar hyperhidrosis which is associated with significant morbidity such as skin blistering, bacterial and fungal infection and social stigmatisation. We present a case series of endoscopic lumbar sympathectomy (ELS) performed at our vascular unit for plantar hyperhidrosis.

AIMS

To present our early experience and minimal sympathectomy technique for the management of plantar hyperhidrosis focussing upon it`s efficacy and outcome..

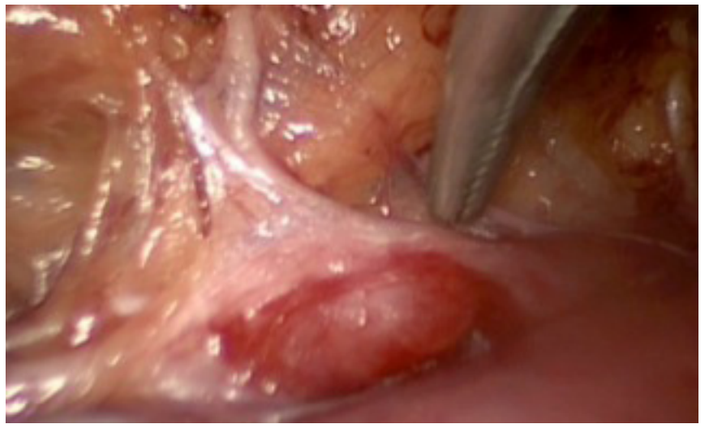
RESULTS

The patients included 8 women and 2 men with ages ranged from 16-43 years. The average duration of surgery was 97 (range 50-150) minutes. There were no intra-operative complications and blood loss was minimal. All patients experienced complete anhidrosis at their first follow up. Two patients developed unilateral post sympathetic neuralgia affecting the thigh and leg. The pain affected the right leg and thigh in both patients and resolved within 6 months. There was no reported ejaculatory dysfunction in the two male patients.

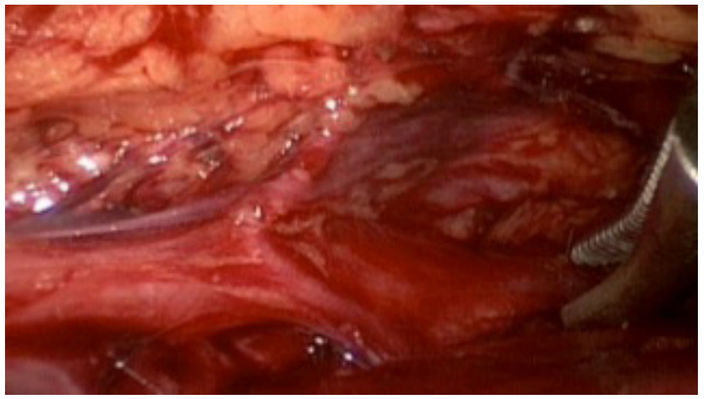
CONCLUSIONS

The surgical management of plantar hyperhidrosis using endoscopic lumbar sympathectomy is in its development and results from case series appear promising, with low morbidity. In our small series of patients, we favoured a 'minimal sympathectomy' (crushing/division of the chain above the L3 ganglia or L3 ganglia ablation) which has resulted in a relatively low rate and extent of compensation sweating with good patient satisfaction. In our early experience the procedure appears to be safe and effective with low rates of compensation sweating and minimal neuralgic morbidity.

FIGURES



The L3 ganglion is isolated



The sympathetic chain proximally and distally is either crushed with two 5 mm clips, or divided with a hook diathermy

MISCELLANEOUS

Periarterial digital sympathectomy: a heroic salvage for severe ischaemia of Raynaud`s

Sanjay Singh, Moatasiem Bukhari

University Hospital of Morecambe NHS Trust Royal Lancaster Infirmary, Lancaster, United Kingdom

AIM

Digital ischemia with ulceration and gangrene can be a manifestation of Raynaud's phenomenon. It is a difficult and frustrating problem to solve. The patients are usually referred to the vascular surgeons when they have already developed refractory ulcers. The current conservative treatment includes pharmacological agents; behavioural modifications and biofeedback therapies. The aim of the present study was to evaluate the outcome of digital sympathectomy for patients with severe digital ischaemia secondary to Raynaud's refractory to medical treatments.

METHODS

We reviewed all digital sympathectomies performed at our vascular unit between 2006-2015. Demographics and outcomes were analysed.

RESULTS

Eleven patients representing 48 affected digits (42 fingers and 6 toes) who underwent digital sympathectomy for severe ischaemia were included in study. Patient ages ranged from 37 to 76 years. Preoperative pain was present in all patients. All patients presented with cold intolerance, numbness and worsening ischemic pain and had proximal vessel disease excluded by arterial duplex scan and were refractory to medical treatments.

Rest pain was resolved in all the patients except in two patients where pain returned in cold environment. Ulcerations and gangrenous areas were healed completely in 92.8% (13/14). The one unhealed ulcer is under surveillance.

CONCLUSIONS

Our study findings demonstrate that digital artery sympathectomy is an effective technique for diminution of pain, healing of ulcers and preservations of the digits. However we accept that multicentric prospective studies with standardized inclusion criteria, timing for intervention and consistent follow up should be performed to evaluate the efficacy and safety of digital sympathectomy. Digital sympathectomy is a heroic salvage and not a futile exercise. We recommend this procedure to be carried out to salvage the digits in both extremities, in those patients who have disabling symptoms such as ischemic pain or ulceration and those who are refractory to medical therapy.

MISCELLANEOUS

Amplatzer vascular plugs in vascular diseases in patients with congenital heart disease (CHD)

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3. Professor, Cardiac Radiology, All India Institute of Medical Sciences, New Delhi, India
4. Additional Professor, Cardiology, All India Institute of Medical Sciences, New Delhi, India

OBJECTIVES

To present the various indications for use of Amplatzer Vascular Plug (AVP) in vascular diseases especially in patients with congenital heart disease (CHD).

MATERIAL AND METHODS

A retrospective review of procedures employing the AVP at our institute between January 2005 and January 2015 was done. AVP is used for embolization and has different models so as to fit different vascular sizes, anatomies and varying hemodynamic situations. Indications for the use of AVP, the type and number of AVP used and follow up details were determined.

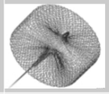
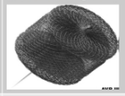
RESULTS

A total of 68 AVPs of all 4 types were implanted in 50 patients. 19(28%) vessels were occluded using AVP type I while 44(65%) received AVP II. Three patients received AVP III while two patient had AVP IV implantation. The major indications for embolotherapy included embolisation of pulmonary arterio-venous malformation (AVM)(n=26) or pulmonary aneurysms (n= 3), coronary and systemic AVM (n=10), aorto-pulmonary collaterals (n=17), closure of patent Blalock-Taussig shunt (n =5), patent ductus arteriosus (PDA) (n=3), and veno-venous collaterals (n =2). Of these, 96% of the plugs could be deployed successfully with occlusion of target vessel. No procedure related or access site complications occurred.

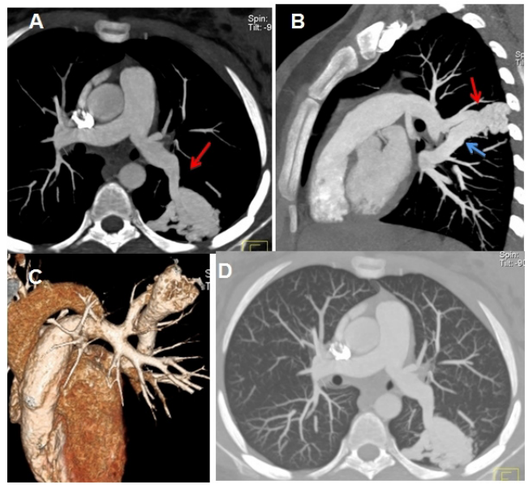
CONCLUSION

AVPs are currently the devices of choice to occlude a variety of vascular communications specially in medium and large vessels where coils are ineffective. AVP II was found to be especially useful in the closure of vessels with high flow.

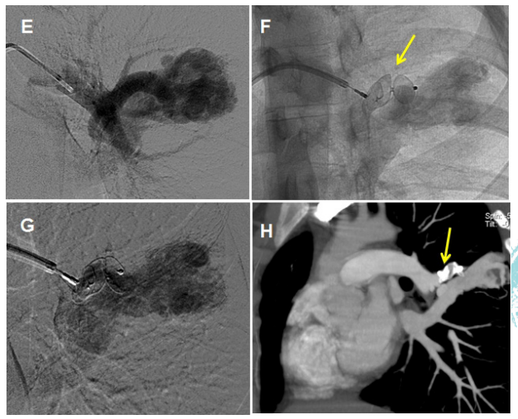
FIGURES

Features	AVP	AVP II	AVPIII	AVP IV
Configuration	Single lobar plug 	Tri-lobar plug with increased length 	Oblong plug with 2 extended rims 	Bilobar plug with small profile 
Sheath (Fr)	4-6	4-7	4-7	4-5
Guide catheter (Fr)	5-8	5-9	6-9	**0.038 compatible diagnostic catheter**
Diameter(mm)	**4–16**	**3-22**	Long axis, 4–14	4–8
Diameter Increments (mm)	2	2	Long axis, 2	1
Length (mm)	7-8	6-18	Short axis, 2-5	10-13.5
Maximum length of delivery (cm)	100	100	120	100
Advantage	Appropriate for short landing zones and high radial force that secures the AVP within the vessel	**Faster occlusion;** minimizes migration and recanalization	Enhances stability in high- flow vessels; fastest occlusion	**Suitable for tortuous and smaller vessels; simple delivery without catheter**

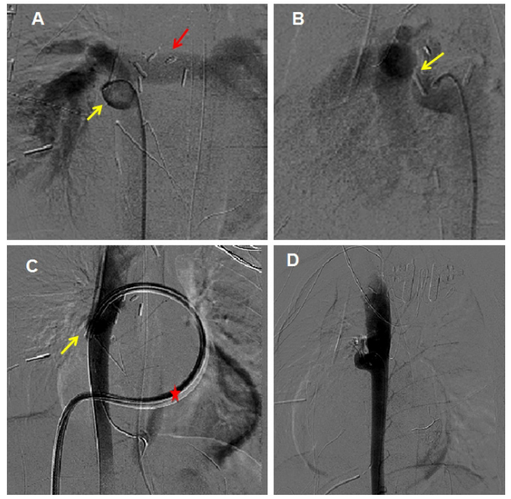
Types of Plugs Table showing types on plugs commercially available



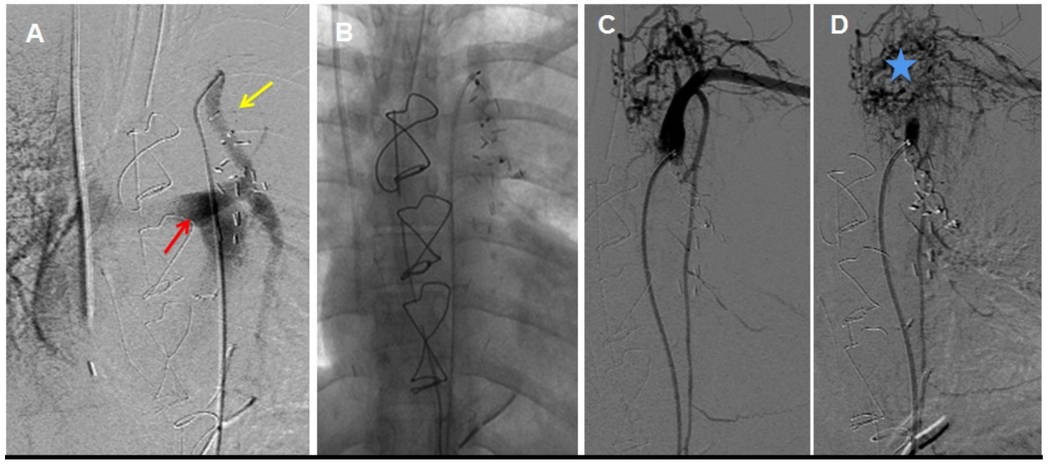
Simple PAVM in a 15 year old child Axial (A) and oblique sagittal reformatted MIP images (B) of CT Angiography show a large AVM in the left lung with a arterial feeder from LPA (red arrow). It drains into the left lower lobe Pulmonary vein (blue arrow). Volume Rendered reformatted image (C) depicting the same. Axial lung windows (D) showed no other parenchymal lung abnormality



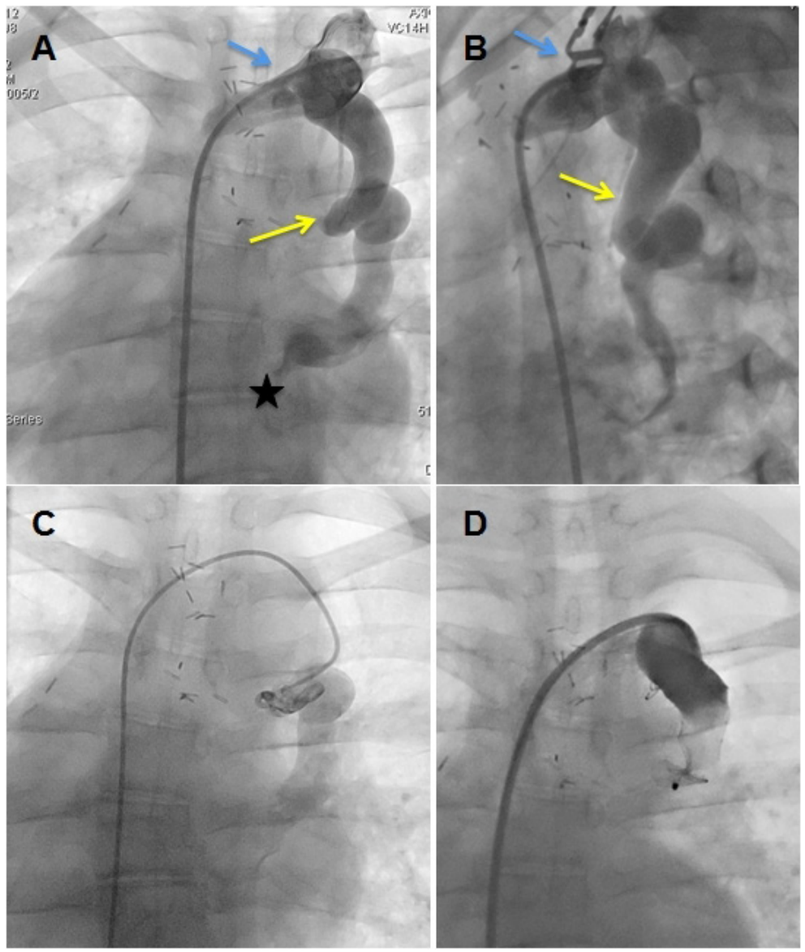
Simple PAVM in a 15 year old child: Selective catheter angiography(E) was done to demonstrate the vascular anatomy followed by deployment (F) of 12mm AVP II (yellow arrow) in the main arterial feeder. Check angiography (G)shows sluggish flow across the AVM. Follow-up CT angiography (H) done after 10 days show no flow across the feeder, and partial thrombosis of the AVM.



Aorto – Pulmonary collateral (APC) embolization for low cardiac output state following correction surgery for Tetralogy of Fallot



Modified Blalock Taussig Shunt (MBTS) embolization: (A) Selective angiogram shows patent left MBTS (yellow arrow) filling the PA (red arrow) (B) 10mm AVP II deployed in the shunt from the aortic side, (C) no flow seen across the BTS, (D) multiple collaterals (blue star) with PA filling were later embolized using coils and gel foam.



Large Veno –Venous Collateral in a patient of post Bi directional Cavo – Pulmonary circulation causing persistent desaturation (A) Antero posterior and (B) oblique view of selective injection into the left innominate vein (blue arrow) shows filling of a large tortuous venous channel (yellow arrow) draining in to the left sided atrial chamber (black star) s/o veno-venous collateral (C) 14 mm AVP II device was deployed into the collateral channel (D) Check contrast injection shows complete flow occlusion across the collateral channel.

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MISCELLANEOUS

Covered Stents *versus* Bare-Metal Stents in Chronic Atherosclerotic Gastrointestinal Ischemia (CoBaGI): a multicenter randomized controlled trial

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– on behalf of the Dutch Mesenteric Ischemia Study group (DMIS)

**Both authors contributed equally*

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INTRODUCTION

Atherosclerotic stenosis of the celiac artery, superior mesenteric artery and/or inferior mesenteric artery can cause Chronic Mesenteric Ischemia (CMI). Revascularization is needed for relief of symptoms as post-prandial pain and weight loss and to prevent acute-on-chronic ischemia, which is associated with high morbidity and mortality.

Endovascular therapy has rapidly increased and replaced surgery as first choice of treatment in CMI. Bare-metal stents are standard care currently, although Oderich *et al.*[1] showed significantly higher patency rates for covered stents retrospectively. A randomized controlled trial is needed to prospectively confirm this finding.

AIM

The CoBaGI trial is designed to prospectively assess the patency of covered *versus* bare-metal stent in patients with atherosclerotic CMI.

METHODS

Patients with atherosclerotic CMI eligible for mesenteric stent placement are randomized for either a bare-metal or covered stent (Advanta V12-Atrium). During follow-up, patency will be assessed with CT-angiography at 6, 12 and 24 months after stent placement. Besides the primary objective of patency assessment, freedom from restenosis, symptom recurrence and re-intervention, quality of life and total costs-effectiveness will also be determined. Patients, researchers and doctors at the outpatient clinic are blinded for the implanted stent during 2 years follow-up time.

RESULTS

Currently, 4 Dutch centers actively participate in this trial. Twenty of 84 patients are included and randomized. Two other centers are awaiting of medical-ethical approval.

Conclusion: Prospectively assessment of the patency of covered *versus* bare-metal stents in CMI is needed. The randomized, patient and investigator blinded CoBaGI trial will provide an answer to this patency question.

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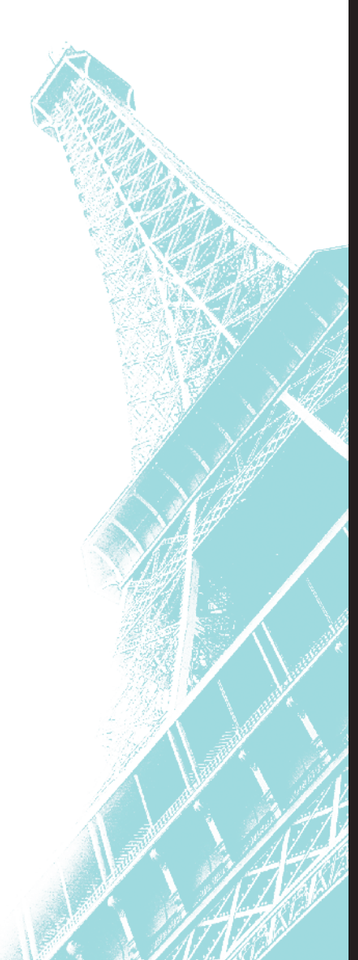

PERIPHERAL

Bypass *versus* angioplasty in severe ischaemia of the leg (basil) trial: a comparison of outcomes in patients randomised to infra-popliteal vein bypass or plain balloon angioplasty

Matthew Popplewell[1], Huw Davies[1], Jyoti Narayanswami[1], Mary Renton[1], Alex Sharp[1], Gareth Bate[1], Smitaa Patel[2], Andrew Bradbury[1]

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2. Birmingham Clinical Trials Unit, Department of Medical Statistics, Birmingham, United Kingdom

OBJECTIVES

To compare outcomes in patients randomised to infrapopliteal (IP) vein bypass (VB) or plain balloon angioplasty (PBA) within the UK NIHR HTA-funded Bypass *versus* Angioplasty in Severe Ischaemia of the Leg (BASIL) trial [1].

METHODS

Interrogation of prospectively gathered data from BASIL case report forms. The primary outcome was amputation free survival (AFS); secondary outcomes included overall survival (OS), freedom from arterial re-intervention, immediate technical success, crossover interventions, and length of hospital stay. Quality of revascularisation was assessed by measurement of pre and post procedural ABPI and time to healing of ischaemic wounds and cessation of rest pain.

RESULTS

The 56 patients randomised to IP VB and the 48 to IP PBA were not significantly different at baseline except for more chronic kidney disease (p=0.007) and non-steroidal anti-inflammatory drug use (p=0.02) in the VB group and more previous surgical arterial intervention (p=0.03) and anti-hypertensive (p=0.04) use in the PBA group (table 1). There was no significant difference in AFS (figure 1), OS (figure 2) or freedom from arterial intervention. Primary technical success was non-significantly higher for VB (86%) than for PBA (73%). Patients undergoing VB enjoyed quicker relief of rest pain (figure 3) when compared to PBA (p=0.005) but there were no significant differences in wound healing (figure 4) or mean improvement in ABPI. Median length of index hospital admission was significantly greater in the VB than in the PBA group (18 *vs.* 10 days, p<0.0001), there was no difference in median total hospital stay between randomisation and the primary end-point (VB 43.5 *vs.* PBA 42 days).

CONCLUSIONS

Further randomised controlled trials, such as BASIL-2 [2] and BEST-CLI [3] are required to determine whether patients with SLI who require IP revascularisation and who have suitable vein for bypass should have VB or endovascular intervention as their primary revascularisation procedure.

FIGURES

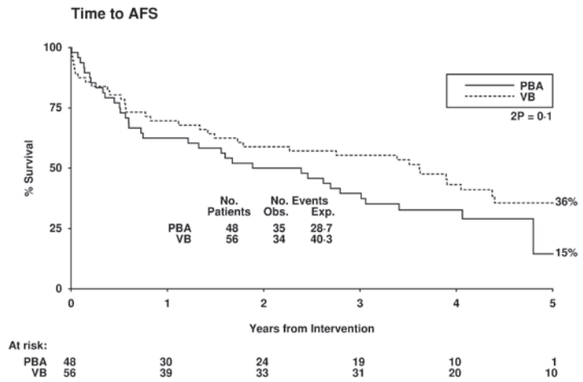

Figure 1. Amputation Free survival out to 5 years

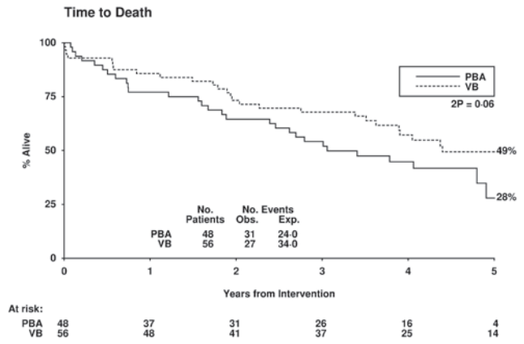

Figure 2. Overall Survival to 5 years

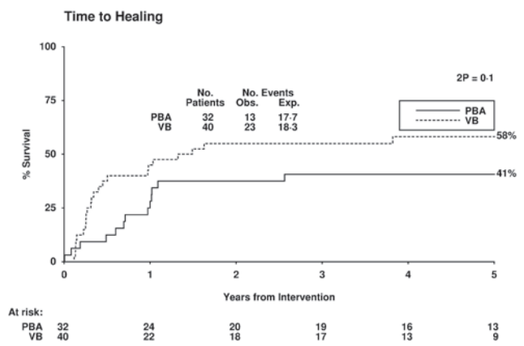

Figure 3. Time to healing of ischaemic wounds

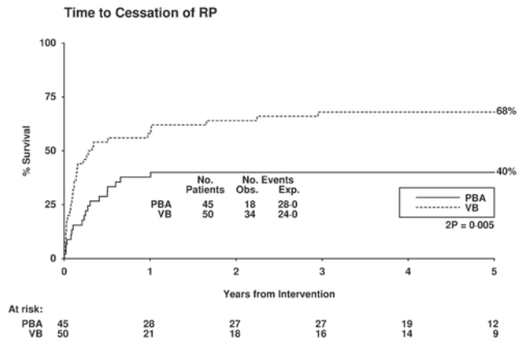

Figure 4. Time to cessation of rest pain

TABLES

	Vein Bypass (n = 56)	Plain Balloon Angioplasty (n = 48)	p-value
Age (years) (mean, SD)	74.0 (11.3)	77.2 (7.3)	0.09
Male sex	41 (73%)	32 (67%)	0.5
Comorbidities			
Chronic kidney disease	19 (34%)	7 (15%)	0.007
Stroke / TIA	12 (21%)	8 (17%)	0.5
Myocardial Infarction	8 (14%)	14 (29%)	0.06
Angina	11 (20%)	10 (21%)	0.9
Dialysis	2 (4%)	0 (-)	0.2
Diabetes (DM)	24 (43%)	23 (48%)	0.6
Insulin dependent DM	10 (42%)	8 (35%)	0.6
Smoking Status			
Current	14 (25%)	5 (11%)	0.1
Ex	29 (52%)	27 (56%)	
Never	13 (23%)	16 (33%)	
Clinical Presentation			
Tissue loss	46 (82%)	41 (85%)	0.7
Medical therapy			
Aspirin	38 (68%)	25 (52%)	0.1
Clopidogrel	4 (7%)	3 (6%)	0.9
Antihypertensive	34 (61%)	38 (79%)	0.04
Statin therapy	22 (39%)	12 (25%)	0.1
Warfarin	4 (7%)	5 (10%)	0.6
Paracetamol	36 (64%)	29 (60%)	0.7
Opiates	31 (55%)	28 (58%)	0.8
NSAIDs	13 (23%)	3 (6%)	0.02
Gabapentin	2 (4%)	1 (2%)	0.7
Amitriptyline	5 (9%)	2 (4%)	0.3
Previous Intervention			
Endovascular	5 (9%)	7 (15%)	0.4
Surgical	1 (2%)	6 (13%)	0.03

Baseline characteristics

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PERIPHERAL

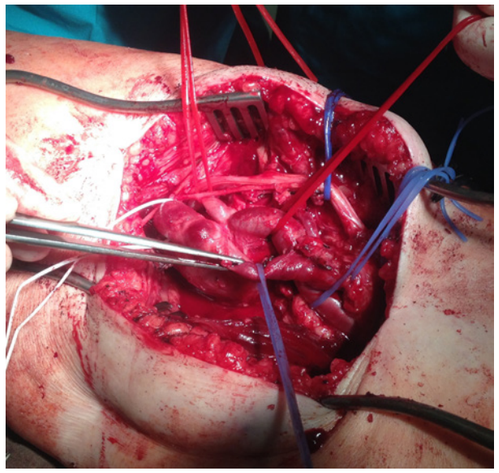
Case report: popliteal artery pseudoaneurism with arterio-venous fistula after total knee replacement

Leonid Magnitskiy, Maxim Kuznetsov

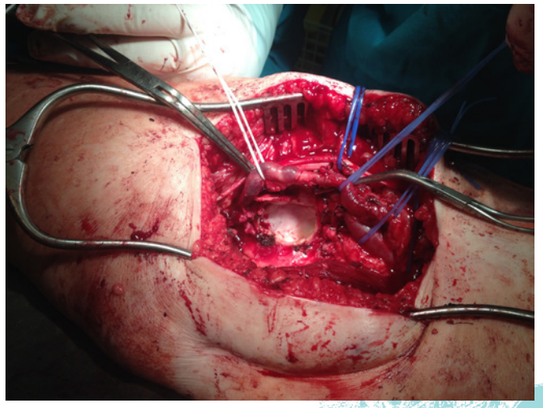
Pirogov Russian National Research Medical University (RNRMU), Department of faculty surgery N°1, Moscow, Russia

Popliteal vascular trauma during total knee arthroplasty is rare, but dangerous and may be limb-threatening. The most common mechanism of arterial injury is direct penetration with saw blade or perforation with a pin. We report on a case of popliteal pseudoaneurism with atrerio-venous fistula presented to us 3 years after total knee arthroplasty with symptoms of chronic arterial and venous insufficiency. Open vascular surgery using posterior approach with resection of the pseudoaneurism, end-to-end anastomosis of popliteal artery and vein was successfully performed. The patient had no further arterial complications.

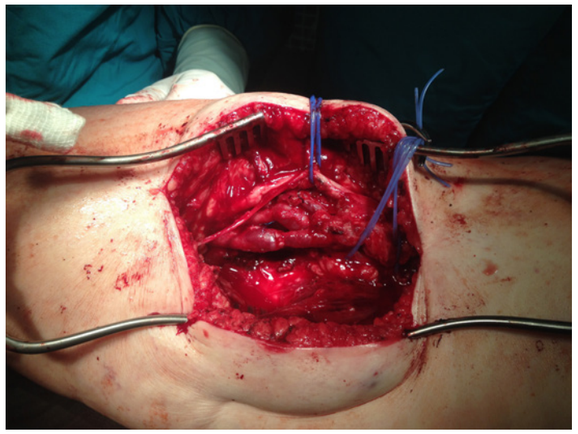
FIGURES



Popliteal artery pseudoaneurism with arterio-venous fistula



After resection



Result

PERIPHERAL

The lower extremities ischemia and diabetic foot. Our experience

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Vascular Clinic, Pristina, Albania

INTRODUCTION

Given that the relatively large number of patients to whom complications are developed to toe due to diabetes, we can concluded that a diabetic foot represents health, as well as social and economic problem. Increasing numbers of patients is becoming even more alarming. The purpose of this paper is to analyze how to deal with diabetic foot in patients with extremities ischaemia in different stage of development, and the importance of vascular reconstruction as the primary surgical treatment of choice.

RESULTS

61 out of 94 patients (64.89%) have been with ischemia and 33 (35.1%) without ischemia.We performed: aortobifemoral by pass, axillofemoral by pass, aortofemoral by pass, femoro-femoral Cross over, femoro-popliteal bypass and femoro-tibialis posterior by pass. In the wound swab is confirmed the presence of infection in all analyzed patients. The most commonly isolated bacteria was Enterococcus, Staphylococcus aureus, MRSA. Also was isolated Proteus mirabilis, mixed aerobic-anaerobic bacterial flora, cytrobacter.Local treatment initially is done with daily toilets of the wound or surgical intervention with aggressive surgical debridement to amputation. Daily toilet is made of 18 cases (19.1%) while with the incision and necrectomy were treated 22 patients (23.4%). Finger amputation of the leg is made in 37 cases (39.36%), while in 11 patients (11.70%) amputation was carried out in the crural region and in 6 patients (6.38%) amputation was carried out in the femoral region.

- 14 cases have been without reconstructing opportunities.

CONCLUSION

Early identification of risk factors, regular and cautious evaluation as well as aggressive treatment in a multidisciplinary team prevents amputation in most cases with complicated diabetic foot.

KEY WORDS

Diabetes mellitus, early prevention, leg amputation

PERIPHERAL

Fusion imaging reduces the need for contralateral or brachial access when using re-entry catheters to cross total aorto-iliac artery occlusions

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INTRODUCTION

Conventionally, when using a re-entry catheter in the aorta in patients with unilateral total iliac occlusions, bilateral femoral artery access is required. In bilateral total iliac occlusion imaging via a brachial approach is required as well. Traditional road mapping is static and does not allow the required rotation of the gantry to orientate the catheter in two planes. Fusion can allow successful re-entry using dynamic imaging via single femoral access in unilateral and femoral access only in bilateral iliac and infrarenal aortic occlusions.

METHODS

A total of 7 patients with either unilateral (5 patients) or bilateral iliac and distal aortic occlusions (2 patients) with between Fontaine IIb (10 - 100 meter) and Fontaine IV stage disease were included. On the workstation a pre-operative fusion mask of the pre-procedural CT angiogram using centre lines and waypoints was created by semi-automatic segmentation through the occlusion. This was uploaded onto a fusion hybrid C- arm system. Within the dedicated hybrid theatre on-table 2 and 3 dimensional registration of the mask using bone and angiographic registration of the access femoral and iliac artery(s) to create an accurate match in two planes using the fusion C- Arm system. After a failed re-entry attempt, fusion was used to orientate a re-entry catheter in the aorta. The intima was punctured close to the occlusion, which was then lined primarily with covered stent grafts dilated to 8 – 10 mm.

RESULTS

Successful re-entry was achieved in 100% of the patient's resulting in all aorto-iliac occlusions successfully re-canalised. There were only two of the cases contralateral access for imaging. No brachial access was required for the bilateral aorto-iliac occlusions. No cases of rupture or distal embolisation were encountered. One limited aortic dissection was treated by iliac kissing stents in a bilateral iliac occlusion.

CONCLUSION

Fusion image guided catheter re-entry into the distal aorta appears to be safe and may reduce the need for bilateral or brachial arterial access to image the aorta. Fusion imaging guided re-entry in this small series of complex aorto-iliac occlusions was 100% successful.

PERIPHERAL

Duplex guided angioplasty for femoro-popliteal arterial occlusive diseases; feasibility and short-term outcomes

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2. Assistant professor of vascular surgery, Beni Suef University.
3. Lecturer of vascular surgery, Kasr Alaini hospital, Cairo University.

INTRODUCTION

Contrast-induced nephropathy (CIN) is a well-known complication of conventional fluoroscopy guided angioplasty procedures and is associated with increased patient morbidity and mortality. In this feasibility study, we tried to perform the angioplasty procedures under duplex guidance alone without the need to give the potentially nephrotoxic contrast agents especially in renal impairment patients and reducing the need for radiation exposure. Objectives: To examine the feasibility of performing peripheral femoro-popliteal endovascular procedures under duplex guidance alone with assessment of initial technical success, procedural complications, and clinical improvement after 3 & 6 months.

PATIENTS AND METHOD

This study included patients with peripheral arterial diseases (PAD); (Rutherford category: 3-6) and laboratory evidence of renal insufficiency presented to our outpatient clinic between (January 2014 to October 2015), who proved by arterial duplex examination to have > 50% stenosis or complete total occlusion (CTO) of the femoro-popliteal arterial segment affecting the middle or lower 1/3 of the superficial femoral artery (SFA) and/or popliteal artery (PA).

RESULTS

21 patients (15 men & 6 women) with serum creatinine levels of ≥ 1.5 mg/dL were selected. Ages ranged from 50 to 72 years (mean: 61 ± 11 years). Disabling claudication was the indication in 11 cases (52%) and critical ischemia in 10 (48%). Isolated popliteal artery lesions were found in 3 cases (14 %) and lesions involving the SFA alone were found in 6 cases (29 %), while significant lesions in both the SFA and PA were found in 12 cases (57%).The average length of the lesions in this study was (mean: 14 ± 4 cm). Immediate technical success was confirmed by completion duplex scan and was documented in all cases. Procedure duration ranged from 45 to 130 minutes (median: 87 minutes). Placement of nitinol self-expandable stents was needed in 13 (62%) cases. The reason for stent placement included: arterial dissection in 9 cases (43%) and plaque recoil in 4 cases (19%). 10 cases needed a single stent while in 3 cases 2 stents were necessary. 11 stents were deployed in the SFA and the remaining 5 stents were in the above knee popliteal segment. For stenotic lesions, the mean peak systolic velocity (PSV) prior to treatment was 340 mm/s and was 120 mm/s after angioplasty with an average reduction of 64%. Mean PSV 2 weeks following duplex guided angioplasty (DGA) were 129 mm/s, showing a reduction of 62%. For all lesions, mean preoperative ABI was 0.64 and improved to 0.83 postoperatively. No distal emboli were detected on completion duplex scans. Three procedural complications were observed in the form of 2 groin hematomas and 1 vessel perforation which was detected by color flow imaging.

CONCLUSION

In patients at risk of developing contrast induced nephropathy, or who have proven allergies to iodinated contrast media, duplex ultrasound guided PTA presents a fairly safe and performable alternative to conventional PTA.

PERIPHERAL

Common Femoral Artery Endarterectomy. Mid Term Outcomes

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BACKGROUND AND AIM

Common femoral artery Endartrectomy (CFE) is the standard treatment for common femoral artery occlusive disease. We aim to assess the medium term outcomes of CFE with or without further concomitant procedures.

METHODS

All patients who underwent either isolated CFE (ICFE), CFE with angioplasty for occlusive arterial disease (CFEA) and concomitant CFE with Endovascular Aortic Aneurysm Repair (CFEE) were included. Patient demographics follow up, clinical improvement; types of CFE closure, patency rates and survival free amputation were noted.

RESULTS

From 2002 to 2015, 1512 patients were referred with a diagnosis of critical limb ischemia (CLI). Of those, 1134 required revascularization. Sixty-six patients underwent CFE. Ten patients underwent an ICFE, 35 had CFEA and 21 underwent CFEE. Demographics were comparable in all groups. Twenty-seven were closed primarily, while 39 required patch closure (12 venous, 8 Dacron, 19 biological). Technical success was 100% in ICFEs, 94% in CFEA and 100% for CFEE (p=0.274). Immediate clinical success was 100% in both CFE and CFEE, but was 85.7% in CFEA (p=0.035). Immediate hemodynamic success was similar in all three groups (P=0.73). Sustained hemodynamic success was 30% in ICFE, 54.3% in CFEA and 23.8% in CFEE (P=0.056).
At 2 years, binary restenosis was 10% in ICFE, 37% in CFEA and 14.3% in CFEE (P=0.039). Primary patency was 90% in ICFE, 74.3% in CFEA and 95% in CFEE (P=0.146). Primary assisted patency was 90% in ICFE, 82.9% in CFEA and 100% in CFEE (P=0.17). Secondary patency was 90% in ICFE, 94.3% in CFEA, and 100% in CFEE (P=0.409).
Re-intervention was required in 26.9% of primary closures, *versus* 12.8% with patch closures (P=0.279). Amputation free survival was 100% in ICFE, 80% in CFEA and 100% in CFEE (P=0.056).

CONCLUSION

CFE is a reliable and dependable procedure, even in the absence of good distal runoff.

PERIPHERAL

Comparative evaluation of patients' and physicians' expectations regarding outcome measurements in peripheral arterial occlusive disease and the patient-physician relationship

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Department of Vascular Surgery, University Hospitals Leuven, Leuven, Belgium

BACKGROUND

There is increasing evidence that alignment of patient and physician expectations improves outcome in general.

OBJECTIVES

To investigate the expectations of patients with peripheral arterial occlusive disease (PAD) and vascular surgeons for a treatment to be successful and to assess the expectations regarding a successful patient-physician relationship.

METHODS

Fifty five patients with PAD, randomly recruited at the department of Vascular Surgery of the University Hospitals Leuven, and 15 Flemish vascular surgeons were asked about their expectations with the help of a self-developed questionnaire.

RESULTS

According to PAD patients and surgeons, the most important outcome parameter for treatment to be successful is experiencing less pain (52% *vs.* 67%), followed by a longer walking distance postoperatively (31% *vs.* 27%).
Both PAD patients (75%) and surgeons (73%) do not expect a change in the amount of medication needed after treatment. However, in contrast with 93% of surgeons, only 46% of PAD patients expect immediate improvement of the complaints after surgery. For patient-physician relationship to be successful, PAD patients (65%) and surgeons (93%) expect the treatment strategy to be decided in consensus.
According to PAD patients and surgeons, being a competent surgeon is the most important quality of a good physician (44% *vs.* 87%), followed by giving clear information (39% *vs.* 13%).
All surgeons stated it was (very) important to have the same expectations as the patients. However, only 27% thought this was actually the case.

CONCLUSIONS

Overall, PAD patients and surgeons seem to have similar expectations although this should not mean that expectations always match in individual patient-physician teams. In contrast to their surgeons, less than half of PAD patients expect an immediate improvement. A survey of the expectations of PAD patients before starting treatment can help to define PAD patients who are open to training exercise.

PERIPHERAL

Patients preferred way of questioning of quality of life: A first exploration in patients with Intermittent Claudication

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BACKGROUND

Patient reported outcome measures (PROMs) and quality of life (QOL) assessment gain importance in patient management. Electronic data collection is an attractive alternative for paper-based surveys. Previous research in patients with head and neck cancer concluded that the use of tablets for questioning QOL was feasible, but patients ≥ 70years old may benefit from more assistance during this process1. Little is known about the preferences of patients with intermittent claudication (IC).

OBJECTIVES

To investigate the preferences of patients with symptoms of IC regarding the method of QOL assessment.

METHODS

All patients were recruited at the Department of Vascular Surgery of the University Hospitals Leuven. During this investigation 56 IC patients were questioned about their QOL using the Walking Impairment Questionnaire (WIQ) and the EuroQOL EQ-5D. During a clinical visit, patients were randomized into 4 different groups. Group 1 filled out the questionnaires on a tablet with assistance. Group 2 filled out the questionnaires on a tablet individually. Group 3 filled out the questionnaires on paper with assistance. Group 4 filled out the questionnaires on papier individually. Afterwards, patients were asked about their personal preferences.

RESULTS

Mean ± SD age was 70 ± 8 years. The vast majority of patients (79%) were men. The majority of patients (71%) preferred to fill out the questionnaires on paper, 16% with the tablet and 13% was neutral. About half of the patients (46%) preferred to answer the questionnaires with assistance, 41% preferred to do this individually, 13% was neutral. Patients <70years old more often preferred a tablet.

CONCLUSIONS

The majority of IC patients preferred to complete the survey on paper and with assistance. Age may be an important factor influencing patients' preferences. This should be taken into account when considering implementation of QOL surveys and PROMs in the care program for IC patients.

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PERIPHERAL

Pharmaco-mechanical thrombolysis in acute DVT: retrospective analysis

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BACKGROUND

The current standard of care in management in acute ileofemoral DVT is shifting towards pharmaco-mechanical thrombolysis in view of increased emphasis on early reduction of clot burden. Here we share our institutional experience of pharmaco-mechanical thrombolysis using simple MPA guiding catheter and recombinant TPA for thrombus maceration and aspiration.

OBJECTIVES

To asses 1 year post thrombotic syndrome and recurrent DVT.

METHODS

33(34 limbs) patients with symptomatic ilio-femoral DVT underwent pharmaco-mechanical thrombolysis (25 male, 9 female; mean age 40 years) using MPA guiding catheter (7F/8F) with R-tpa as thrombolytic agent. IVC filter was placed in 19 patients (57%). Ultrasound guided popliteal vein puncture was done in all patients followed by mechanical thrombolysis and subsequent pharmacological thrombolysis . The mean duration of thrombolyis was 20 hours. The mean follow up was 19 months (12 to 42 months). PTS was assessed using Villalta scoring system.

RESULTS

Complete clot lysis was achieved in 24 (70%) patients. Underlying lesion was noted in 19 (55%) patients out of which 14 were in CIV;13 of them were managed by primary stenting. The average dose of R-tpa used was 44.2mg. There was no major bleeding or procedure relating complications. Four (12%) patients developed mild to moderate PTS and, 1(<3%) patient developed recurrent DVT during follow up. None of them had ulcer or venous claudication.

CONCLUSION

Pharmaco-mechanical thrombolysis using MPA guiding catheter is a safe and effective method for reduction of early clot burden, PTS and recurrent DVT while utilizing minimal lytic agent.

PERIPHERAL

Use of Drugcoated Balloon PTA as first line treatment for all Femoropopliteal lesions

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BACKGROUND

The use of drugcoated balloons (DCB), can potentially reduce the number and length of stenting in the SFA and or popliteal artery. We have treated 116 limbs consecutively with SFA disease (including TASC C and D lesions, restenoses and in-stent restenosis) in a subcohort of patients included in the IN.PACT Global trial to investigate the long-term results (up to 60 months) by use of DCB technology.

METHODS

Between Nov 2012 and Sep 2014, 92 patients with lesions in SFA extending into popliteal area were consecutively enrolled. Selection bias was minimized by enrolling all patients with atherosclerotic femoropopliteal disease presented to our center during this period of which the lesion met the inclusion and exclusion criteria as described in IN.PACT Global. Feasibility endpoint of the trial includes technical success of crossing the lesion and treating the lesion with DEB successfully without any additional stenting. Safety endpoint includes freedom from device-related and procedure-related mortality through 30 days, freedom from major target limb amputation and freedom from TLR within 12 months. The efficacy endpoint is freedom from clinically driven TLR within 12 months and primary patency within 12 months, defined as freedom from >50% restenosis at 12 months as indicated by an independently verified duplex PSVR <2.4 in the target vessel with no reintervention.

RESULTS

Of the 92 patients enrolled, 69.5% were men and the mean age was 69.5 years. 86.8% had intermittent claudication and 13.2% presented with critical limb ischemia. Bilateral limb inclusion resulted in a total of 116 limbs treated and presence of multipel lesions resulted in 134 lesions treated in this subcohort. The overall mean lesion length was 80 mm. The preliminary mean follow-up time, to date, was 36 months on average.
Feasibility endpoint to treat all lesions only with DEB PTA and patent target vessel was 73.2% (98/134). The Safety and Efficacy endpoint as defined in methods was 87.7.3% resp. 91.8% (85.6% at 24m).
Results show a primary patency at 12 months of 88.2% for 86 patients at risk resp. 80% for 79 patients at risk at 24 months. Most patients improved their Rutherford assessment (95%) and their ABI assessment (80%).

CONCLUSION

Treatment of all real-world SFA disease with DEB seems safe and feasible, shows promising primary patency rates and freedom from TLR and appears to have better results as compared to POBA or stenting of the SFA. Full 24-month data and preliminary 36-month data will be presented at the congress.

PERIPHERAL

Endovascular Treatment of Femoropopliteal Arterial Disease. Does cost relate to outcome in a single centre experience?

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AIMS

Endovascular treatment has become the first option in the management of femoropopliteal arterial occlusive disease. Balloon dilatation with plain old balloon angioplasty (POBA) or drug coated balloon (DCB) are used, as well as stenting, atherectomy or a combination of them. The choice of endovascular techniques is mostly based on lesion characteristics and surgeon's preference, which does not always match the favourable cost-effective choice. This analysis aims to relate costs to outcome.

METHODS

A retrospective analysis of the records of all patients treated for femoropopliteal arterial occlusive disease by endovascular means at the University Hospitals Leuven between January 2014 and January 2015 was performed. Demographics, lesion characteristics, intraprocedural details, patency and costs were studied.

RESULTS

Endovascular intervention was performed on 162 limbs, for disabling claudication (IC) in 54.33% of cases and for critical limb ischemia (CLI) in 45.67%. Hemodynamic success, defined as 1-year clinical primary patency rate, was 55.0% for IC and 44.5% for CLI (P=0.147). Clinical primary patency rate stratified by treatment technique was not significantly different between groups (P= 0.989). Also no significant difference in clinical primary patency rate was seen between the high costs group and the low costs group (P=0.589), but high costs interventions treated more severe lesions. At 1 year of follow up the overall limb salvage rate was 93.8% and survival rate was 85.8%.

CONCLUSIONS

This single centre experience shows that real life clinical 1-year patency of the endovascular treatment of femoropopliteal arterial disease is not as good as expected from the results of clinical trials and is achieved at a wide range of cost per procedure. High cost procedures do not result in better clinical 1-year primary patency but they enable to achieve the same patency rates for increasing severity of lesions. The question raises whether these moderate results justify these high expenses.

PERIPHERAL

Clinical Outcomes after Intra-arterial Thrombolysis for Lower Limb Ischaemia – How Successful is it?

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INTRODUCTION

Catheter directed thrombolysis may be used to treat patients who present with acute limb ischaemia. It is often thought to be less invasive but can be associated with significant morbidity and mortality.

METHODS

A retrospective analysis of all patients in our centre who underwent intra-arterial thrombolysis for lower limb ischaemia, over a 4 year period was performed. Tissue plasminogen activator (tPA) was used with a continuous heparin infusion and patients were monitored on the high dependency unit (HDU). Serial angiograms were performed to assess progress.

RESULTS

24 thrombolysis episodes were performed in 21 patients. Median age was 66 years and 85% were male. The aetiology of ischaemia was prosthetic graft occlusion in 33%, acute arterial thrombosis in 33%, vein graft occlusion in 21%, occluded stent in 8% and embolus in 4%. Concomitant angioplasty was performed in 62% cases and stents placed in 8%. 75% patients required 2 or more follow-up angiograms and technical success on the completion angiogram was seen in 50% patients. 33% patients required surgical intervention (see Table 1). Within 30 days of thrombolysis,13% underwent major amputation and death from intracranial bleeding occurred in 4%.

CONCLUSION

Thrombolysis can produce successful results but patients should be carefully selected. It is both costly and time consuming and many patients need further surgical revascularization. With the introduction of new thrombo-aspiration devices, it may become more effective with reduced HDU stay and lower costs.

TABLE I

Patients requiring surgical intervention after thrombolysis

Operation	Percentage patients (%)
Lower limb bypass	17
Open thrombectomy, patch closure & refashionioning distal anastomosis	8
Fasciotomies post thrombolysis	4
Repair pseudoaneurysm & embolectomy	4

Patients required an average of 2.8 days on HDU, which costs in excess of £1100/day 1.

REFERENCE

1. www.parliament.uk, Department of health, July 2014

PERIPHERAL

Ferumoxytol-enhanced Magnetic Resonance Angiography (FeMRA) - optimal dosing and feasibility

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BACKGROUND

Traditional contrast media are problematic in advanced chronic kidney disease. Ultrasmall superparamagnetic particles of iron oxide (ferumoxytol) are safe in chronic kidney disease and have been used for imaging in other settings. They also hold promise for angiography. We tested the feasibility of ferumoxytol enhanced magnetic resonance angiography (FeMRA) in patients with renal failure and performed a dose finding study.

METHODS AND RESULTS

31 patients with advanced renal failure and a clinical indication for imaging were offered 3T FeMRA. 26 patients had peripheral arterial imaging and were included in the analysis. The remaining 5 had dialysis fistulae imaged. Patients received 4 mg/Kg of Ferumoxytol in divided aliquots and aorto-iliac 3D-FLASH was performed pre-contrast and after every aliquot of Ferumoxytol. Regions of interest (ROI) were placed in the aortic lumen in pre- and post-contrast sequences. Mean ROI signal was recorded and plotted against Ferumoxytol dose. Regression analysis was performed. Qualitative imaging assessment was performed.

Successful imaging was performed in all patients. A parabolic relationship between signal and dose was observed. This predicted peak signal, with signal drop above 3.90 mg/Kg in the aorta. At 2.5 mg/Kg, imaging quality was diagnostic by qualitative assessment. There were no adverse events.

CONCLUSION

FeMRA holds potential in patients with advanced renal failure. We have demonstrated that although peak signal was obtained at a dose of 3.90 mg/Kg, there was little added signal at doses above 2.5 mg/Kg.

PERIPHERAL

Endovascular-first strategy for management of peripheral arterial aneurysms in Behcet's Disease: A contemporary case series

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INTRODUCTION

Behcet's disease (BD) is a multi-system disease,with vascular complications ranging from (7-29%) of patients, commonly in the form of peripheral aneurysms which are prone for rupture. Surgical repair has disappointing results, with high recurrence .Endovascular stent grafting is advised by many authors, however, pseudo aneurysms can develop at the landing zones and at the puncture sites for access

PATIENTS AND METHODS

A retrospective analysis was carried out for prospectively collected data of all cases presented with peripheral arterial aneurysms associated with BD and received surgical intervention between January, 2012 and January, 2016. An endovascular first approach was always sought. Open surgical repair (OSR) was performed in case of failure or non-feasibility of endovascular repair (EVR).

RESULTS

Between January 2012 and January 2016, 14 cases, with 15 peripheral arterial aneurysms were identified. Age ranged from 23 to 48 (Mean 32.2) years. 10 cases (11 aneurysms, 73%) were managed electively, while the other 4 (27%)presented to emergency department with ruptures (P=0.023). Two of the ruptures were associated with limb ischemia, and 3 of the elective cases were associated with deep venous thrombosis (DVT).

Endovascular approach was attempted in 13 aneurysms (12 cases, 87%), with 1ry technical success in 9 (69%), and assisted 1ry success in 1 case (8%), and failed in 3 (23%).

Open repair was the first approach in 2 cases (13%), presenting with rupture.

Mean follow up was 34 months (7-48 months). During follow up period, 3 stents occluded .

Open repair with 1ry anastomosis or vein graft with added PTFE wrapping was carried out in 6 situations; 2 as primary interventions on emergency basis, 3 for failed EVR, and one for a pseudo-aneurysm at the access site.

CONCLUSION

Endovascular approach as a first option for treatment of peripheral arterial aneurysms with Behcet's Disease, is a feasible and safe strategy that can allow for less invasive interventions for such challenging cases.

VEIN

Endovenous laser ablation (EVLA) of symptomatic varicose veins using 1470 nm wavelength diode laser

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PURPOSE

Our experience of Endovenous laser ablation (EVLA) of symptomatic varicose veins using 1470 nm wavelength diode laser in a hospital in India

Methods and Materials

In a prospective, non-randomized, consecutively enrolled single center trial, 505 limbs in 403 consecutive patients were treated by EVLA using 1470 nm wavelength diode laser between August 2010-January 2016. All patients underwent a detailed pre-procedure doppler ultrasound. A total of 451 great saphenous veins (GSV) and 54 short saphenous veins (SSV) were treated by EVLA under ultrasound (US) guidance after injecting perivenous tumescent anesthesia . Patients were followed up for clinical improvement and for doppler study upto 1 year.

RESULTS

The procedure was technically successful in 95% .The causes of failure were GSV stenosis due to prior thrombophlebitis (8), tortuous GSV (13), GSV perforation (1) and presence of CFV thrombus (5). No mortality or major adverse events (DVT, PE or nerve injury) were noted. At the end of 1-year follow-ups, overall rate of successful venous occlusion was 98.2% . Clinical improvement was seen in >96% patients with improved symptom status and venous disability score at 1 year. A 2- year follow-up in fifty six patients showed compete occlusion of ablated veins.

CONCLUSION

These results re-emphasize the safety and efficacy of EVLA using 1470 nm wavelength diode laser in a tertiary health care center in India for the treatment of varicose veins. Tortuous GSV and previous thrombophlebitis have emerged as major factors adversely affecting the EVLA outcome in our patients.

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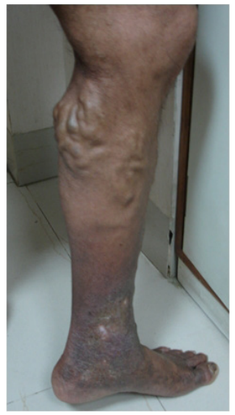
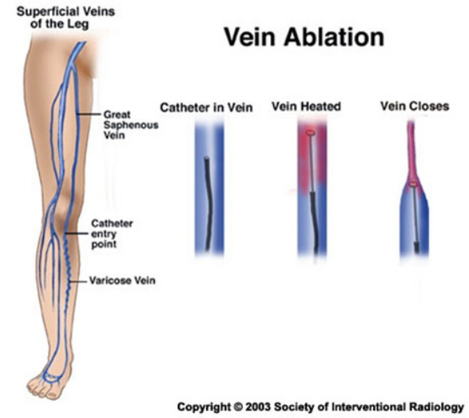
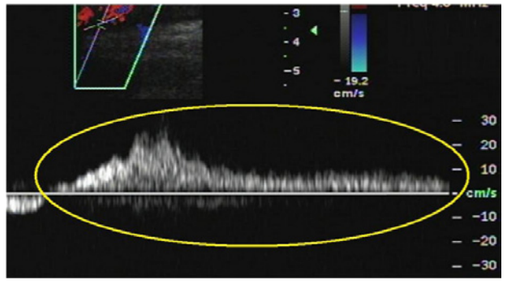
FIGURES



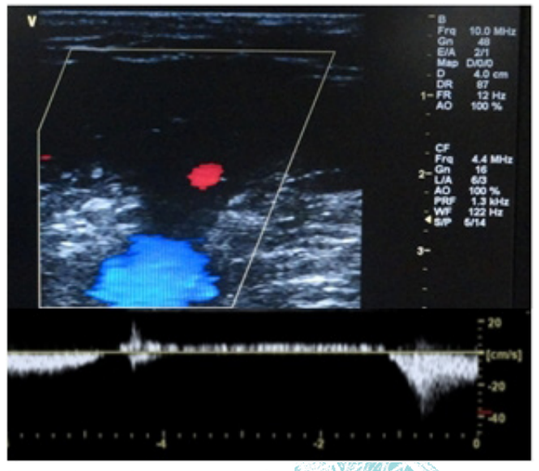
Varicose veins Tortuous dilated Varicose veins with skin ablation



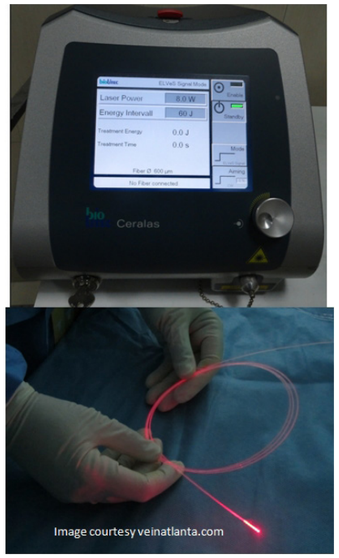
Laser venous ablation Schematic representation of Laser venous



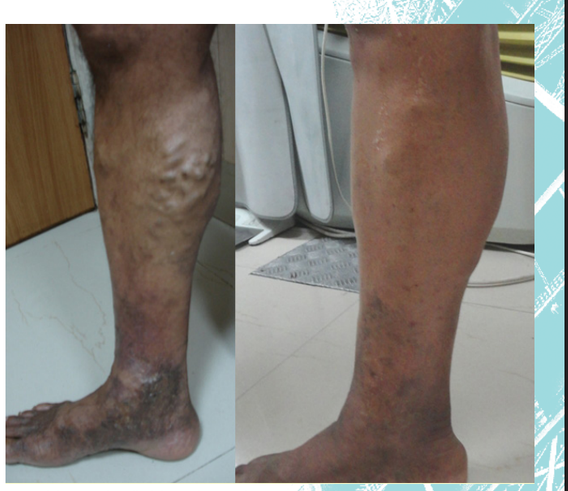
Pre procedure doppler image
Presence of saphenofemoral reflux on valsalva



Doppler image On valsalva, significant reversal of flow seen at junction into dilated GSV



Laser machine and fiber The fiber emanates red light when energised



Pre ablation leg(left) and Post laser ablation- At 3 months(right) There is reduction in the varicosities and markedly less skin pigmentation at followup

VEIN

Comparison of 1470 nm Laser and Radial 2ring Fiber with 1470 nm Laser and Radial Fiber in Endovenous Laser Ablation of Saphenous Varicose Veins

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OBJECTIVE

The aim of this study is to compare the clinical efficacy and safety of two laser fiber types in endovenous laser ablation (EVLA) of saphenous varicose veins of the lower limb.

PATIENTS AND METHODS

From January 2013 to September 2015, 94 patients (94 limbs) with primary varicose veins were randomized into two groups. They were treated with radial fiber and 1470 nm laser in Group 1 (46 limbs) and radial 2ring radial fiber and 1470 nm laser in Group 2 (48 limbs) in order to ablate the saphenous vein. Vein occlusion rates at 1, 6 weeks and 6 and 12 months and pain in treated region were recorded as primary end¬point. Venous clinical severity scores (VCSS) for assessment of quality-of-life outcomes following endovenous laser ablation with both fiber types were recorded as secondary endpoint.

RESULTS

Occlusion rates at 1 and 6 weeks were 100% in both groups, at 6 months and 12 months were 100% in Group 1, and 97.9% in Group 2. Rates of pain (3% *vs.* 14.8 %) were lower in Group 2, but not significantly. VCSS scores were significantly better in Group 2 at 1 week ($P < 0.001$). At 6 weeks, 6 and 12 months, no significant differences between the groups were evident.

CONCLUSION

Endovenous treatment of saphenous vein reflux with either fiber types results in clinical improvement of symptoms and comparable occlusion rates. In the early postoperative period,2-ring laser fiber seems to remove quality-of-life limitations associated with conventional radial fiber.

KEYWORDS
varicose vein, 1470 nm laser, radial 2ring fiber, endovenous laser ablation, VCSS

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VEIN

Endovascular stenting in a superior vena cava syndrome

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INTRODUCTION

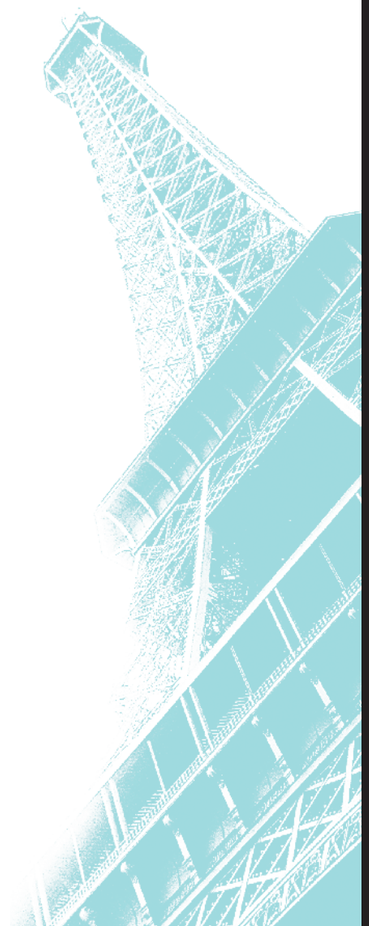
Superior vena cava syndrome(SVCS),described by William Hunter in 1757, is a clinical entity including symptoms due to an obstruction of return flow in the superior Vena cave. In 60-90% of case, it is caused by invasion or extrinsic compression by malignancies. Actually, there is a recent rise of benign etiologies due to the increasing use of intravascular devices such as central venous cathethers and pacemakers. Thrombi asssociated with these devices may account for up to 28% of cases of SVCS.

CASE REPORT

We report the case of a 64- year- old woman admetted with the diagnosis of SVCS related to an indweling port catheter with a total occlusion of the superior cava extended to the left innominate vein .We opted for an endovascular treatment: transluminal angioplasty via the left jugular vein followed by stenting (self-expanding stent). The final SVC cavogram confirmed the patency of the stent. The procedure was effective with an immediate post operative symptoms relief. At 9 months follow up she is well and developped no complications.
Through this rare severe complication of port cathter (only few cases are reported in the litterature), we can discuss the other more common causes of SVCS, specially malignant diseases and the place of endovascular treatment.

CONCLUSION

The endovascular treatment of SCVS is safe effective and durable and should be the first line therapeutic option.



VEIN

Venous aneurysms: the hidden danger. A case series and review of literature

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INTRODUCTION

Venous aneurysms (VA) are often underestimated as a dangerous vascular condition than can lead to fatal complications.

PATIENTS AND METHODS

A retrospective analysis of cases presented with VA Between January 2011, and January 2016.

RESULTS

We identified 13 VAs in 13 patients. Mean age was 21.6 years (Range 7-42). 6 cases were males (46.2%), and 7 were females (53.8%). All patients presented with swellings in different areas, mostly in the neck (9 cases, (69.2%). 2 cases had SSV aneurysm complicated with l paresthesia (15.3%). All cases underwent surgical correction. Tangential excision was done for non-complicated saccular aneurysms (6 cases, 46.2%), while ligation and excision was done for fusiform cases (5 cases) and 2 saccular aneurysms presenting with thrombosis (53.8%). No signification complications were noticed.

CONCLUSION

We believe that VAs should be promptly treated surgically to avoid possible fatal Pulmonary embolism.

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