

## CONTENTS



### abstracts

Scientific Programme - information	3
Scientific Programme - an overview	5 - 18
Presentations:	
Session 1	21 - 26
Session 2	29 - 32
Session 3	35 - 40
Session 4	43 - 48
Session 5	51 - 58
Session 6	61 - 65
Session 7	67 - 71
Session 8	73 - 78
Session 9	81 - 86
Session 10	89 - 94
Poster Session	97 - 110
Nurses & Technicians' Session	113 - 121
EVST Complex Case Session	123 - 135
ESVS Prize Winners	136 - 139

## THE SCIENTIFIC PROGRAMME

### ESVS Prizes

The prizes, provided by Elsevier Science, will be awarded to the authors and presenters of the "top two" papers, as judged by the Selection Committee, with a first and second prize. The best poster will also be awarded with a prize kindly provided by Elsevier.

Please send all manuscripts electronically to : [www.ejves.com](http://www.ejves.com) click **SUBMIT MANUSCRIPT**

If you wish your paper to be considered for a prize by the Selection Committee you must :

- Be under 41 years of age on the 9 September
- Present original work
- Be the principal author and presenter
- Provide the Selection Committee with a preliminary manuscript by 9 September. Failure to do this will result in a paper not being considered for a prize.

Once a paper has been selected for presentation at the ESVS meeting, the work becomes the property of the ESVS. All accepted and reserve abstracts are published in the Abstract Book and electronically on EJVES Extra.

All abstracts and reserves are accepted on the understanding that a manuscript will be submitted for consideration for publication in the European Journal of Vascular and Endovascular Surgery.

Authors must submit their manuscript to the Journal via Editorial Manager ([www.editorialmanager.com/ejves](http://www.editorialmanager.com/ejves)) by 9 September.

Failure to submit a manuscript in time will mean that the abstract cannot be presented at the Meeting.

Authors will have an opportunity to state if they do not wish to have their work published in the EJVES, but they must give a valid reason as to why not and the ESVS Selection Committee will have the final say as to whether the paper is accepted for presentation.

All abstracts and manuscripts must be the original work of the author and there must be no duplication of material written by others. This should be confirmed in writing. Failure to comply will result in disqualification of the paper. The ESVS takes no responsibility for the personal views expressed by authors.

## SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

### Session 1

23 September

0830 - 1000

Hall 1

Chair: V Rimbau, C Liapis

The Impact of Decreasing Aneurysm Prevalence on a Local Screening Programme.

*R Darwood* 1

The Incidence of Abdominal Aortic Aneurysms is Declining.

*JT Powell* 2

**Invited commentary on papers 1 and 2: G Hamilton, UK**

Long-term Results of Iliac Aneurysm Repair with Iliac Branched Endograft.  
A 5 Year Experience on 100 Consecutive Cases.

*G Parlani* 3

Short Stay EVAR (SEVAR) – Selection Criteria and Outcome.

*N Al-Zuhir* 4

Cost-Effectiveness of Open versus Endovascular Repair of Abdominal Aortic Aneurysm:  
Results of a Multicenter Randomized Trial.

*FA Lederle* 5

Health Related Quality of Life Following Open and Endovascular Repair: Long-Term  
Results of a Randomised Trial.

*JL de Bruin* 6

*Notes*

---

---

---

---

---

---

---

---

---

---

SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

Session 2

23 September

1000 - 1100

Hall 1

Chair: P Stierli, D Kostic

- 7 Imaging of the Vulnerable Carotid Plaque: Biological Targeting of Inflammation using Ultrasmall Superparamagnetic Particles of Iron Oxide (USPIO) and MRI. *J Chan*
- 8 Does Morphology of Carotid Plaque Depend on Patient's Redox Status? *A Migdalski*
- 9 Association Between Plaque Echogenicity and Embolic Material Captured in Filter During Protected Carotid Angioplasty And Stenting. *TG Giannakopoulos*
- 10 The Effect of Novel Texture Features of Homogeneity and Echolucency on Carotid Plaque Characterization; Results from the Asymptomatic Internal Carotid Artery Stenosis and Risk of Stroke (ACSRS) study. *GC Makris*

Notes

---

---

---

---

---

---

---

---

---

---

SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

Session 3

23 September

1130 - 1300

Hall 1

Chair: G Hamilton, S Haulon

- Endovascular Treatment of Aortic Arch Aneurysms with Transfemoral Multibranched Stent-grafts: Initial Experience. *C Lioupis* 11
- Analysis of Stroke after TEVAR Involving the Aortic Arch *Y Tshomba* 12
- Pathology Specific Neurological Outcome Following Thoracic Endovascular Aneurysm Repair (TEVAR): Is There A Difference Between Aneurysm And Dissection? *R Clough* 13
- A Prospective Population-Based Study of the Incidence and Outcome of Acute Aortic Dissection: Implications for Pre-Morbid Risk Factor Control and Limitations of IRAD. *DPJ Howard* 14
- Changes in Arterial Stiffness and Serum Osteoprotegerin in Patients Undergoing Endovascular Repair of Abdominal Aortic Aneurysms. *K Moulakakis* 15
- Identifying Patients at Risk of Renal Failure Following Open Elective AAA Repair *S Grant* 16

Notes

---

---

---

---

---

---

---

---

---

---



## SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

### Session 6

24 September

0830 - 1000

Hall 1

Chair: R Naylor, H Sillesen

- 31 Patients With Recurrent Ischaemic Event From Carotid Artery Disease Have A Large Lipid Core And Low GSM. *M Salem*
- 32 Early Carotid Endarterectomy (CEA) is Associated with a Higher Adverse Event Rate. Data from Symptomatic Patients Participating in the GALA Trial. *D Dellagrammaticas*
- 33 Perioperative Outcome of Carotid Endoarterectomy According with Type and Timing of Neurological Symptoms. *G Faggioli*
- 34 Alterations of Baroreflex Sensitivity After Carotid Endarterectomy According to the Preoperative Carotid Plaque Echogenicity. *N Tsekouras*
- 35 Misinterpretation of the CREST Trial and Its Misleading Impact on the US AHA Guidelines. *F Veith*

Notes

---

---

---

---

---

---

---

---

---

---

## SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

### Session 7

24 September

1000 - 1100

Hall 1

Chair: H van Bockel , P Vela

- Chlamydia Pneumoniae (Cp) Serology but not Aneurysm Wall Infection is Associated With the Enlargement Rate of Small Abdominal Aortic Aneurysms (SAAA). *E Kaperonis* 36
- Endovascular Repair of Abdominal Aortic Aneurysms (AAA) with Adverse Necks: Use of Standard Infra-Renal Devices (EVAR) Outside of the Manufacturers' Instructions for Use (IFU) is not a Safe Option. *J Cross* 37
- AAA with a Challenging Neck: Early Outcomes Using the Endurant Stent-graft System. *F Setacci* 38
- Early and Late Arterial Blood Pressur Response in Severely Hypertensive Children Undergoing Reconstructive Surgery for Middle Aortic Syndrome (MAS) and/or Renal and Visceral Artery Stenosis (RAST) in Relation to Age and Type of the Lesion. *P Düppers* 39

Notes

---

---

---

---

---

---

---

---

---

---

**Session 8**

**24 September**

**1130 - 1300**

**Hall 1**

Chair: J Powell, U Demircilik

- 40 Prognostic Value of CD4+CD28- T-Cell Prevalence and Low-dose Aspirin for the Progression of Abdominal Aortic Aneurysms. *A Frech*
- 41 Arterial Stiffness is Associated with the Severity of Atherosclerosis and Serum Osteopontin Levels in Patients with Symptomatic Peripheral Arterial Disease. *J Kals*
- 42 The Beneficial Effects of a Direct Thrombin Inhibitor, Dabigatran, on the Development and Stability of Atherosclerotic Lesions in Apolipoprotein E-Deficient Mice. *N Kadoglou*
- 43 Correlations between Clinical Variables and Gene Expression Profiles in Carotid Plaque Instability. *A Razuvaev*
- 44 Correlation of Biomechanics and Inflammatory Tissue Reaction in Abdominal Aortic Aneurysm (AAA) Assessed by Computational Finite Element Analysis and FDG-PET-CT. *C Reeps*
- 45 Hemodynamic Changes during Transseptal Access to the Ascending Aorta in a Porcine Model. *S Wipper*

*Notes*

---

---

---

---

---

---

---

---

---

---

**Session 9**

**24 September**

**1530 - 1700**

**Hall 1**

Chair: F Vermassen, G Biro

- Aortic Aneurysm Repair Using an Endoprosthesis Designed to Eliminate Endoleaks: Single Center Experience in Latvia. **46**  
*D Krievins*
- Use of Chimney Grafts for Endovascular Repair of Juxtarenal Aortic Aneurysms is Still Safe after 24 Months' Follow Up. **47**  
*K Donas*
- Laparoscopic Versus Open Approach for Aortobifemoral Bypass for Severe Aorto-iliac Occlusive Disease. **48**  
*J Tiek*
- Total Laparoscopic versus Conventional Abdominal Aortic Repair for Occlusive and Aneurysmal Disease. A Risky Innovation. **49**  
*J B Ricco*

**Invited commentary on papers 48 and 49: P Cao**

- No Differences in Peri-operative Outcome between Symptomatic and A-symptomatic AAA's after EVAR: An Analysis from the ENGAGE Registry. **50**  
*R Stokmans*
- Determinants of AAA Sac Shrinkage after EVAR - Results from the ENGAGE Registry. **51**  
*D Boeckler*

*Notes*

---

---

---

---

---

---

---

---

---

---

## SCIENTIFIC SESSIONS • ORAL PRESENTATIONS

### Session 10

25 September

0830 - 1000

Hall 1

Chair: C Setacci, A Stella

- 52 Cost and Effectiveness of Laser with Phlebectomies Versus Foam Sclerotherapy in Superficial Venous Insufficiency. Early Results of a Randomised Controlled Trial. *C Lattimer*
- 53 Identification of Distinctive Metabolic Signature of Varicose Veins by Nuclear Magnetic Resonance Spectroscopy - A Novel Research Area for Understanding the Pathogenesis of Varicose Veins Disease. *MA Anwar*
- 54 Superficial Vein Thrombosis in Patients with Varicose Veins: Role of Thrombophilia Factors, Age and Body Mass. *C Karathanos*
- 55 STD Foam is Less Stable but more Active than Polidocanol. *B McAree*
- 56 Risk Factors for Non-Recanalization after Anticoagulation Therapy in Patients with Isolated Calf Vein Thrombosis. *YJ Park*
- 57 Generic Health-Related Quality of Life is Significantly Worse in Varicose Vein Patients with Lower Limb Symptoms Independent of CEAP Clinical Grade. *K Darvall*

Notes

---

---

---

---

---

---

---

---

---

---

## SCIENTIFIC SESSIONS • POSTERS

### Poster Case Presentation Session

24 September

1730 - 1830

Hall 1 Foyer

Chair: G Fraedrich, C Setacci

Posters will be displayed throughout the meeting in the Foyer of Hall 1, but the session with presenters will take place as above.

- Endovascular Repair of Tandem Carotid Stenoses. *H Loubiere* 1
- Emergent Hybrid Procedure to Treat Complicated Stanford Type III-B Acute Dissection. *F Gallardo Pedrajas* 2
- Delayed Presentation of a Thoracic Aortic Injury by a Vertebral Pedicle Screw. *E Gallitto* 3
- Aortoenteric Fistula and Type III Endoleak as Late Complication of EVAR. *E Martinez* 4
- Disruptive Endovascular Technology with Multilayer Stents as a Therapeutic Option in the Management of a Thoracoabdominal Aortic Aneurysm. *N Hamada* 5
- Uncommon Type of Extraanatomic Redo Renal Artery Grafting for Takayasu's Arteritis Lesion. *V Kulbak* 6
- Lower Limb Ischemia due to Occlusion of a Persistent Sciatic Artery Aneurysm. *J Tiago* 7

continued ....

Notes

---

---

---

---

---

---

---

---

---

---

**Poster Case Presentation Session**

**24 September**                      **1730 - 1830**                      **Hall 1 Foyer**

**Chair: G Fraedrich, C Setacci**

continued ....

- 8** Ruptured Superficial Femoral Artery Aneurysm Simulated a Mesenchymal Tumor. *Z Bujas*
- 9** Aorto-Oesophageal Fistula. An Unusual Case of Mediastinal Air. *M Kay*
- 10** Energy Drink Induced Acute Limb Ischaemia. *A Miller*
- 11** EVAR of the Aortic Arch with Transapical Placement of Side Branches. *M Altreuther*
- 12** Vein Patch Reconstruction in Infrarenal Aorta Rupture due to Bacterial Aortitis. *M Maszkowski*
- 13** About Three Cases of Internal Carotid Artery Aneurysms Operated on as Emergency. *RF Popa*
- 14** The Management of a Case of Phlegmasia Cerulea Dolens with Intravenous Catheter Delivered Thrombolysis. *P Patel*

*Notes*

---

---

---

---

---

---

---

---

---

---

**FRIDAY 23 September**                      **16300 - 1800**                      **Hall 3**

Chair: B Sol-de Rijk

- Duplex Immediately After EVAR Deployment. *C Rogan 1*
- How to Diminish Major Amputations in Diabetic Patients, the "Toe and Flow" Concept Approach. *S Osma 2*
- A Prospective Analysis of Vacuum Assisted Closure Therapy for Surgical Site Infections in Vascular Surgery. *A Stachman 3*
- Co-ordinating Endovascular Aneurysm Repair: the Role of the Vascular Nurse Practitioner. *C Thomson 4*
- A Distressed Personality in Patients with Intermittent Claudication. *HCW van Dalen 5*
- Nursing Approach to Transjugular Intrahepatic Portosystemic Shunt (TIPS). *T Theodoropoulos 6*
- A Feasibility Study for the use of Surgical Endoluminal Radiofrequency Ablation for Recurrent Varicose Veins. *A Sinclair 7*
- Stroke and Transient Ischaemic Attack Awareness. *S Sandison 8*
- The Clinical Pathway of a Patient with PAD. *A Sieben 9*

*Notes*

---

---

---

---

---

---

---

---

---

---





### The Incidence of Abdominal Aortic Aneurysms is Declining.

Anjum A, Powell JT

Imperial College, London, United Kingdom

**Introduction**  
**Aim of the study** Between 1951 and 1995 there was a steady increase in age-adjusted deaths from abdominal aortic aneurysm (AAA), from 3 to 67 per 100,000 population in our country, supporting an increase in incidence of AAA. More recently, evidence from elsewhere suggests that now the incidence of AAA may be declining.

**Materials/**  
**Methods** We obtained national statistics for hospital admissions for and deaths from AAA and after population age adjustment used these data to investigate current trends in our country.

**Results** Between 1995 and 2010 there has been a reduction in age-adjusted mortality from abdominal aortic aneurysm from 67 to 36 per 100,000 population. The majority of these deaths are from ruptured AAA. This decrease in deaths is most marked in men but also evident in women. During this same time period the elective hospital admissions for AAA repair, per 100,000 population, in men (women) were 57(11) in 1995, 71(15) in 2000 and 73(13) in 2009. At the same time admissions for ruptured AAA per 100,000 population in men (women) have decreased from 29(7) in 1995, to 29(8) in 2000 to 22(6) in 2009. Hence, deaths from AAA are declining without a compensatory increase in elective aneurysm repairs.

**Conclusions** These data, which are supported by a declining yield of AAA from population screening, suggest that the incidence of AAA in our country is declining rapidly. The reasons for this are unclear but public health measures resulting in a decreasing exposure to tobacco products and improved control of blood pressure may be contributory.

### Long-term Results of Iliac Aneurysm Repair with Iliac Branched Endograft. A 5 Year Experience on 100 Consecutive Cases.

1 G Parlani, 1 Verzini F, 1 De Rango P, 1 Brambilla D, 2 Coscarella C, 2 Ferrer C, 2 Cao P

1Vascular and Endovascular Surgery, Azienda Ospedaiera di Perugia, University of Perugia, 2 Operative Unit of Cardiovascular Surgery S Camillo-Forlanini Hospital Roma, Italy

**Introduction**  
**Aim of the study** Iliac branch endograft device (IBD) has been recently introduced as an appealing and effective solution to avoid the wide range of complications occurring during repair of aortoiliac aneurysm with extensive iliac involvement. Nevertheless, the performance of IBD over time is unknown. Aim of this study was to analyze safety and long term efficacy of IBD in a consecutive series of patients.

**Materials/**  
**Methods** Between 2006 and 2011, 100 consecutive patients were enrolled in a prospective database on IBD. Indications included unilateral or bilateral common iliac artery aneurysms combined or not with abdominal aneurysms. Patients were routinely followed with Computed Tomography.

**Results** There were 94 males, mean age 73.2. Preoperative mean common iliac aneurysm diameter was 41.23 mm (range 27-76). Sixty-five patients had AAA > 35 mm associated with iliac aneurysm (range 35-88 mm). Thirteen patients presented an hypogastric aneurysm. Twelve patients underwent isolated iliac repair with IBD and 88 patients underwent IBD associated with endovascular aortic repair. Periprocedural technical success rate was 97%, with no mortality. Two patient experienced external iliac occlusion in the first month. At a mean follow-up of 20.2 months (range 1-60) Iliac aneurysm growth > 3 mm was detected in 4 patients (4%). Iliac endoleak was present in 1 patient and buttock claudication 2 patients. KM estimated patency of internal branch is 95% at 1 year, 93% at 3 years, 93% at 5 years. KM estimate freedom from any reintervention is 94% at 1 year and 88% at 3 year. No late ruptures or aneurysm related deaths occurred.

**Conclusions** Long term results of IBD for iliac aneurysms ensure persistent iliac aneurysm exclusion at 5 years, with low risk of reintervention. This technique should considered as a first option in patients with extensive iliac aneurysm disease with favourable anatomy.

### Short Stay EVAR (SEVAR) – Selection Criteria and Outcome.

Al Zuhir N, Tang, TY, Wu M, Curran G, Varty K, Boyle J, Hayes P

Cambridge Vascular Unit, Cambridge University Hospitals NHS Trust, Cambridge, United Kingdom

<b>Introduction Aim of the study</b>	Endovascular aneurysm repair (EVAR) is a well established and less invasive procedure for abdominal aortic aneurysm (AAA) repair. Although AAA patients usually have significant co-morbidities, EVAR still offers the potential for a reduced hospital length of stay (LOS). The aim of this study was to identify patients suitable for short stay EVAR (SEVAR) with a one night hospital stay and document their outcome.
<b>Materials/ Methods</b>	Patients for EVAR were assessed prospectively for SEVAR over an 18-month period using Day Surgery guidelines. Joint anaesthetic and surgical approval was necessary for these patients to be included in this vascular pathway. These patients were admitted on the day of surgery to the vascular ward with a designated care protocol for discharge the day after.
<b>Results</b>	91 patients were selected on an intention to treat basis. There were 85 (93%) males and the mean age was 76 (SD= ±7.1). The mean AAA maximal diameter was 6.0 cm (SD=±1.0). 27 (29%) patients met the criteria for SEVAR, 21 patients (78%) were successfully discharged one day post operatively. 6 patients (22%) failed SEVAR: 1 with only an extra day due to unforeseen transport problems, 1 patients had urinary retention with haematuria and stayed for 7 days, 2 were due to being elderly and living alone and 2 patients had unexpected difficulty with graft implantation, their LOS was also an extra day. 64 patients were not selected for SEVAR because of different issues: 26 (40%) had a history of unstable ischaemic heart disease (IHD), chronic obstructive pulmonary disease (COPD) or chronic kidney disease (CRD) requiring rehydration peri-operatively, 11 (17%) patients required pre-operative internal iliac embolization, 7 (11%) patients had transport issues, 8 (13%) patients were not assessed by the vascular nurse practitioner and 12 (19%) were deemed as a technically difficult EVAR. Total SEVAR mean LOS was 1.5 days versus 4.7 days for the patients were not selected (P=0.04).
<b>Conclusions</b>	SEVAR is a safe and cost effective option for selected patients reducing hospital LOS by at least 3 days. Our experience suggests this can be extended to more patients with modified, less restrictive, day of surgery selection criteria, while arranging appropriate discharge planning prior to admission.

### Cost-Effectiveness of Open versus Endovascular Repair of Abdominal Aortic Aneurysm: Results of a Multicenter Randomized Trial.

Lederle FA

Minneapolis VA Medical Center, Minnesota, USA

<b>Introduction Aim of the study</b>	Although endovascular repair of AAA has reduced peri-operative mortality, later outcomes have not been improved compared with open repair. This increases the need for accurate comparison of costs, particularly given the high cost of endovascular grafts. We compared costs and cost-effectiveness of the two procedures in the Open Versus Endovascular Repair (OVER) Veterans Affairs Cooperative Study.
<b>Materials/ Methods</b>	Clinical outcomes to 2 years have been reported previously on the 881 randomized patients. Quality adjusted life years (QALYs) were calculated using utility scores incorporating western population preferences derived from EQ-5D questionnaires collected at baseline and annually. Health care utilization data were obtained directly from patients and from national VA and Medicare data sources. Detailed costs for the hospitalization for AAA repair, costs for all graft components, and costs of other health care provided by VA were obtained from the national VA sources using methods previously developed by the VA Health Economics Resource Center. Costs for non-VA care were determined from Medicare claims data or billing data from the patient's healthcare providers.
<b>Results</b>	After 2 years of follow-up, survival was 1.78 life years in the endovascular repair group and 1.74 life years in the open repair group (p=0.29). Mean QALYs were 1.44 in the endovascular group and 1.45 in the open group (p=0.78). Mean graft costs were \$14,180 in the endovascular group and \$1,343 in the open group, a difference offset by higher costs in the open group related to greater length of stay. The resulting costs for the hospital admission for AAA repair were \$38,365 in the endovascular group and \$45,559 in the open group (p=0.12), and total 2-year healthcare costs were \$75,362 in the endovascular group and \$82,221 in the open group (p=0.29).
<b>Conclusions</b>	In this multicenter randomized trial, survival, quality of life, and costs were not significantly different after 2 years for the two methods of AAA repair, with non-significant trends in survival and cost favoring endovascular repair.





### Does Morphology of Carotid Plaque Depend on Patients' Redox Status?

1 Migdalski, A, 2 Rózański R; 2 Gackowski D, 3 Majer M, 1 Jawien A, 2 Olinski R

1 Dept of Surgery; 2 Dept of Clinical Biochemistry; 3 Dept of Angiology; Nicolaus Copernicus University, Collegium Medicum in Bydgoszcz, Poland

**Introduction**  
**Aim of the study** Some experimental evidence indicate that inflammation associated with oxidative stress/DNA damage is one of the major mechanisms, which may be involved in atherosclerosis pathogenesis. To date, there have been no data concerning the relationship between oxidative stress biomarkers and stability of carotid plaque. Therefore, we decided to analyze the broad range of parameters describing redox status in patients with carotid stenosis.

**Materials/**  
**Methods** 124 consecutive patients undergoing carotid endarterectomy were enrolled in the study group. The control group consisted of 49 patients without symptoms of atherosclerosis. The stability of carotid plaques was assessed using GSM scoring system (Plaque Texture Analysis Adlare Ltd. Version 3.3) and the study group was divided into three subgroups according to echogenicity of the plaque (GSM <25, GSM 25-50, GSM >50). The following parameters of oxidative stress/DNA damage were analyzed: i/ urinary excretion of the products of oxidative DNA damage repair (8-oxodG and 8-oxoGua); ii/ the background level of 8-oxodG in leukocytes' DNA and in atherosclerotic plaques; iii/ the concentration of antioxidant vitamins (A, C, E), uric acid and hsCRP in plasma.

**Results** Our main findings are as follows: i/ background level of 8-oxodG was 2.6 fold higher in DNA isolated from the plaques than that in leukocytes DNA (12 and 4.6 8-oxodG/106dG respectively); ii/ there is negative correlation between redox status of the patients (expressed as the ratio of geometric means of all analyzed antioxidants and oxidative stress/DNA repair biomarkers) and stability of the plaque (expressed as GSM score). Echolucent plaques (GSM<25) were associated with the highest antioxidants level and lowest excretion of DNA repair markers.

**Conclusions** The results presented herein suggest that redox status may play a role in development of the disease and may have some influence on stability of the plaque itself.

### Association Between Plaque Echogenicity and Embolic Material Captured in Filter During Protected Carotid Angioplasty And Stenting.

Giannakopoulos TG, Moulakakis K, Sfyroeras GS, Avgerinos ED, Antonopoulos CN, Kakisis JD, Alepaki M, Karakitsos P, Brountzos EN, Liapis CD

Department of Vascular Surgery, University of Athens Medical School, "Attikon" University Hospital, Athens, Greece

**Introduction**  
**Aim of the study** Filter embolic protection devices (EPD) are routinely employed during carotid angioplasty and stenting (CAS) to avoid cerebral embolization. The aim of the study is to investigate the incidence and the nature of embolic material captured in filter EPD using the liquid based cytology technique (Thin-Prep®) and possible correlation with plaque echogenicity and other risk factors.

**Materials/**  
**Methods** Between June 2010 and March 2011, 51 consecutive patients (11 females, mean age 71.2 +/-7, 10 symptomatic) who underwent 53 CAS procedures were included in this prospective study. Preoperative CT brain scans and ultrasonographic plaque type characterizations were obtained in all cases. All procedures were performed under local anesthesia using the same type of stent and filter EPD. Filters were collected and after macroscopic evaluation, they were examined using liquid based cytology technique (Thin-Prep®).

**Results** Technical success was 100%. Thirty day stroke and death rates were 1.8% (1/53) and 0% respectively. Visible debris was detected in 8 (15%) filters, whereas liquid based cytology revealed the presence of embolic material particles in 30 filters (56.6%). These included foam particles with microvesicle appearance in 13, pale plaque fragments in 11, and compact plaque fragments in 6 filters. The presence of embolic material into the filter EPD was 2.38 fold increased for every category change from type IV to type I carotid plaques (OR=2.38, 95%CI=1.15-4.93). This association remained robust even after adjustment for age, gender and known atherosclerotic disease risk factors (OR=2.26, 95%CI=1.02-5.02). In multivariate analysis for risk factors hypertension was associated with increased presence of embolic material detection in filter EPD (OR=20.4, 95%CI=1.28-326.1).

**Conclusions** Examination of the filter EPD using liquid based cytology revealed the presence of embolic material in 56.6% of them. Echolucent plaques and hypertension were associated with increased presence of embolic material.





### Analysis of Stroke after TEVAR Involving the Aortic Arch.

Melissano G, Bertoglio L, Kahlberg A, Tshomba Y, Civilini E, Chiesa R

Division and Chair of Vascular Surgery University "Vita-Salute" San Raffaele Scientific Institute, Italy

<b>Introduction</b>	Stroke is a major source of concern after open, endovascular or hybrid aortic arch repair. The aim of this study is to analyse the incidence of stroke after hybrid repair of aortic disease involving the arch.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	In the last decade, 387 patients received TEVAR at our Institution; in 141 cases the aortic arch was involved. "Zone 0" patients (31) received supra-aortic arteries de-branching through sternotomy, including the left subclavian artery (LSA) in 3 cases. "Zone 1" patients (34) received extra-anatomic revascularization of the left common carotid artery and the LSA in 7 cases. In "Zone 2" patients (76) the LSA was revascularized selectively in 59 cases. The LSA was ligated or occluded with a plug in 47 cases before stent-graft (SG) deployment.
<b>Results</b>	Initial clinical success, mortality and spinal cord ischemia in TEVAR patients with or without arch involvement were respectively: 87.8% vs. 93.1%, 4.6% vs. 2.7% and 1.5% vs. 3.7%. Patients with arch involvement had a stroke rate of 3.1% vs. 1.1% in patients without. The stroke rate was 10.3% ( $P<0.02$ ) in "Zone 0", 0% in "Zone 1", and 1.4% in "Zone 2". Three strokes were cerebellar and one hemispheric, all fatal and associated with multi-organ embolization. The scans showed severe atheroma and/or thrombus in the arch in all cases. Stroke was observed in patients with (3.4%) or without (2.7%) LSA revascularization, however it was never observed in patients in whom the LSA was occluded before SG deployment and in 4.7% of patients in whom it was patent at the time of SG deployment.
<b>Conclusions</b>	Stroke after TEVAR is not infrequent especially when the arch is involved. Its origin is mostly embolic and possibly related to endovascular manipulation. Better patient selection together with a strategy to reduce embolization such as occlusion of supra-aortic trunks before SG deployment may play a beneficial role.

### Pathology Specific Neurological Outcome Following Thoracic Endovascular Aneurysm Repair (TEVAR): Is There A Difference Between Aneurysm And Dissection?

Clough RE, Lyons O, Patel AS, Bell RE, Carrell TWG, Waltham M, Zayed H, Taylor PR

Guy's & St Thomas' NHS Foundation Trust, London, United Kingdom

<b>Introduction</b>	TEVAR has become the treatment of choice for nearly all diseases affecting the thoracic aorta. The two most common pathologies are aneurysm and dissection. Some series show that the incidence of paraplegia is lower in dissection compared with aneurysm and that stroke is higher in aneurysm than dissection. The results of a consecutive series of patients were analysed to detect any effect of pathology on outcome.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	A consecutive series of patients who had TEVAR at a single institution was entered prospectively onto a computerised database. Retrospective analysis was performed to look at pathology related outcome. Factors analysed included death, stroke and paraplegia. The Chi squared test was used to analyse statistical significance.
<b>Results</b>	317 consecutive patients were entered into the study of whom 221 were elective and 96 were urgent. 11 elective patients died (5%) and 15 urgent patients (15.6%; $p=0.003$ ). 12 out of 199 aneurysm patients became paraplegic (6%) compared with 7 of 118 dissections (5.9%; $p=1.0$ ). Stroke affected 12/199 aneurysm patients (6%) and 7/118 dissections (5.9%; $p=1.0$ ). If the results for pathology were further analysed by mode of admission: Paraplegia affected 9/160 (5.6%) elective aneurysms and 2/61 (3.3%; $p=0.37$ ) dissections compared with 3/39 urgent aneurysms (7.7%) and 5/57 (8.8%; $p=1.0$ ). Stroke affected 7/160 (4.4%) elective aneurysms compared with 1/61 elective dissections (1.6%; $p=0.45$ ). Stroke affected 5/39 (12.8%) urgent aneurysms and 6/57 (10.5%; $p=0.75$ ) urgent dissection patients.
<b>Conclusions</b>	Urgent presentation was found to have a worse mortality compared with patients presenting electively. However, there was no difference between patients presenting with either aneurysms or dissections. Stroke and paraplegia were also not significantly different between the groups. These findings are in accord with those of other groups. Improvements in outcome may result from measures to prevent urgent presentation such as screening for thoracic aneurysms and better medical treatment to prevent dissection.

### A Prospective Population-Based Study of the Incidence and Outcome of Acute Aortic Dissection: Implications for Pre-Morbid Risk Factor Control and Limitations of IRAD.

Howard DPJ, Banerjee A, Fairhead JF, Rothwell PM  
University of Oxford, Oxford, United Kingdom

<b>Introduction</b>	Although there are no reliable population-based data on the incidence and outcome of acute abdominal aortic aneurysm (aAAA) events by age and sex, a new screening programme in our country is confined to men aged 65 years. Estimates of the effectiveness of screening are also based on studies that excluded older age groups. We aimed to determine whether event rates at older ages in either sex justify extension of screening programmes.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	We prospectively determined incidence and outcomes for all acute aortic events and interventions irrespective of age by studying a population of 91,520 residents during 2002–2009. We report rates per 100,000 population per year, by age and sex.
<b>Results</b>	Of 130 acute non-occlusive aortic events in 118 patients (mean 75.8-years, 74% male), 62 (47.7%) were ruptured/leaking abdominal aortic aneurysms (RAA) (incidence=9/100,000; 95%CI=7–12) and 29 (22.3%) were acutely symptomatic aneurysms (SAA) (4/100,000; 3–6). Incidence of aAAA increased steeply with age, with a clear male predominance at younger ages, but rates in women at $\geq 75$ -years (55/100,000) were similar to those in men aged 65–74-years (58/100,000). 30-day mortality was 72.2% for RAAs and 11.1% for SAAs, with the highest aneurysm-related mortality at age $\geq 80$ (60.0% vs 47.8%). 43.2% aAAA and 48.8% of related mortality occurred in the over-80s. All female aAAA patients had known pre-morbid hypertension vs 55.7% of males ( $p < 0.001$ ). Only 16.0% (10 males: 3 females) of individuals with incident aAAAs had a known aneurysm prior to event.
<b>Conclusions</b>	Our findings raise concerns about the coverage of aneurysm screening programmes. First, incidence of aAAA in older women is high and screening women with hypertension at age $\geq 75$ -years would potentially identify 75% of women who would go onto to have aAAA events (18.5% of the total aAAA event burden). Second, the high incidence of aAAA events in the over-80 population, taken with the fact that most aneurysms expand by about 10% per year, suggests that the majority of aneurysms causing aAAA events in the over-80s would have not been present on a one-off screening scan at age 65 and repeat scanning would therefore be warranted.

### Changes in Arterial Stiffness and Serum Osteoprotegerin in Patients Undergoing Endovascular Repair of Abdominal Aortic Aneurysms.

Kadoglou NPE, Moulakakis KG, Papadakis I, Maustardas P, Ikonomidis I, Alepaki M, Kakisis J, Avgerinos ED, Lekakis J, Liapis CD

Department of Vascular Surgery, University of Athens, Attikon Hospital, Greece – 2nd Cardiology Department, – Department of Cytopathology, All University of Athens, Attikon Hospital, Greece

<b>Introduction</b>	Pulse wave velocity (PWV) is a valid, clinically feasible, measure of arterial stiffening and a strong predictor of future cardiovascular events mortality. The aim of our study was to assess changes in PWV and serum levels of osteoprotegerin (OPG), a valid biochemical marker of vascular calcification and cardiovascular mortality, in patients undergoing endovascular repair (EVAR) of abdominal aortic aneurysm (AAA).
<b>Aim of the study</b>	
<b>Materials/Methods</b>	Sixty-eight consecutive patients underwent elective EVAR (AAA group) after exclusion of patients with Marfan syndrome or other collagen-related disorders. Thirty-one sex-matched individuals, without overt cardiovascular disease, served as controls (CO group). PWV, clinical parameters and serum OPG levels were determined at baseline and prospectively after 6-months. Student's t-test, paired-samples t-test, univariate and multiple regression analysis were used for statistical analysis ( $p < 0.05$ ).
<b>Results</b>	Our groups did not differ in demographic characteristics, lipid profile and blood pressure levels ( $p > 0.05$ ). PWV was found considerably higher in AAA group ( $12.61 \pm 4.01$ m/s) compared to CO group ( $7.97 \pm 2.17$ m/s, $p < 0.001$ ). Similarly, serum OPG was elevated in AAA ( $15.45 \pm 2.25$ pmol/L) vs CO ( $7.06 \pm 2.25$ pmol/L, $p < 0.001$ ). In AAA group, PWV positively correlated with mean blood pressure ( $r = 0.431$ , $p = 0.001$ ), and AAA diameter ( $r = 0.323$ , $p = 0.037$ ), after adjustment for age. Multiple regression analysis identified the latter parameters as independent determinants of PWV ( $R^2 = 0.435$ , $p = 0.017$ ). In the present ongoing study, follow-up measurements were available in 27 patients. At 6 months, we observed a non-significant change in BP ( $p > 0.05$ ), while PWV significantly increased ( $+3.82 \pm 1.61$ m/s, $p = 0.004$ ) and serum OPG considerably decreased ( $-3.22 \pm 0.88$ pmol/L, $p = 0.018$ ).
<b>Conclusions</b>	Arterial stiffness and serum OPG are significantly increased in patients with AAA compared to healthy controls. Mean blood pressure and AAA diameter seem to constitute independent determinants of PWV in AAA. Our preliminary data show increased arterial stiffness after EVAR and decreased serum OPG; whether those changes determine the cardiovascular risk in AAA and to what extent needs further investigation.

**Identifying patients at risk of renal failure following open elective AAA repair**

1 Grant SW, 2 Grant MJ, 3 Grayson AD, 4 Sekhar H, 4 Purkayastha D, 1 McCollum CN

1 University of Manchester; 2 Warrington District General Hospital; 3 University Hospital of South Manchester; 4 Southport and Ormskirk NHS Hospitals; United Kingdom

**Introduction**  
**Aim of the study** Renal failure is a recognised complication of open elective AAA repair and is associated with prolonged hospital stay, lifelong dialysis and increased mortality. We have analysed a large surgical database to identify risk factors for the development of acute renal failure following open elective AAA repair.

**Materials/**  
**Methods** Peri-operative data was collected on 2,347 consecutive patients from 22 hospitals who underwent open elective AAA repair from January 2000 - December 2010. Patients with significant renal impairment (preoperative serum creatinine > 200 µmol/L) were excluded. Renal failure was defined as the requirement for post-operative renal-replacement therapy. Logistic regression analysis was undertaken using a forward-stepwise technique to identify risk factors for post-operative renal failure. A simplified clinical risk prediction model was produced.

**Results** Post-operative renal failure occurred in 140 (6.0%) patients . Post-operative renal failure was associated with age >75 (odds ratio [OR]=1.58, 95% confidence interval [CI] 1.11-2.26), symptomatic AAA (OR=1.77, CI 1.24-2.52), pre-operative creatinine >150 (OR=2.76, CI 1.69-4.50), medically treated hypertension (OR=1.87, CI 1.28-2.74), a history of respiratory disease (OR=2.08, CI 1.45-2.97) and supra/juxta renal AAA repair (OR=2.17, CI 1.32-3.57). The 30-day mortality in patients who developed post-operative renal failure was 35.0% compared with 4.3% in those patients who did not (p<0.001).

**Conclusions** Renal failure following open elective AAA repair was associated with a significantly increased risk of 30-day mortality. Six risk factors were identified as being associated with post-operative renal failure. A simplified scoring system was produced which may facilitate the implementation of focussed care strategies for high-risk patients.

Notes

Horizontal lines for taking notes.

## Notes

### A Comparison of Practice in Lower Limb Bypass Surgery in 9 Countries Using the Vascunet Collaboration.

Lees T, Troeng T, Thompson I, on behalf of the Vascunet Committee  
Vascunet Committee of the European Society of Vascular Surgery

17.

<b>Introduction</b>	Infrainguinal bypass surgery is one of the most common procedures in vascular surgery and has been well described and studied for decades. One might expect practice and outcomes to be uniform throughout the world. In the last few years the members of several large national vascular registries have collaborated to compare infrainguinal bypass procedures at a national level through the Vascunet Committee of the European Society of Vascular Surgery, over a 5 year period.
<b>Aim of the study</b>	
<b>Materials/ Methods</b>	A table of data fields and definitions was agreed by all member countries of the Vascunet Collaboration. Data was submitted by all countries to a central database for the period January 2005 to December 2009. Analysis of the data was performed using SPSS Program package. Categorical variables were compared with Chi-squared test and continuous variables with Students t-test or Mann-Whitney U test.
<b>Results</b>	<p>44,059 cases of infrainguinal bypass (IIB) in 9 countries were analysed. The numbers of procedures per 100,000 population varied between 2.3 in our country and 64.5 in a southern European country. The proportion of women undergoing IIB varied from 27.3 % to 43.5 %. The median age for all countries was 70 for men and 76 for women with patients being treated at a significantly younger age in an eastern European country. IIB was performed for claudication for between 15.7% and 40.8% of the total procedures performed. Vein grafts were used in patients operated on for claudication (52.9%), for rest pain (66.7%) and tissue loss (74.1%).</p> <p>A southern European country had the highest use of synthetic grafts and the lowest use of vein grafts. 45% of bypasses for claudication were performed to the below knee popliteal artery or a more distal vessel. Graft patency at 30 days varied between 86% and 99%.</p>
<b>Conclusions</b>	Significant variations in practice have been demonstrated between countries with regard to IIB. Variation in data completeness and data validation between countries requires evaluation as part of further investigation into these differences in practice.

SS 4

### Factors Influencing Wound Healing of Critical Ischemic Foot after Bypass Surgery. Is Angiosome Important to Decide Bypass Target Artery?

Azuma N, Uchida H, Koya A, Kokubo T, Akasaka N, Inaba M, Sasajima T

Division of Cardiovascular Surgery, Department of Surgery, Asahikawa Medical University, Asahikawa, Japan

<b>Introduction</b>	Although lots of clinical studies have documented limb salvage rate of critical ischemic limb(CIL), achievement of complete healing of ischemic wound and the factors affecting ischemic wound healing rarely reported.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	Two-hundred forty-nine CILs with tissue loss due to atherosclerotic infragenicular lesions in 228 patients were retrospectively studied. Eighty percent of patients were diabetes, and 49% of patients were dialysis-dependent renal failure(ESRD). All limbs were treated by bypass first strategy in single institution from 2003 to 2009, and the distal anastomotic site of bypasses were crural artery(57%) or pedal artery(43%). The ischemic ulcers or gangrenes underwent debridement subsequent topical treatment such as negative pressure therapy, and some of them underwent free flap transfer(6%).
<b>Results</b>	Operative death were 0.9%. The cumulative primary, secondary graft patency rate, and limb salvage rate were 55.7, 85.5, 92.3% at 5 years, respectively. The complete healing of ischemic wounds were achieved in 211 limbs(84.7%). Cumulative wound healing rate was 72.2% at 6months and 86.9% at one year. ESRD was most strong factor of wound healing failure(OR 6.7, p<0.001). Low serum albumin level below 3.0g/dL (OR 4.6, p<0.001), extensive tissue loss categorized Rutherford grade 6 (OR 4.7, p<0.001), and heel ulcer(OR 3.8, P<0.001) were also inhibiting factors of wound healing.
<b>Conclusions</b>	High wound healing rate can be achieved by bypass surgery in patients without ESRD, regardless of angiosome. In patients with ESRD, however, angiosome concept seemed important because tissue loss in such patients tended to involve large area which stride across more than two angiosomes and the connecting vessels between angiosomes tended to be compromised. Although ESRD patients with severe low albumin level might not fit bypass surgery because of high risk of poor wound healing potential and infection, most critical ischemic limbs in ESRD patients with normal albumin level can be salvaged by bypass surgery.

### Indocyanine Green Fluorescence Imaging in Assessment of Critically Ischemic Foot

1 Venermo M, 2 Terasaki H, 1 Aho PS, 1 Vikatmaa P, 1 Albäck A, 2 Sugano N, 1 Lepäntalo M

1 Helsinki University Hospital, Department of Vascular Surgery, 2 Tokyo Medical and Dental University Hospital

<b>Introduction</b>	Assessment of a critically ischemic limb is challenging. Toe pressures (TP) and TcPO <sub>2</sub> are traditionally used. The indocyanine green (ICG) fluorescence imaging device can be used to evaluate local circulation in foot and assess severity of the ischemia.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	We tested the usefulness of a fluorescence imaging system (photo-dynamic eye (PDE), Hamamatsu Photonics K.K. Hamamatsu, in assessment of foot ischemia in diabetics and nondiabetics
<b>Materials/Methods</b>	45 consecutive patients with critical limb ischemia (20 diabetics) underwent ABI-, TP- TcPO <sub>2</sub> -measurements and fluorescence-imaging. 1 ml (5 mg/ml) indocyanine green was injected intravenously. The image of the foot was recorded 5 minutes and from the recorded images, fluorescence intensity in the dorsum of the foot was plotted as a time-intensity curve. The time was needed reach half value of the maximum fluorescence intensity was measured (T <sub>1/2</sub> ). Fluorescence intensity was measured at 10 seconds from uprising point (PDE10) and it was compared to TcPO <sub>2</sub> at the same area (n=120). Cut off value 40 mmHg to detect CLI was used and tested against PDE10 using ROC-curve. Data are expressed as mean (SD, range).
<b>Results</b>	The mean ABI was 0.41(0.36; 0-1.6), TP 20(13; 0-45), TcPO <sub>2</sub> 23(16; 1-77), T <sub>1/2</sub> 39(24; 10-110) and PDE10 18(18; 1-88). There was no significant difference between diabetics and nondiabetics these values.
<b>Conclusions</b>	PDE showed ischemic patches at foot indicating variability in circulation at foot level. In 10 patients TP was ≥30 mmHg, in 20 patients <30 mmHg. T <sub>1/2</sub> in these patients was 30 s and 43 s respectively (p<0.05). In ROC-curve using TcPO <sub>2</sub> level 40 mmHg the cut off value of PDE10 was 21 s (AUC 0.69; sensitivity 61%, specificity 73%; in diabetics AUC 0.83, sensitivity 88%, specificity 68%, in nondiabetics AUC 0.64; sensitivity 60%, specificity 65%).
<b>Conclusions</b>	ICG fluorescence imaging is a useful tool to measure foot circulation. It is quicker than TcPO <sub>2</sub> and gives more information on ischemic regions in the dorsum of the foot than plain TP. It can be done almost all patients. Further research is needed to evaluate the usefulness of PDE in assesment of circulation in angiosomes as well as in predicting wound healing.

### Endurance Athletes with Intermittent Claudication caused by Iliac Artery Stenosis treated by Endarterectomy and Vein Patch.

1 Bender MHM, Schep G, 2 Bouts SW, 3 Backx FJG, 4 Moll FL

1 Máxima Medical Centre Veldhoven, Dept of Surgery, 2 Dept of Sports Medicine, 3 University Medical Centre Utrecht, Dept of Sports Medicine, 4 Dept of Vascular Surgery, The Netherlands

<b>Introduction Aim of the study</b>	Endurance athletes can complain of typical intermittent claudication seriously hampering their sportive capacities. A precise diagnostic protocol can identify an endofibrotic iliac artery stenosis. When the patient experiences his complaints as seriously incapacitating operative treatment can be considered. Endarterectomy with venous patching seems the best option above angioplasty, stenting or artificial grafts.
<b>Materials/ Methods</b>	Athletes with claudication-like complaints were analysed with a specially adapted test protocol including provocative echo-doppler and cycling test. When iliac flow limitation was demonstrated MR-angiography was performed. Five patients were found to have an occlusion, 31 patients a stenosis of the iliac artery. Endarterectomy and venous patching was performed in 36 endurance athletes with 37 symptomatic legs. Mean age was 35 years. Post-operative the same diagnostic protocol was used for objective evaluation.
<b>Results</b>	After a mean follow up of 29 months 19 athletes were completely symptom free and 9 athletes could perform on the desired level with minor remaining complaints. Two athletes were satisfied with their improvement though minor complaints prohibited return to the competition level at which they performed before the complaints started. Two patients developed a re-stenosis and became symptom free after re-operation. One patient had remaining symptoms due to lysis of the lumbar spine, two patients had objective improvement but limited decrease in symptoms, one patient was not satisfied but refused postoperative tests. The only major surgical complication was a postoperative bleeding necessitating re-operation. Postoperative tests showed a statistically significant increase in maximal work load (5,35 Watt/kg to 5,70 Watt/kg, $p=0,005$ ) as well as in postexercise ankle brachial index (0,45 tot 0,59, $p<0,001$ ). In 28 patients the vessel diameter increased with an average of 36% on MRA and/or echo-duplex. No aneurysm formation was detected.
<b>Conclusions</b>	Precise diagnosis and meticulous performed endarterectomy with vein patching has satisfactory results with acceptable risk in endurance athletes with intermittent claudication due to iliac artery stenosis.

### Results of Popliteal Artery Repair in Blunt Injuries.

Klocker J, Bertoldi A, Wachter B, Hoh A, Fraedrich G

Medical University Innsbruck, Austria

<b>Introduction Aim of the study</b>	Analysis of immediate and long-term outcome after popliteal artery reconstruction in blunt trauma.
<b>Materials/ Methods</b>	All patients who underwent repair of popliteal artery lesions after blunt injuries in our institution since January 1990 were included, analysed and followed. Study endpoints were: Rates of perioperative death (30 day mortality), early and long-term limb salvage, primary and secondary patency and vascular re-intervention.
<b>Results</b>	A total of 58 patients (49 male; median age: 35.2 yrs; range: 12.4-81.0) who presented with 59 popliteal artery lesions (28 intimal fractures, 31 transections) after blunt trauma underwent emergent repair (4 direct sutures, 3 patch angioplasties, 51 saphenous vein interpositions and 1 PTFE graft). Median Mangled Extremity Severity Score (MESS) was 7 (range: 3-11). Preoperatively, forty-nine legs (83%) presented with ischemia. Median time until revascularisation was 7.5 hours (range: 3-36), and fasciotomy was performed in 64% of the patients. Early results (within 3 months after repair): survival rate was 98%; limb salvage rate was 86%. Eight early occlusions of the arterial repair occurred, all but one within 2 days postoperatively (primary patency rate: 86%). All occlusions were revised successfully. Long-term results (after a median follow-up period of 5.9 years; range: 0.4-16.9): long-term limb salvage rate was 79%. Long-term patency rate: 93%. Late amputations were unrelated to arterial occlusions.
<b>Conclusions</b>	Emergency repair of blunt popliteal artery injuries is associated with considerable risk of early occlusion and limb loss. In our experience, amputations were indicated mostly due to extensive soft tissue injury and progressive infection. Frequently, patients are presenting with leg ischemia and require fasciotomy after repair. In blunt injuries, the majority of patients undergo vein graft interposition. During long-term follow-up, occlusion of arterial repair is rare.





## Treating Fresh Arterial Allograft as a True Transplanted Organ gives Promising Mid-term Results when used in the Treatment of Vascular Prosthetic Infection and Selected Aortic Pathology.

Sebesta P

Surgery Department, Central Veterans Hospital, Prague, Czech Republic

<b>Introduction</b>	An institutional clinical experience with the use of the fresh arterial allografts and mid-term treatment results of the aortic or aortofemoral prosthetic infection is presented.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	During the last decade (2001-2004) the cohort of 25 patients (23 with the infected graft in aortic/aortofemoral position, one infected endograft and one mycotic aneurysm) were operated with the use of the fresh arterial allograft. Male/female ratio was 16/9, average age 65 (36-81) years. The total of 71 previous vascular operations (1-9; m.2,9/patient) were performed within the 5,8 years' median between the first and the last procedure. Eight patients had sepsis (32%), aortoenteric fistula occurred in three. Various technical patterns of the aortobifemoral (13), aortounifemoral (8) bypass, aortic and aortoiliac replacement (4) were performed. The arterial allograft was stored at 4°C following harvest minimizing the warm ischemic time and used within 8-48 hours thereafter (the median cold ischemic time of 20 hours). Perioperatively, all patients were given Cyclosporine A and immunosuppressive therapy has continued for life.
<b>Results</b>	In-hospital mortality was 20% (5/25), twice caused by postoperative hemorrhage from either the aortic anastomosis or the graft necrosis. The remaining deaths were not graft-related. Two limbs, ischaemic preoperatively, were amputated. The median follow-up is 4,5 years (3m.-8 yrs.). The three-year survival was 70 % and the known causes of death had no relation to the allograft. The late occlusion of the graft limb occurred twice, stenoses within its course twice and also three femoral anastomotic stenoses were disclosed. All were treated both openly and by PTA/stent and the redo procedures' rate has thus reached 20% in the mid-term follow-up interval. Since, no graft deterioration was observed unless a slight diffuse dilatation in one allograft requiring but follow-up.
<b>Conclusions</b>	Treated preferably as a transplanted organ rather than a tissue, i.e. under the strictly held rules of basic immunological concordance and ongoing postprocedural immunosuppression, the shortly ischemic arterial allograft tends to keep its structural integrity probably better. As such represents more than ever a valuable alternative of the surgical treatment of the vascular prosthetic infection and mycotic aneurysms in the aortic/aortofemoral position.

## Rifampicin-soaked Silver versus Polytetrafluoroethylene Grafts for In Situ Replacement of Graft Infection in a Porcine Randomized Controlled Trial

Hong G, Sandermann J, Prag J, Lund L, Lindholt J

Vascular Research Unit, Department of Vascular Surgery, Viborg Hospital, Denmark

<b>Introduction</b>	The treatment of prosthetic vascular graft infection is a challenge and in spite of improvement in sterile operative conditions, surgical techniques, and use of routine prophylactic antibiotics. However, the seldom frequency inhibits human randomised clinical trials to establish the optimal treatment. Consequently, we aimed to compare the efficacy of in situ replacement with rifampicin-soaked silver-coated polyester (RSSCP) to expanded polytetrafluoroethylene (ePTFE) grafts in a porcine model for early aortic prosthetic vascular graft infection.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	Sixty pigs had grafts with a diameter on 8 mm implanted end-to-end in the infrarenal aorta, and the grafts were inoculated with approx. 10 <sup>6</sup> Staphylococcus aureus. All developed S. aureus prosthetic vascular graft infection. Two weeks later, all 52 surviving pigs were randomized 1:1 to undergo in situ graft replacement with ePTFE grafts or RSSCP grafts plus postoperatively oral administration of 300 mg rifampicin and 750 mg ciprofloxacin twice a day for 3 weeks until euthanasia and autopsy. In situ perigraft swabs and graft material were analyzed for S. aureus quantitatively.
<b>Results</b>	Only one out of 25 RSSCP grafts were infected with S. aureus, whereas 15 of 27 ePTFE grafts were still infected with S. aureus after 3 weeks (OR=0.022, 95%CI: 0.002, 0.219, P = 0.001).
<b>Conclusions</b>	In situ replacement with RSSCP grafts and oral rifampicin plus ciprofloxacin is more efficient to eradicate S. aureus prosthetic vascular graft infection than ePTFE grafts treated with same oral antibiotics in a porcine aortic prosthetic vascular graft infection model.

### Evaluating the Patient Benefit Achievable from Revascularization in Critical Limb Ischemia using a Patient-oriented Scoring System.

Chisci E, Perulli A, Setacci F, de Donato G, Iacoponi F, Palasciano G, Cappelli A, Setacci C

Department of Surgery, Vascular and Endovascular Surgery Unit, University of Siena, Siena, Italy

**Introduction**  
**Aim of the study** The concept of patency and limb salvage are physician-oriented endpoints in critical limb ischemia (CLI). These endpoints have failed to enhance patient function after revascularization (RE). The aim of this prospective study is to create a scoring system in order to predict the 1-year functional status after RE and to assess the patient benefit achievable from RE.

**Materials/**  
**Methods** During the period 2007–2009, consecutive patients, underwent repair for CLI. Pre-operative, operative and functional status characteristics and post-operative outcomes were recorded. As patient-oriented outcomes (functional status) the basic and instrumental activities of daily living (BADL, IADL), the ambulatory and the living situation were investigated pre and post-operatively. A scoring system was generated using Arabic numerals for all variables to preoperatively grade the individual patient risk of 80% of losing the baseline function status at 1 year (e.g. dependent ambulatory or living status, bed ridden condition).

**Results** There were 480 patients, mean age 76.2 years; 93 (19.3%) showed Rutherford class IV, 208 (43.3%) Rutherford class V and 179 (37.4%) Rutherford class VI. Surgical, endovascular and hybrid interventions were performed respectively in 108 (22.5%), 319 (66.5%) and 53 (11%) patients. At 1 year, an improved or unchanged functional status was observed in 57.5% (276) patients. BADL and IADL modified from pre-operative mean values of 4.25 and 3.99 to 1-year follow-up mean values of 4.29 and 4.11. At the same time interval, mortality was 14.2%, limb salvage 80.8%, CLI related new hospitalizations 51.7%, relief of symptoms 18.5% and tissue healing 14.5%. Positive, negative and null factors for post-operative modification of the functional status are showed in table 1. A scoring system was developed from these factors and predicted a 80% risk of losing the baseline functional status if the score was  $> -3.00$  with a sensitivity of 88.2% and specificity of 89.9%

**Conclusions** Considering patient-oriented outcomes, our study showed that revascularization could be worthwhile in less than 60% of patients with CLI. Our scoring system seems to be a useful tool to help select patients who benefit most from revascularization and those where primary amputation or palliation should be considered. This study needs to be validated in independent cohorts at a variety of centers before it can be recommended for application.

### Delay Influences Outcome after Lower Limb Major Amputation.

Moxey PW, Hofman D, Jones KG, Hinchliffe RH, Thompson MM, Holt PJ

St George's Vascular Institute, London, United Kingdom

**Introduction**  
**Aim of the study** To investigate if a relationship exists between the time taken between admission to hospital with critical limb ischaemia (CLI) and performing surgery for major amputation and the subsequent outcome from these procedures.

**Materials/**  
**Methods** In one country, all patients undergoing major lower limb amputation, between April 2002 and March 2006, for CLI, were identified from the Hospital Episodes Statistics (HES) data. Amputations related to trauma or malignancy were excluded.

The length of wait (LOW), defined as the date of admission to the date of major amputation, was calculated. A two-level logistic regression model was used to investigate if LOW had a significant effect on post-operative convalescence, in-hospital all-cause mortality or one-year all cause mortality.

Risk estimates were adjusted for age, gender, Charlson score, social deprivation indices, previous vascular interventions (bypass, angioplasty or no intervention) and mode of admission (emergency vs. elective).

**Results** 14,168 major amputations were identified. 13,098 (92.0%) had no intervention prior to amputation on that admission although 6135 (43.3%) had had attempted revascularisation in the preceding 3 years.

Length of Wait (LOW) significantly prolonged recuperation in men (Exponential Estimate 1.01 1.01–1.02  $p < 0.0001$ ) and women (EE 1.02 1.01–1.02  $p < 0.0001$ ) and increased in-hospital and one year mortality in men (In-hospital mortality OR 1.02 1.02–1.03  $p < 0.0001$ , 1-year mortality OR 1.01 1.01–1.02  $p = 0.0002$ ).

LOW had a trend level effect on female in-hospital (OR 1.01 1.00–1.02  $p = 0.1216$ ) and one year (OR 1.01 1.00–1.02  $p = 0.0764$ ) mortality.

**Conclusions** Delays either making the decision to amputate, or in performing amputation, have a negative effect on patient outcome in terms of overall length of stay and mortality after major lower limb amputation. Decision-support tools and easier access to theatres are needed to improve the mortality outcome and length of stay from major amputation.

**The FePox Study: Thin Wall Fluoropassiv Externally Supported or Thin Wall Fluoropassiv Non-Externally Supported Graft for Femoropopliteal Above-Knee Bypass Grafting: Two-year Results of a Multicentre Randomised Trial.**

1 Vriens BHR, 1 van Det RJ, 1 van der Palen J, 1 Meerwaldt R, 2 van Baal SG, 3 van der Sar P, 4 Tordoir JHM, 5 an Loenhout RMM, 1 Geelkerken RH

1 Medisch Spectrum Twente Hospital, Enschede; 2 Twenteborg Hospital, Almelo; 3 General Hospital Midden Twente, Hengelo; 4 Academical Hospital, Maastricht; 5 Jeroen Bosch Hospital, Den Bosch, The Netherlands

<b>Introduction</b>	Above-knee (A-K) femoropopliteal bypass grafting is an effective treatment for either disabling claudication or critical ischemia. Although autologous material is preferred, prosthetic graft material is still frequently used in the absence of a saphenous vein.
<b>Aim of the study</b>	Structure of the prosthetic graft may have an impact on graft patency. Externally support should enable use of a noncrimped graft without danger of kinking of the bypass.  A randomised multicentre clinical trial was designed to compare thin wall fluoropassiv(tm) externally reinforced(F-EXS) and thin wall fluoropassiv(tm) non-externally reinforced(F-non-EXS) for A-K bypasses.
<b>Materials/ Methods</b>	Between 1999 and 2008, 277 A-K femoropopliteal bypass grafts (6 mm in diameter) were performed, 140 F-EXS and 137 F-non-EXS. Follow-up was done by clinical examination, ankle-brachial index and duplex ultrasound at scheduled intervals. The main endpoint was primary patency of the bypasses two years after implantation. Secondary endpoints were mortality and primary assisted patency. Cumulative patency rates were calculated.
<b>Results</b>	Patients characteristics were similar in both groups. The Rutherford classification showed a distribution of 67.7% CLI category 1,2,3 (4.0%, 23.4%, 40.3%), 11.7% CLI category 4, 19.8% CLI category 5 and 0.8% CLI category 6.  After two years only four(1.4%) patients were lost to follow-up. The postoperative 30-day mortality rate was 1.4%. After 2 years 37(13.4%) of the patients died of which 26(70.3%) had a primary patent bypass. After two years the primary patency rates for F-EXS and F-non-EXS were respectively 50.5% vs 70.0% (p=0.005). The two year primary and primary assisted patency in the F-EXS cohort was 67.4% and in the F-non-EXS 83.0% (p=0.01).
<b>Conclusions</b>	In contrast with our expectations the patency results of the F-EXS cohort were significantly worse than the F-non-EXS cohort. Additional analyses will be performed to explain this difference.

**Prevention of Vascular Graft Infections with Antibiotic Graft Impregnation at the Time of Implantation: In Vitro Comparison between Daptomycin, Rifampin and Nebacatin**

Bisdas T, Beckmann E, Marsch G, Burgwitz K, Kuehn C, Haverich A, Teebken OE

Division for Vascular Surgery, Hannover Medical School, Hannover, Germany

<b>Introduction</b>	In this in-vitro experimental study we investigated the efficacy of graft impregnation with either nebacetin (neomycin plus bacitracin) or rifampin or daptomycin in preventing vascular graft infections (VGI).
<b>Aim of the study</b>	
<b>Materials/ Methods</b>	All antibiotics were tested against <i>S.epidermidis</i> and <i>S.aureus</i> . Nebacetin versus rifampin were tested against <i>P.aeruginosa</i> and <i>E.coli</i> . Fifteen grafts (1cm <sup>2</sup> ) underwent 15min-antibiotic impregnation (5 grafts/antibiotic) and incubated at 37°C for 24h. Afterwards all grafts were removed and washed three times in phosphate-buffered saline to eliminate unbound bacteria. Viable adherent bacteria were released by sonification. Optical density of the solution prior to and after sonification was measured. Then, six 1:10 dilution steps of the solution were performed. 100µL of each dilution were plated onto TSB-agar plates and incubated overnight at 37°C and colony-forming units (CFUs) were visually identified and counted. Five grafts (one per antibiotic, one as positive and one as negative control) were observed under scanning electron microscopy (SEM) in order to assess the respective biofilms. Additionally, antibiotic toxicity against human umbilical cord vein-derived endothelial cells (EC) was determined by counting calcein-acetoxymethyl-ester-stained EC per microscopic field.
<b>Results</b>	Nebacetin showed comparable efficacy to daptomycin against gram-positive bacteria (table 1). Both antibiotics more efficiently eradicated <i>S. epidermidis</i> compared to rifampin, while all antibiotics showed similar antibacterial activity against <i>S. aureus</i> . Nebacetin was more efficient than rifampin to eradicate gram-negative organisms. The antimicrobial activity of each agent was demonstrated in SEM. Rifampin was highly toxic against endothelial cells (5.13±5.08 EC/field, P=0.0009), while daptomycin (30.88±5.44 EC/field, P=0.29) and nebacetin (28.50±3.82 EC/field, P=0.92) were not.
<b>Conclusions</b>	Nebacetin showed in vitro an excellent antibacterial activity, comparable to this of daptomycin, and covered efficiently gram-positive and -negative microorganisms. Thus, it could be an effective candidate for graft impregnation for the prevention of VGI. Rifampin was highly toxic against EC

**Preoperative Duplex Vein Mapping (DVM) Reduces Costs in Patients Undergoing Infrainguinal Bypass Surgery: Results of a Prospective Randomized Study.**

Linni K, Aspalter M, Mader N, Butturini E, Ugurluoğlu A, Granat S, Hitzl W, Hölzenbein T  
Department of Vascular and Endovascular Surgery, PMU Salzburg, Austria

**Introduction**  
**Aim of the study** Postoperative surgical site infections (SSI) after bypass surgery provoke major additional costs. The aim of our prospective randomized trial was to assess the impact of preoperative DVM on SSI development and costs generated thereby.

**Materials/Methods** Patients undergoing primary bypass were randomized to DVM of the greater saphenous vein (group A) or none (group B). Standard reporting guidelines were applied. Cost analysis was performed for theater, intermediate and intensive care, surgical ward, and outpatient department.

**Results** From 12/2009 to 4/2011, 130 patients were enrolled, 65 patients to each group. Both cohorts were equal regarding age, gender, risk factors, body mass index, bypass anatomy, distal run-off, operative time, incisional length, hospital stay, and bypass patency at 30 days, respectively. SSI were classified into minor (A: n = 13 vs B: n = 13, p = NS) and major (A: n = 1 vs B: n = 12, p<0.002). Preoperative DVM was the only significant factor to prevent major SSI (OR = 14.5 [95% CI: 1.8–115], p < 0.002). Readmissions for SSI: A = 3.1% vs B = 16.9% (p = 0.016). Reoperation costs due to SSI: A: (n=1), € 537 vs B (n=5), € 6553 (p=0.16). Additional intermediate (A: 0 days, B: 5 days) and intensive care (A: 0 hours, B: 48 hours); costs: A: € 0 vs B: € 8016 (p=0.22). Total days of readmission due to SSI: A: 14 vs B: 111 days, corresponding costs: A: € 2823 vs B: € 22386 (p=0.011). Frequency of outpatient visits due to SSI: A: 104 visits vs B: 213 visits (€ 6265 vs € 12831; p=0.67). Total costs of patients without SSI: ? 8177 vs major SSI: € 10963 (p<0.001).

**Conclusions** DVM significantly reduces postoperative major SSI and costs mainly generated by readmission, and should, therefore, be recommended as mandatory preoperative adjunct.

Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

Patients With Recurrent Ischaemic Event From Carotid Artery Disease Have A Large Lipid Core And Low GSM

1 Salem M, 2 Naylor R, 3 Sayers R, 4 Nicolaidis A, 5 Moore D, 6 West K, 7 Bown M  
1-3 & 5-7 - University of Leicester, 4 - Imperial College, London.

Introduction  
Aim of the study

Evidence suggests that in symptomatic patients with carotid artery stenosis there is a high risk of recurrent events during the first seven days. This has led the impetus towards fast track CEA. Our hypothesis is that patients who have recurrent events have altered plaque architecture. Thus, identification of specific ultrasonic (US) features in such patients supported by subsequent histology may provide a predictive tool for identifying patients at an even higher risk.

Materials/  
Methods

Between August 2008 and December 2010 consecutive symptomatic patients undergoing CEA in our unit were enrolled into the study after giving informed consent. Clinical details were recorded through face to face follow up. A recurrent event was any event leading to a neurological deficit after admission to the vascular unit. Plaque samples harvested at CEA were fixed in formalin and wax embedded and scored for markers of instability based on AHA grading by 2 independent histopathologists blinded to clinical features. B-mode duplex images were recorded prior to CEA and assessed by an independent person blinded to clinical details using the Iconsoft software. X2 was used to calculate the significance of association between recurrent and non-recurrent events and the presence of plaque histological and US features. In logistic regression a stepwise multivariate analysis was performed to identify independent associations between recurrent events, plaque histology and ultrasound features.

Results

158 patients were included in the study. The primary ischaemic event was stroke n=40 (25%); TIA n=92 (58%) and Amaurosis Fugax n=26 (16%). 20 patients had a recurrent event after admission to the vascular unit. In all cases the recurrent event was the same as the primary event stroke n=1 (5%); TIA n=16 (80%) and Amaurosis Fugax n=3 (15%). Plaques from patients with recurrent events were positively associated with a large lipid core on histology (p=0.018). On duplex imaging a low GSM (< 25) (hypochoic) and a large juxta-luminal black area (> 6mm sq) were positively associated with plaques in patients with recurrent events (p=0.003 and p=0.05 respectively). On multivariate stepwise analysis of all histological and US features, lipid core (OR 4.00, 95% CI 1.07 to 14.83, P=0.042), chronic plaque inflammation (OR 2.95, 95% CI 1.04 to 8.4, P=0.038) and low GSM (OR 6.21, 95% CI 1.86 to 20.4, P=0.003) were independently associated with plaques in patients with recurrent events.

Conclusions

Plaques from patients at risk of recurrent events have evidence of chronic plaque inflammation, a large lipid core and can be identified on pre-operative duplex imaging with a low GSM and a large JBA.

### Early Carotid Endarterectomy (CEA) is Associated with a Higher Adverse Event Rate. Data from symptomatic patients participating in the GALA Trial.

1 Dellagrammaticas D, 1 R Silvertown, 2 Lewis S, 1 MJ Gough, on behalf of the GALA Trial Collaborators  
1 Leeds Vascular Institute and 2 Edinburgh University, UK

<b>Introduction</b>	Data from the landmark trials (ECST, NASCET) of CEA and population natural history studies indicate a high risk of further neurological events and disabling stroke within two weeks of the presenting neurological symptom (PNS) in patients with symptomatic carotid stenoses. Thus current guidelines recommend early surgery. There is conflicting evidence on the safety of early surgery, which could carry an increased risk of stroke despite the conclusions of a recent systematic Cochrane Review. This has been re-assessed in 2164 symptomatic patients participating in the GALA Trial (general [GA] versus loco-regional [LA] anaesthesia for CEA).
<b>Aim of the study</b>	
<b>Materials/Methods</b>	30-day outcomes (stroke, death, MI) were analysed according to whether surgery was performed early (ES: $\leq 14$ days from PNS, $n=317$ ) or later (LS: $> 14$ days, $n=1847$ ). The influence of anaesthetic type, age, sex, PNS (ocular, transient ischaemic attack, stroke), and contralateral carotid occlusion were also examined.
<b>Results</b>	ES carried a higher risk of an adverse outcome (8.2% vs. 5.1%, OR 1.69, 95% CI 1.07 – 2.66, $p=0.025$ ) which was not influenced by the other factors examined by logistic regression analysis. Overall 18.4% of patients presenting with TIA and 16.5% with ocular symptoms had ES, compared to 10.1% of patients with stroke ( $p<0.005$ , chi-squared test). For ES the risk of an adverse outcome (GA versus LA) was 11.1% versus 7.6% in men ( $p=NS$ ) and 4.8% versus 4.7% in women ( $p=NS$ ).
<b>Conclusions</b>	These data confirm the need to improve the safety of early surgery if the benefit of CEA is to be maintained. This might be achieved by alternative surgical strategies (early ICA clamping) or pharmacological stabilisation of carotid plaques. Further studies are required to confirm the safety of ES and reporting the time from PNS to surgery should be mandatory in all CEA studies.

### Perioperative Outcome of Carotid Endarterectomy According with Type and Timing of Neurological Symptoms.

Faggioli GL, Pini R, Mauro R, Gargiulo M, Freyrie A, Gallinucci S, Stella A.  
Vascular Surgery, University of Bologna, Italy

<b>Introduction</b>	There is no agreement in the literature about the timing of carotid endarterectomy (CEA) in symptomatic patients. Aim of our work is to stratify outcome of CEA according to type and timing of neurological symptoms.
<b>Aim of the study</b>	
<b>Materials/Methods</b>	Consecutive patients submitted to CEA in a 5-year period were stratified in symptomatic (with CEA performed within 2 weeks, from 2 to 4 weeks and 4 to 24 weeks after symptoms occurrence) and asymptomatic (with either positive or negative cerebral CT scan) to evaluate the perioperative outcome in term of stroke, myocardial infarction (MI) and death. Results were compared by Chi square and ANOVA analysis.
<b>Results</b>	In the reviewed period 603 CEAs were performed with 10 (1.7%) strokes, 6 (1.0%) MI and 3 (0.5%) deaths. Symptomatic patients ( $n=136$ , 22.6%) were independently associated with higher incidence of stroke, MI, stroke/death and stroke/death/MI compared with asymptomatic ones (7 [5.1%] vs. 3 [0.7%] $p<0.002$ ; 2 [1.4%] vs. 4 [0.9%] $p<0.02$ ; 7 [4.3%] vs. 6 [1.3%] $p=0.02$ ; 11 [6.8%] vs. 8 [1.8%] $p=0.002$ , respectively). The timing of CEA in symptomatic patients and the type of preoperative symptoms (stroke or transient ischemic attack) were not associated with significant differences in outcome. The presence of preoperative positive cerebral CT scan was associated with a higher incidence of perioperative stroke in asymptomatic patients.
<b>Conclusions</b>	Although symptomatic patients have a higher risk of perioperative complications compared with asymptomatic ones, early CEA after symptoms onset does not influence the results and may be beneficial in protecting by further events. Clinically asymptomatic patients with positive CT have a similar complication potential of symptomatic ones.

### Alterations of Baroreflex Sensitivity After Carotid Endarterectomy According to the Preoperative Carotid Plaque Echogenicity.

1 Tsekouras N, 2 Katsargyris A, 3 Georgopoulos S, 3 Klonaris C, 3 Bakoyiannis C, 4 Bastounis E, 5 Tsekouras E, 6 Skrapari I, 3 Bastounis E

1 Attikon University Hospital, Department of Vascular Surgery, University of Athens; 2 Laiko General Hospital, Second Department of Propedeutic Surgery, Vascular Division, University of Athens Medical School;

3 Laiko General Hospital, First Surgical Department, Vascular Division, University of Athens Medical School;

4 Department of Bioengineering, UCSD (University of California San Diego);

5 Evangelismos General Hospital, Radiology Department, Athens;

6 Evangelismos General Hospital, First Department of Internal Medicine, University of Athens Medical School.

**Introduction**  
**Aim of the study** The baroreflex sensitivity seems to be lower in patients with echogenic carotid plaques compared to patients with echolucent ones. The purpose of our study was to compare the baroreflex function after carotid endarterectomy (CEA) between patients with different plaque echogenicity.

**Materials/**  
**Methods** Spontaneous baroreflex sensitivity (sBRS), heart rate (HR), systolic (SAP) and diastolic (DAP) arterial pressure were calculated in 51 patients with a severe carotid stenosis (70-99%), in 3 different moments in time: 24 hours before CEA, as well as 24 and 48 hours after CEA. Carotid plaque echogenicity was graded from 1 to 4 according to Gray-Waele classification, after duplex examination, and the patients were divided into 2 groups: the echolucent (grade 1 or 2) and the echogenic (grade 3 or 4).

**Results** The postoperative mean SAP values in all 51 patients at 24 and 48 hours (143.2 and 135.5 mmHg, respectively) were found to be significantly increased compared to the preoperative value (132.5 mmHg), ( $\chi^2= 32$ ,  $P< .001$ ). Mean sBRS value, in all patients, was significantly reduced postoperatively to 2.1 msec mmHg<sup>-1</sup>, from the mean preoperative value, 3.7 msec mmHg<sup>-1</sup>, independently to plaque echogenicity. Twenty patients (39%) were included in the echolucent group and 31 (61%) in the echogenic. The 2 groups had significant differences into two parameters: the rate of diabetes mellitus and the rate of symptomatic plaques. After adjusting the 2 groups for these differences we found that the preoperative difference in sBRS between the 2 groups [ $F(1, 51)= 11$ ,  $P< .003$ ] was eliminated 24 and 48 hours after CEA [ $F(1, 51)= .007$ ,  $P< .9$  and  $F(1, 51)= .4$ ,  $P< .5$  for T24 and T48 respectively].

**Conclusions** Our finding suggests that CEA induces a similar impairment of baroreflex function, unrelated to plaque echogenicity, enhancing the theory of intramural denervation during the procedure.

### Misinterpretation of the CREST Trial and Its Misleading Impact on the US AHA Guidelines.

F Veith

New York University Medical Center & The Cleveland Clinic, USA

#### Introduction Aim of the study

There have been many randomized controlled trials (RCTs) comparing carotid stenting (CAS) to carotid endarterectomy (CEA) in symptomatic patients with carotid stenosis (CS). One important recent trial is CREST (Carotid Revascularization Endarterectomy versus Stent Trial), which has been claimed to show equivalent outcomes for the 2 procedures and to justify CAS in low and moderate risk patients. This presentation will analyze the CREST's data and flaws and show how CREST has been misinterpreted to render it misleading.

#### Methods & Results

CREST was designed to compare CEA and CAS only in symptomatic patients. However inability to recruit adequate numbers of these forced the trialists to add asymptomatic patients with a different pathology and natural history, decreasing the power of some findings. The primary endpoint in CREST was a combination of death, stroke and myocardial infarction (MI). CAS and CEA treated patients had no significant difference in this combined end point up to 4 years (7.2% for CAS vs. 6.8% for CEA,  $p=0.51$ ). However, the incidence of total strokes (52 vs 29,  $p=.01$ ), major strokes (11 vs. 4,  $p=.09$ ), minor stroke (37 vs. 17,  $p=.01$ ), and death (9 vs. 4,  $p=.18$ ) was approximately 2X greater after CAS than after CEA. Some of these differences were not statistically significant because of the study's reduced power. Only when minor MIs (14 vs. 28,  $p=.03$ ) were included were the combined outcomes similar.

Other issues and flaws in CREST include: 1) Focus on the composite end-point – minor MIs are not the equivalent of even minor strokes and long-term disability was worse after strokes than MIs in CREST patients; 2) The CAS patients in CREST received more intensive antiplatelet treatment than the CEA patients – possibly accounting for the lower MI rate after CAS; 3) CAS operators in CREST were so good that they are not representative of CAS operators at large – so CREST results may not be representative of CAS throughout the US – this is supported by worse results in all population based studies and meta-analyses; 4) Although the higher incidence of stroke in CAS patients in CREST was similar to other recent randomized trials like ICSS, no evaluation of diffusion weighted MRI cerebral defects was performed in contrast to ICSS which revealed a much higher incidence of such defects (silent strokes) after CAS than CEA; 5) Recent improvements in CAS (like flow reversal and cessation) and improved patient selection were not employed in CREST. *continued*

continued ....

One conclusion of the recent AHA Guideline on carotid and vertebral artery disease was that CAS is an alternative to CEA for symptomatic CS. This conclusion was based largely on the CREST findings and ignored the ICSS results. This conclusion plus other findings of CREST are being widely misinterpreted to show the equivalence of CAS and CEA for both symptomatic and asymptomatic CS patients of standard or low risk. However, the AHA Guideline recognizes that the annual stroke risk of asymptomatic CS has fallen since 1985 from about 4-6% to <1% - probably due to statins and other improvements in medical treatment.

#### Conclusions

CREST was a well-designed and well conducted randomized trial that showed that both CEA and CAS could be performed with low adverse event rates. However, CREST has its flaws and is subject to misinterpretation. Because CAS causes more strokes than CEA, CAS is currently inferior to CEA and CAS should not be considered an alternative or equivalent to CEA in most symptomatic patients. CREST does not justify CAS or CEA for most asymptomatic CS patients, in most of whom medical treatment is probably a better alternative, although this must be proven by appropriate randomized trials.

### Chlamydia pneumoniae (Cp) Serology but not Aneurysm Wall Infection is Associated With the Enlargement Rate of Small Abdominal Aortic Aneurysms (SAAA)

Kaperonis EA, Varouhas A, Perrea D, Papavassiliou VG, Kakisis JD, Arvanitis D, Liapis CD

1. Dept of Vascular Surgery, Sismanogleio General Hospital, Athens, Greece 2. Dept of Vascular Surgery, Attikon Hospital, Athens Medical School, Athens, Greece

#### Introduction

Inflammation and infection are becoming more and more important in the pathophysiology of AAA. The aim of our study was to test the hypothesis that Cp serology as well as the presence of Cp in the aneurysm wall, are associated with the rate of AAA expansion.

#### Materials/ Methods

94 elective operations were performed in our Department in a 2-year period 2003-4, on patients that were at least one year on follow-up of a small AAA. We calculated in all patients the average annual rate of aneurysm expansion (size at intervention-size at original diagnosis in cm / time interval in years), and used it to separate them into two groups: the fast and the slow expanders (cut off limit 0.40 cm/y). Preoperatively, we measured in the serum, the levels of CRP, fibrinogen, TNF-, MMP-9 and antibodies IgA and IgG against Cp. The aneurysm wall content in TNF- and MMP-9, as well as the presence of the pathogen in the wall were determined.

#### Results

High average annual aneurysm expansion rate was significantly more common in smokers and patients with increased TNF-, MMP-9 and anti-Cp IgA antibodies serum levels. Faster expanding aneurysms, also had higher TNF- and MMP-9 wall concentrations and Cp was isolated much more frequently in aneurysm tissue. After multiple analysis, only smoking (p=0.023), anti-Cp IgA antibodies serum levels (p=0.011) and TNF- (p=0.034) and MMP-9 (p=0.008) aneurysm wall concentrations retained their statistical significance. Anti-Cp IgA positivity was much more common among the fast expanders, than in the slow expanders group (p=0.026).

#### Conclusions

Cp serology was correlated with a higher expansion rate, but Cp was not traced more often in the wall of faster enlarging aneurysms. Although TNF- and MMP-9 wall levels were higher in fast expanders, no serum inflammatory marker was associated with sac growth.

### Endovascular Repair of Abdominal Aortic Aneurysms (AAA) with Adverse Necks: Use of Standard Infra-Renal Devices (EVAR) Outside of the Manufacturers' Instructions for Use (IFU) is not a Safe Option.

Cross J, Harrison S, Simring D, Richards T, Ivancev K, Harris P  
University College Hospital, London, UK

<b>Introduction Aim of the study</b>	Purpose: Device manufacturers' guidelines on anatomical suitability for EVAR vary slightly but exclusion of AAAs with a neck length <15mm and angulation > 60% is standard. On this basis 40-50% of AAAs are unsuitable. Options for treatment of these patients include off-label use of an infra-renal device and increasingly fenestrated EVAR. We wished to assess outcome for EVAR outside 'instructions for use' (IFU).
<b>Materials/ Methods</b>	A large international EVAR registry database was interrogated. Patients undergoing infrarenal EVAR outside IFU (neck<15mm or anulation >60 degrees) were compared to those inside IFU. Primary endpoint was proximal type 1 endoleak. Secondary endpoints were all cause mortality, AAA related mortality, and secondary intervention.
<b>Results</b>	11208 patients were reviewed. 2839 were undertaken outside IFU(25.3%); 672 had neck length <15mm and 2356 angulation of > 60'. Patients were older(P=<0.001) and had more comorbidities in the outside IFU group. Mean aneurysm diameter was 57.8mm; mean diameter for short neck aneurysms was 59.9mm and 62.6mm for angulated necks(P=0.003). Overall 2.8% of patients developed a proximal type 1 endoleak. The incidence of endoleak rate was 5.3% in angulated necks, 7.6% in short necks and 12.7% in aneurysms with both short and angulated necks (P<0.001). All cause mortality (P<0.001) and aneurysm related mortality were higher in the outside IFU group (P=0.008). Time to reintervention was shorter in the outside IFU group (P=0.08).
<b>Conclusions</b>	Endovascular repair of abdominal aortic aneurysms outside manufacturer's instructions for use is associated with an unacceptable risk of proximal type 1 endoleak, aneurysm-related and all-cause mortality.

### AAA with a Challenging Neck: Early Outcomes using the Endurant Stent-graft System,

Setacci F, Slrignano P, de Donato G, Chisci E, Palasciano G, Cappelli A, Setacci C  
Vascular and Endovascular Surgery – University of Siena, Italy

<b>Introduction Aim of the study</b>	The efficacy and safety of EVAR in aneurysms in which a short, angulated, wide, conical, or thrombus-lined neck makes it difficult to achieve a reliable seal are disputed. We aimed to investigate the influence of a challenging neck on early results using the Endurant Stent-graft System.
<b>Materials/ Methods</b>	A case-control study was conducted on a prospectively compiled computerized database of 72 elective patients with challenging neck treated with the Endurant system; these patients were compared with a control-group (n=65) without significant neck problems. Endpoints were: early technical and clinical success, deployment accuracy and differences in operative details. Data are reported as mean and standard deviation (SD) or as absolute frequency and percentage (%). Normality distribution and homogeneity of variances were tested by Shapiro-Wilks and Levene tests, respectively. Inter-group comparisons for each variable were made by t-test or $\chi^2$ -test or Fisher exact test. A $p < 0.05$ was considered statistically significant.
<b>Results</b>	Mean age was 76.12 years; 76.6% were males. Risk factors and pre-operative variables did not differ significantly between the two groups. Mean neck length was 10.56 mm in patients with challenging anatomies and 22.85 mm in controls. Patients with a challenging neck differed significantly ( $p < 0.001$ ) from controls in terms of mean infrarenal ( $20.12^\circ$ vs $37.67^\circ$ ) and suprarenal angle ( $15.57^\circ$ vs $19.63^\circ$ ); 82% of patients with a challenging neck were ASA III/IV (vs. 86%). Technical success was 100%, with one unplanned proximal extension in each group. No type-I endoleaks or aneurysm-related deaths occurred in either group; major complications were 1.54% vs. 1.39% ( $p = 0.942$ ). Operative details were equivalent in both groups.
<b>Conclusions</b>	Treatment with the Endurant stentgraft is technically feasible and safe, yielding satisfactory results even in challenging anatomies. Medium- and long-term data are awaited to verify durability, but early results are promising.



**Prognostic Value of CD4+CD28- T-Cell Prevalence and Low-dose Aspirin for the Progression of Abdominal Aortic Aneurysms**

1 Frech A, 1 Mayer M, 2 Duftner C, 2 Dejaco C, 2 Schirmer M, 1 Fraedrich G, 1 Falkensammer J  
 1 Division of Vascular Surgery, Innsbruck Medical University, Austria. 2 Department of Internal Medicine, Innsbruck Medical University, Austria

**Introduction**  
**Aim of the study** While risk factors associated with development of abdominal aortic aneurysms (AAAs) are well defined, the actual processes leading to aneurysm progression and rupture are still under investigation. Our research is focused on immune mediated processes. CD4+CD28- T-cells are a subset of proinflammatory, cytotoxic T-cells that have been shown to be involved in AAA pathogenesis.

**Materials/Methods** 65 patients with aneurysms  $\leq$  55 mm from a prospective AAA-trial were included. Patients were followed up with either duplex sonography or CT-angiography. Prevalences of CD4+CD28- and CD8+CD28- T-cell subsets were determined using FACS analysis of peripheral blood samples at study inclusion. Due to the irregular distribution of T-cell subset concentrations, values were diverted into quartiles for further analysis. A diameter increase  $\geq$  3mm per year was considered significant. Associations of cardiovascular risk factors, medication and CD4+CD28- and CD8+CD28- levels with significant diameter increase were assessed using the Mann Whitney U Test. Independent risk factors were identified using multivariate logistic regression analysis (SPSS).

**Results** During the average follow-up of  $3.4 \pm 1.4$  years (range 0.3 – 5.7 years), a diameter increase of  $2.6 \pm 2.8$  mm/year (0 – 12.2 mm/year) was observed and the increase was significant in 19 cases. 4 patients were lost to follow-up. Multivariate analysis identified initial aneurysm diameter (OR = 1.4,  $p < 0.01$ ) as well as elevated concentrations of CD4+CD28- T-cells (OR=31.1,  $p < 0.05$ ) as independent risk factors of aneurysm progression while regular intake of low-dose aspirin showed a protective effect (OR = 0.061,  $p < 0.05$ ).

**Conclusions** Association of higher CD4+CD28- T-cell counts with significant diameter increase as well as the protective effect of low-dose aspirin in this study population support the role of inflammation in AAA development. The prognostic value of CD4+CD28- T-cell prevalence in AAA patients warrants further investigation.

### Arterial Stiffness is Associated with the Severity of Atherosclerosis and Serum Osteopontin Levels in Patients with Symptomatic Peripheral Arterial Disease.

Zagura M 1 and 2, Kals J 1, 2 and 3, Serg M 2 and 4; Kampus P 1, 2 and 4, Zilmer M 1 and 2, Jakobson M 5, Lieberg J 3 and 6, Eha J 2 and 4.

1 Department of Biochemistry, Centre of Excellence for Translational Medicine, University of Tartu; 2 Endothelial Centre, University of Tartu; 3 Department of Vascular Surgery, Tartu University Hospital; 4 Department of Cardiology, University of Tartu; 5 Department of Radiology, Tartu University Hospital; 6 Department of Surgery, University of Tartu, all Tartu, Estonia.

<b>Introduction Aim of the study</b>	Arterial stiffness is an independent predictor of vascular morbidity and mortality in the general population and in high-risk patients. Angiographic score is well-known parameter for measuring the extent of atherosclerosis in patients with peripheral arterial disease (PAD). Osteopontin (OPN) has recently emerged as a key factor in the pathogenesis of atherosclerosis. However, limited data exist on the relationship between arterial stiffness, severity grade of PAD and serum OPN levels. The aim of the present study was to evaluate the association between arterial stiffness, angiographic score and serum OPN in patients with symptomatic peripheral arterial disease.
<b>Materials/ Methods</b>	Seventy-nine male patients with symptomatic PAD (mean age 64±7 years) were included into this study. The diagnosis of PAD was confirmed by ankle-brachial pressure index (ABPI) and digital subtraction angiography. Calculation of the angiographic score was based on the severity and location of atherosclerotic lesions in the lower extremity arteries. Aortic pulse wave velocity (aPWV) and augmentation index (AIx) were evaluated by applanation tonometry using the Sphygmocor device. OPN level was determined by an enzyme-linked immunosorbent assay.
<b>Results</b>	The aPWV was significantly correlated with angiographic score ( $r=0.35$ , $p=0.003$ ), OPN ( $r=0.29$ , $p=0.002$ ), estimated glomerular filtration rate (eGFR) ( $r=-0.36$ , $p=0.002$ ) and log-hsCRP ( $r=0.24$ , $p=0.046$ ). In multivariate analysis, aPWV was independently associated with angiographic score, OPN, mean arterial pressure and eGFR ( $R^2=0.41$ , $p<0.0001$ ). Serum OPN was inversely correlated with ABPI ( $r=-0.3$ , $p=0.03$ ) but not with angiographic score.
<b>Conclusions</b>	In patients with symptomatic PAD, arterial stiffness is independently associated with the severity grade of atherosclerotic disease and serum OPN levels. These results suggest that aPWV might serve as a useful clinical marker of atherosclerosis in patients with PAD.

### The Beneficial Effects of a Direct Thrombin Inhibitor, Dabigatran, on the Development and Stability of Atherosclerotic Lesions in Apolipoprotein E-Deficient Mice.

Kadoglou NPE 1, Moustardas P 1, Katsimpoulas M 1, Kostomitsopoulos N 1, Schafer K 2, Kostakis A 1, Liapis CD 1  
1 Biomedical Research Foundation, Academy of Athens, Athens, Greece. 2 Georg August University of Goettingen, Goettingen, Germany

<b>Introduction Aim of the study</b>	Thrombin plays a central role in thrombus formation, platelet activation and inflammatory-related atherosclerosis development. Up to now, there are extremely limited data about the influence of thrombin inhibition on atherosclerosis. Aim of this study was to assess the effects of dabigatran, a direct thrombin inhibitor, on the development and stability of atherosclerotic lesions in apolipoprotein E-deficient (ApoE <sup>-/-</sup> ) mice.
<b>Materials/ Methods</b>	A total of 30 male ApoE <sup>-/-</sup> mice (12 weeks old) were randomized to the following groups: Atherosclerosis (ATH, n=15): Fed high-fat diet (western-type); Atherosclerosis plus dabigatran (ATH+DAB, n=15): Received high-fat diet and concomitantly dabigatran (10 mg dabigatran /g chow). After 12 weeks, the common carotid artery of all ApoE <sup>-/-</sup> mice was subjected to injury by ferric chloride, and the time to thrombotic occlusion (TTO) was measured. Then, mice were euthanized and the aortic arch of each mouse was excised to determine the mean area of atherosclerotic lesions, and the content of macrophages, elastin, collagen, nuclear factor kappaB (NF $\kappa$ B), matrix metalloproteinase-9 (MMP-9) and its inhibitor (TIMP-1). Student's t-test was used for statistical purposes ( $p<0.05$ ).
<b>Results</b>	We observed significantly longer TTO in ATH+DAB group compared to ATH group ( $8.9\pm 2.3$ min vs $3.5\pm 1.1$ min, $p<0.001$ ). Morphometric analysis revealed reduced mean plaque area in ATH+DAB group versus ATH group ( $p<0.001$ ). Moreover, dabigatran treatment seemed to promote plaque stability by increasing collagen ( $p<0.05$ ) and elastin ( $p<0.05$ ) contents. Notably, immunohistochemistry analysis demonstrated reduced positive-stained area for NF $\kappa$ B, macrophages and MMP-9 and increased for TIMP-1 ( $p<0.05$ ) in atherosclerotic lesions derived from dabigatran-treated mice compared to untreated mice.
<b>Conclusions</b>	Our findings suggest that the direct thrombin inhibitor dabigatran attenuates arterial thrombosis, reduces lesion size and may promote plaque stability in ApoE <sup>-/-</sup> mice. Possibly, the latter effect is mediated by favourable modification of proinflammatory factors and MMP-9/TIMP-1 balance.

Grant by the Alexander S. Onassis Public Benefit Foundation.

### Correlations Between Clinical Variables and Gene Expression Profiles in Carotid Plaque Instability.

Razuvaev A, Ekstrand J, Folkersen L, Agardh H, Markus D, Swedenborg J, Göran K Hansson, Gabrielsen A, Paulsson-Berne G, Roy J, Hedin U

Karolinska Institutet and Karolinska University Hospital, Stockholm Sweden

**Introduction**  
**Aim of the study** Stroke is a leading cause of death and functional impairment in the Western world. A significant part of strokes are caused by embolism from unstable carotid plaques characterized by inflammation and tissue degradation.

The aim of this study was to validate a biobank of human carotid endarterectomies as a platform for further exploration of pathways for plaque instability. For this purpose, we investigated the relationship between clinical parameters of plaque instability and expression of genes previously shown to be associated with either plaque instability or healing processes in the vessel wall.

**Materials/Methods** A database of clinical information and gene expression microarray data from 106 carotid endarterectomies was used.

**Results** Genes associated with inflammation were overexpressed in symptomatic plaques compared with asymptomatic ones. Plaques obtained from patients undergoing surgery within 2 weeks after embolic event showed up-regulation of genes involved in healing reactions in the vessel wall. Treatment with statins as well as echodense lesions were associated with more stable phenotype.

**Conclusions** In this study we demonstrate that gene expression profiles correlate to clinical parameters. Our results show that microarray technology and described clinical variables can be used for the future identification of central molecular pathways in human plaque instability.

### Correlation of Biomechanics and Inflammatory Tissue Reaction in Abdominal Aortic ±Aneurysm (AAA) Assessed by Computational Finite Element Analysis and FDG-PET-CT

Reeps C, Maier A, Gee MW, Baust M, Zimmermann A, Ockert S, Pongratz J, Wall WA, Essler M, Eckstein HH

Technische Universität München, Germany

**Introduction**  
**Aim of the study** Mechanobiological interactions in abdominal aortic aneurysm (AAA) wall are postulated but so far were difficult to demonstrate in vivo. However, inflammatory metabolic activity of AAA wall now can be scrutinized by 18F-fluorodeoxyglucose positron emission tomography CT (FDG-PET/CT) and biomechanical forces can be calculated precisely by finite element analyses (FEA). This study was designed therefore to correlate the findings of FDG-PET-CT and FEA simulation in patients with non-ruptured AAA.

**Materials/Methods** FDG-PET/CT data sets of 18 non-ruptured AAA (14 men, mean diameter 56mm (45-75) were studied, maximum standard uptake values (SUVmax) were obtained and FDG metabolism of AAA wall was visualized 3 dimensionally. Advanced finite deformation FEA was performed to quantify peak wall stresses (PWS), strains and their distributions. Peak stress and strain and their spatial distributions were correlated to the corresponding FDG-uptake in AAA wall.

**Results** SUVmax varied from 1.3-4.6 (average SUVmax  $3.3 \pm 0.9$ ) and average PWS and strains were  $38.2 \text{ N/cm}^2 \pm 13.7 \text{ N/cm}^2$  (range: 10.0-64.0  $\text{N/cm}^2$ ) and  $0.22 \pm 0.02$  (range: 0.19-0.26), respectively. Quantity of SUVmax was significantly correlated to PWS and maximum strain (SUVmax vs. PWS:  $R^2 = 0.60$ ,  $p = 0.008$ ; SUVmax vs. maximum strain:  $R^2 = 0.66$ ,  $p = 0.004$ ). In all but 3 AAA, areas with increased FDG-uptake showed well and visible spatial correlation to areas with increased stresses and strains while areas with low stress and strain showed negligible FDG-uptake. Spatial overlap varied from 41% to 78% (average  $56.3\% \pm 11$ ) without consideration of qualitative similarities as shape.

**Conclusions** The strong quantitative and spatial correlation of increased wall stress with increased FDG uptakes strongly supports experimental hypotheses of mechanotransduction mechanisms in AAA. Potentially, these results may help to study mechano-biological interactions in vivo with implications for non-invasive rupture risk evaluation of AAA.



## Notes

### Aortic Aneurysm Repair Using an Endoprosthesis Designed to Eliminate Endoleaks: Single Center Experience.

Krievins D 1, Kisis K 1, Savlovskis J 1, Gedins M 1, Zarins K 2

1 Pauls Stradins Clinical University Hospital, Riga, Latvia. 2 Stanford University Medical Center, Palo Alto, USA

46.

<b>Introduction</b>	Endoleaks adversely affect the short and long-term results of EVAR.
<b>Aim of the study</b>	We reviewed our experience with a unique endoprosthesis which is designed to eliminate endoleaks by filling the aneurysm sac with a quick-setting polymer which is contained in an endobag which surrounds the endoprosthesis. The filled endobags obliterate the aneurysm sac while providing support and stability to the flow lumens.
<b>Materials/Methods</b>	All patients enrolled in our center in an IRB-approved prospective clinical trial of the Nellix endograft were reviewed. Pre and post-op CT scan, procedural results, clinical outcome and follow-up CT scans at 1, 6, 12 and 24 months were reviewed.
<b>Results</b>	From 2008–2011, 21 patients, aged $62\pm 8$ years, with AAA diameter $5.8\pm 0.7$ cm were enrolled and treated. Aortic neck length was $21\pm 11$ mm with neck length $< 9$ mm in 7 patients (33%); neck angle was $> 60$ degrees in 4 (19%) and iliac aneurysms $> 20$ mm were present in 5 (24%) cases. Complete AAA exclusion was achieved in all by filling endobags with 39 ml polymer (11–130ml). Sac-filling iliac extenders were used to treat 6 common iliac (CI) aneurysms with preservation of hypogastric patency in all. Procedural success was 100%; 30day mortality and morbidity was 0%. During a mean follow-up of 10 months (1–24 mo), there have been no aneurysm related deaths, no device-related adverse events and no secondary procedures. One patient died of CHF at 10 months; one patient had acute MI at 5 months and underwent PTCA. One patient had enlargement of an untreated CI aneurysm and was treated with an iliac extender at 2 years, Follow up CTs demonstrate patent endograft lumens, no device migration, no aneurysm enlargement and no new endoleaks. One patient had a transient, limited-space endoleak at 30 days which was absent at 60 days, 6, 12 and 24 months. There have been no other endoleaks.
<b>Conclusions</b>	This novel sac-filling endoprosthesis was successful in eliminating endoleaks following endovascular aneurysm repair. Early results in treating patients with favorable as well as adverse neck and iliac anatomy is promising. This new device appears to eliminate endoleaks and reduce the need for secondary procedures. It may thus improve the long-term durability of endovascular repair. Further studies with a longer follow-up are needed.

655

### Use of Chimney Grafts for Endovascular Repair of Juxtarenal Aortic Aneurysms is Still Safe after 24 Months' Follow Up

Donas KP, Eisenack M, Panuccio G, Austermann M, Torsello G  
St. Franziskus Hospital Münster, Germany

**Introduction**  
**Aim of the study** To present our midterm experience with the use of chimney grafts in endovascular aneurysm repair (EVAR) of juxtarenal abdominal aortic aneurysms (JAAAs).

**Materials/Methods** Among 90 patients with JAAA treated at our Institution between November 2008 and December 2010, 30 high-risk patients (all men; mean age 74.5, range 60–88) underwent EVAR with synchronous placement of chimney grafts. Sixteen of them (53.3%) had a mean follow up of 24 months. The chimney technique consists of placing covered stents parallel to the main aortic stent-graft to preserve or rescue flow to aortic branch vessels while extending the proximal fixation zone. All patients presented with JAAAs had short or absent neck (0–9 mm) for conventional EVAR. Differences in renal function were calculated using the nonparametric Kruskal–Wallis and exact Wilcoxon scores tests.

**Results** The immediate technical success of the chimney technique was 100%. Thirty-five renal (n:35) and 3 visceral arteries were revascularized in all cases by balloon-expandable covered stents. The 30-day patency of the target vessels was 100%, 6-month patency rate was 97.7%. One renal artery was occluded 45 days postoperatively. The patient underwent open conversion, removal of the occluded chimney graft and implantation of an 8 mm Dacron iliorenal bypass. The creatinine value at discharge was 1.6 mg/dl. No patient suffered from persistent postoperative renal insufficiency and dialysis. Midterm evaluation of renal function showed no significant declines in the overall creatinine value (1.41±1.05 mg/dl vs 1.3±1.00 mg/dl, p .270) and overall mean estimated glomerular filtration rate (62.93±18.6 vs 67.23±23.87 ml/min/1.73m<sup>2</sup>, p. 574). All aneurysms were successfully excluded; two type II endoleaks were recorded and treated conservatively with radiological surveillance. No type I or III endoleaks were detected; no aneurysm-related death was noted.

**Conclusions** The presented report of the largest series in the literature demonstrates that use of chimney grafts for endovascular repair of JAAA in selected high risk patients is still safe after 24 months follow up.

### Laparoscopic Versus Open Approach for Aortobifemoral Bypass for Severe Aorto-iliac Occlusive Disease.

Tiek J 1, Remy P 2, Sabbe T 1, D'hont CH 2, Daenens K 1, Houthoofd S 1, Fournau I 1  
1 Department of Vascular Surgery, UZ Leuven, Leuven, Belgium. 2 Department of Vascular Surgery, Hôpital St.Joseph, Gilly, Belgium

**Introduction**  
**Aim of the study** A multicentre randomised controlled trial was designed to investigate possible differences between conventional open and laparoscopic aortobifemoral bypass surgery for aorto-iliac occlusive disease on postoperative morbidity and recovery.

**Materials/Methods** Between January 2007 and November 2009, 28 patients with severe aorto-iliac occlusive disease (TASC C or D) were randomized between a laparoscopic and conventional open approach for aortobifemoral bypass surgery at one community hospital and one university hospital. Demographic data, operative data and postoperative recovery data were recorded for both groups.

**Results** The operation time was on average longer for the laparoscopic approach than for the open approach (mean 4h30 (2h20 – 6h20) versus 3h30 (1h42 – 5h11)). Nevertheless, postoperative recovery and in-hospital stay were significantly shorter after laparoscopic surgery. Oral intake could be restarted earlier: fluid diet was on average resumed after 20h34 (3h05 – 26h55) after laparoscopy versus 43h43 (19h36 – 77h30) after open surgery. Solid diet was resumed after 27h32 (19h36 – 41h30) and 69h06 (42h40 – 111h55) respectively. Postoperative mobilisation (walking) started earlier after laparoscopy (mean 46h15 (16h07 – 112h40) versus mean 94h14 (66h10 – 127h23)). Length of hospitalisation was shorter (mean 5,5 days (2,5 – 15 days) versus mean 13.0 days (7 – 45 days)). Visual pain scores and visual discomfort scores were both lower after laparoscopic surgery (Figures). Return to normal daily activities was achieved earlier: 53,9% after 2 weeks in the laparoscopy group versus 0,0% in the open surgery group; after 4 weeks this was 100% and 36,4% respectively. There were no major complications in both groups. Minor complications as wound problems or pneumonia were encountered after conventional open aortobifemoral bypass surgery only.

Due to these promising results in favor of the laparoscopic approach, further inclusion of patients in the study was stopped prematurely.

**Conclusions** Laparoscopic aortobifemoral bypass surgery for aorto-iliac occlusive disease is a safe procedure with an important decrease in postoperative morbidity and in-hospital stay and earlier recovery.

### Total Laparoscopic Versus Conventional Abdominal Aortic Repair for Occlusive and Aneurysmal Disease. A Risky Innovation.

Ricco JB, Valagier A, Cau J, Page O, Marchand C, Régnault G

Department of Vascular Surgery, Hospital Jean Bernard, University of Poitiers, 86000, France

<b>Introduction Aim of the study</b>	This study was designed to compare the per- and postoperative outcomes of total laparoscopic repair and open surgical repair for infra-renal abdominal aortic aneurysms (AAA) and aortoiliac occlusive disease.
<b>Materials/ Methods</b>	From January 2006 to December 2009, 139 patients with an AAA and 89 patients with a TASC D aortoiliac occlusive disease received whether a totally laparoscopic aortic bypass using a transperitoneal left retro-colic approach or a conventional bypass. These groups were matched in a case-control fashion by risk factors and ASA classification. Univariate and logistic regression analysis were used to assess the impact of a number of factors on the likelihood of intraoperative complications.
<b>Results</b>	The open and laparoscopic groups had comparable general risk factors. Median operative time and median clamping time were significantly longer in the laparoscopic group but only for AAA. Median total blood loss was comparable in both groups. In the laparoscopic group, conversion to open surgery was needed in 30% of the patients with AAA and in 13.2% of patients with occlusive disease. Reoperation within 30-day was significantly more frequent in the laparoscopic group than in the open group, 13.3% vs. 3% for AAA and 16.9% vs. 8.3% for occlusive disease, ( $p = 0.04$ ). Postoperative surgical complications including graft thrombosis were also more frequent in the laparoscopic group than in the open group, 23% vs. 6.8% for AAA and 9% vs. 1% for occlusive disease, ( $p = 0.01$ ). The mortality rate was not significantly different between the two groups. Median duration of nasogastric aspiration and median duration of hospital stay were significantly lower in the Laparoscopic group. Logistic regression showed that Laparoscopic approach was the strongest predictor of complications and death with an odds ratio of 5.6 for patients with an AAA [95% CI, 1.6 to 19.4, $p = 0.006$ ].
<b>Conclusions</b>	This study demonstrates that laparoscopic aortic surgery for TASC D occlusive disease and for AAA carries no advantage when compared to open surgery. Laparoscopic surgery for AAA was even more risky even in the hands of well trained laparoscopic vascular surgeons.

### No Differences in Peri-operative Outcome between Symptomatic and A-symptomatic AAA's after EVAR: An Analysis from the ENGAGE Registry.

Stokmans RA 1, Teijink JAW 1, Cuypers PWM 1, Riambau VA 2

1 Department of Vascular Surgery, Catharina Hospital, Eindhoven, The Netherlands. 2 Vascular Surgery Division, Thorax Institute, Hospital Clinic, University of Barcelona, Spain

<b>Introduction Aim of the study</b>	Historic cohorts show that patients with symptomatic abdominal aneurysms (S-AAA) have worse peri-operative outcomes after open repair when compared to elective non-symptomatic AAA patients (E-AAA). Data from the ENGAGE registry were used for analysis.
<b>Materials/ Methods</b>	Between March 2009 and December 2010, 1200 consecutive AAA patients treated with an Endurant endograft from 77 sites in 30 countries worldwide, were prospectively registered in the ENGAGE database. S-AAA defined as an AAA accompanied by abdominal or back pain or tenderness, but without rupture, was present in 185 (15%) patients. The S-AAA patients were compared to 1014 (85%) E-AAA patients. Differences in baseline characteristics and perioperative outcome variables were analysed using chi-square test for discrete variables and ANOVA for continuous variables. Multivariate logistic regression analysis was performed to adjust for possible confounding factors.
<b>Results</b>	No relevant differences between both groups on age, sex and maximum AAA diameter existed at baseline, but E-AAA patients scored higher ASA class more often ( $P=0.001$ ). Further analysis were corrected for ASA classification. Progress of the EVAR procedure was similar in both groups with regards to operation time and technical success, and S-AAA patients were admitted to the ICU as often as E-AAA patients (33.3% in S-AAA vs. 35.7% in E-AAA, with $P=0.479$ ). Hospital stay was comparable with S-AAA ( $7.3 \pm 5.7$ days) and E-AAA ( $6.6 \pm 4.9$ days) ( $P=0.946$ ). No differences in the occurrence of major adverse events (MAE), including mortality, within 30-days post-implantation were seen between S-AAA and E-AAA patients, respectively 4.4% and 3.2% ( $P=0.540$ ).
<b>Conclusions</b>	Endovascular AAA repair is a dynamic endeavour; new devices and perioperative care have improved and operators have become more proficient resulting in less perioperative burden in patients. The contemporary ENGAGE data indicate that there is no negative effect of the more acute procedural progress of symptomatic AAA patients.

### Determinants of AAA Sac Shrinkage after EVAR – Results from the ENGAGE Registry.

Böckler D, Fitridge R, Wolf Y, Hayes P, Silveira PG, Numan F, Riambau V; for the ENGAGE Investigators  
University of Heidelberg, Germany

<b>Introduction Aim of the study</b>	To determine covariates influencing abdominal aortic aneurysm sac shrinkage (AAA-SS) after endovascular AAA repair (EVAR)
<b>Materials/ Methods</b>	Data on 975 out of 1200 patients were retrieved from the Endurant Stent Graft Natural Selection Global Postmarket Registry (ENGAGE), 88.2 % having AAA size > 50 mm and proximal neck length less 15 mm in 18.2 % (mean 27.8 mm). 92.1 % were asymptomatic elderly males with considerable comorbidities in 47.3%. Endoleakage (EL) rate was 0.8%, 0.2% and 0% for Type I, III and IV respectively. AAA-SS was defined as AAA size decreased by 5 mm compared to diameter at index procedure. Time intervall from index procedure to first assessment of AAA-SS on CT scan was documented in months. Demographic and procedural covariates were evaluated performing multivariable cox proportional hazards analysis (HR, 95% CI). Mean follow-up is 4.8 (0.1-20) months.
<b>Results</b>	Mean duration from index procedure to first assessment of AAA-SS was 5.7+/-5.2 months (range 0.1-20). AAA diameter, common iliac diameter, and presence of EL are significant factors (<0.001 for all) influencing AAA-SS. Patients with larger AAA diameter (>55mm) have higher chance (49%, HR 1.49) to achieve AAA-SS compared to smaller AAAs. Patient with both common iliac artery > 20 mm have higher chance to achieve AAA-SS (HR 3.0). EL Type I and II are associated with AAA-SS (p 0.028 and 0.004). EL type I was associated with sac enlargement (p 0.031, OR 3.3). Patients with EL type II was 20% less likely to have AAA-SS. Age (p 0.23), gender (p 0.67). aortic neck - length (p 0.74), -diameter (p 0.90), and - angle (p 0.80) showed not to have significant influence on AAA-SS.
<b>Conclusions</b>	Interim results of ENGAGE determine AAA size, diameter of iliac arteries and endoleakage to be independent influencing factors of AAA-SS after EVAR. Longer follow-up are needed to confirm these observations.

### Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

## Notes

### Cost and Effectiveness of Laser with Phlebectomies Versus Foam Sclerotherapy in Superficial Venous Insufficiency. Early Results of a Randomised Controlled Trial.

Lattimer CR 1, Azzam M 1, Shawish E 1, Kalodiki E 1, Trueman P 2, Geroulakos G 1

1 Josef Pflug Vascular Unit, Ealing Hospital & Imperial College, London, UK. 2 Health Economics Research Group, Brunel University, Middlesex, UK

<b>Introduction Aim of the study</b>	It has been suggested that Endo-Venous Laser Therapy (EVL) is more effective than Ultrasound Guided Foam Sclerotherapy (UGFS) but this has never been confirmed through a randomised trial. The aim of this study was to quantify both treatments in terms of cost and effectiveness using duplex, functional, clinical and haemodynamic measurements at 3 weeks and 3 months.
<b>Materials/ Methods</b>	One hundred patients (100 legs), C2-6, age 21-78, M:F 42:58, averaged refluxing great saphenous vein (GSV) diameter 7mm (range 4-12), were randomised into local anaesthetic EVLT or UGFS. Assessments were at baseline, 3 weeks and 3 months using duplex, the Aberdeen Varicose Vein Questionnaire (AVVQ), the Venous Clinical Severity Score (VCSS) and the Venous Filling Index (VFI) in ml/sec with air-plethysmography. Improvements were calculated by subtracting the current scores from the scores at baseline. Duplex success was defined as above knee (AK) GSV occlusion (any length) but without AK GSV reflux. Two additional treatments with UGFS were allowed, according to the patient's informed preferences, and regardless of cost. Microcosting, using individually timed treatments, was based on consumables, staff pay rates, location and overheads.
<b>Results</b>	Improvements in duplex, functional, clinical and haemodynamic values demonstrated no significant difference between the two treatments. EVLT performed 12% better at 3 weeks and 5% better at 3 months in AK GSV occlusion. However, there were significant differences in favour of UGFS in cost, treatment duration, averaged 7 day post-procedural pain scores and time to return to normal activities.
<b>Conclusions</b>	UGFS is 4.2 times cheaper than EVLT on the background of comparable effectiveness but 56% (versus 6%) of patient's required additional treatment. This potential cost saving cannot be ignored in public health-care systems.

### Identification of Distinctive Metabolic Signature of Varicose Veins by Nuclear Magnetic Resonance Spectroscopy – A Novel Research Area for understanding the pathogenesis of Varicose Veins Disease.

Anwar MA 1, Beckonert O 2, Shalhoub J 1, Vorkas P 2, Lim CS 1, Want EJ 2, Holmes E 2, Davies AH 1

1 Academic Section of Vascular Surgery. 2 Section of Biomolecular Medicine, Department of Surgery and Cancer, Imperial College London, UK

<b>Introduction</b>	Varicose veins affect one third of adults in the western world.
<b>Aim of the study</b>	Morphological, transcriptional and protein-level differences have been demonstrated between varicose and non-varicose veins. Metabonomics analysis employing Nuclear Magnetic Resonance (NMR) spectroscopy is established for metabolic profiling of tissues or biofluids and has been used in the identification of drug toxicity, any changes in enzymes or genes expression and disease biomarkers. This pilot study aims to compare the metabolic profile of varicose and non-varicose vein tissue.
<b>Materials/ Methods</b>	Vein tissue was obtained from patients undergoing surgery for varicose veins (n=7). Non-varicose controls were great saphenous veins retrieved from patients underwent leg amputation (n=3) and peripheral arterial bypass surgery (n=4). Intact tissue samples from each vein segment (average weight of 10.33 +/- 0.8 grams) were subjected to high-resolution Magic Angle Spinning (MAS) NMR spectroscopic analysis. At 600 MHz, 1D 1H-NMR spectra with water-presaturation were acquired. Following pre-processing, chemometric analysis of the spectral data was performed using SIMCA-P+ and in-house software tools written in MATLAB.
<b>Results</b>	Orthogonal partial least square regression analysis (OPLS) of spectra showed clustering of varicose vein samples, with separation between the varicose and non-varicose vein groups in the predictive component. This difference between the groups was statistically significant with the p value of < 0.01. Detailed visualisation of spectra using MATLAB revealed several metabolic changes in varicose vein group including a significantly differential expression of nitrogenous organic acid creatine.
<b>Conclusions</b>	This preliminary study demonstrates a differential metabolic profile in varicose as compared with non-varicose veins. Elucidating the metabolic signature underlying varicose veins has the potential to further our understanding of disease pathogenesis, identify putative biomarkers and targets for prevention and treatment.

### Superficial Vein Thrombosis in Patients with Varicose Veins: Role of Thrombophilia Factors, Age and Body Mass.

Karathanos C 1, Sfyroeras G 1, Drakou K 1, Roussas N 1, Exarchou M 1, Kyriakou D 2, Giannoukas A 1

1 Department of Vascular Surgery, University Hospital of Larissa, University of Thessalia, Larissa, Greece.

2 Department of Haematology Laboratory, University Hospital of Larissa, University of Thessalia, Larissa, Greece

<b>Introduction</b>	The aim of this study was to evaluate the prevalence of Protein C (PC), Protein S (PS) and Antithrombin III (AT III) deficiency in patients with varicose veins and episodes of superficial thrombophlebitis (STP).
<b>Aim of the study</b>	
<b>Materials/ Methods</b>	Two hundred and thirty patients with primary varicose veins (VVs) presented to our vascular laboratory and had a coagulation profile performed that included PC, PS and AT III. 128 patients (85 women and 43 men, mean age 56.16 SD 13.76) had an acute episode or a previous history of STP while 102 patients did not have STP (75 women and 27 men, mean age 48.67 SD 12.55). The coagulation profile performed was assessed after three months from the STP episode or anticoagulation therapy to ensure that the results of hypercoagulability were not affected of any other factor. Body mass index (BMI) also was examined.
<b>Results</b>	PC was present in 3/125 (2.3%), PS in 19/128 (14.8%) and Antithrombin III 29/128 (22.7%) in STP patients and 0/102, 3/102 (2.9%) and 15/102 (14.7%) in the control group, respectively. In addition, BMI > 30 kg/m <sup>2</sup> was associated with STP. In multiple regression analysis comparing patients and control groups which only significant factors were included, STP was associated with PS (OR 6.7, p=0.004, 95% CI 1.84-24.43), obesity (OR 3.2, p= 0.005, 95% CI 1.41- 7.19) and age (OR 1.037, p= 0.001, 95% CI 1, 04-1.06).
<b>Conclusions</b>	The prevalence of PC, PS and Antithrombin III was higher in patients with STP but only PS was statistically significant. Obesity, age and PS seem to be associated with STP in patients with varicose veins.

### STD Foam is Less Stable but More Active than Polidocanol.

McAree B, Ikponmwosa A, Brockbank K, Abbott C, Homer-Vanniasinkam S, Gough MJ

Leeds Vascular Institute, The General Infirmary at Leeds & Institute of Pharmaceutical Innovation, University of Bradford, UK

**Introduction**  
**Aim of the study** Minimal data is available regarding the half-life of sclerosant foams and the damage that they inflict upon the vein wall.

**Materials/**  
**Methods** 3% STD (Sodium tetradecyl sulphate) and 3% polidocanol foams were produced using the Tessari technique. Foam was transferred to a preheated (37 °C) 15 ml graduated polyester tube. Initial foam volume was recorded and subsequent readings taken every 30 seconds. The time taken for the foam volume to reduce by 10% (T90) and 50% (T50) was recorded. 10 measurements were conducted for each.

3–5cm segments of proximal great saphenous vein (GSV) harvested during sapheno-femoral ligation were filled with foam for 5 or 15 minutes (5 segments for each foam for each time). Subsequently the segments were rinsed with heparinised blood fixed in formaldehyde, sectioned and stained with haemotoxylin and eosin. Histological analysis was performed by a "blinded" consultant pathologist. 20x magnification sections were analysed via Aperio ImageScope to determine % luminal endothelial loss and the depth of injury to the media.

**Results** The median T90 and T50 for polidocanol were 123.30s (IQR 111.7–165.6) and 266.3s (IQR 245.6–383.1) versus 102.0s (IQR 91.1–112) and 213.1s (IQR 201–231.6) for STD (T90 p=0.001, T50 p=0.0002; Mann-Whitney U Test).

Mean endothelial loss after exposure to polidocanol was 62.4% and 84.81% compared with 89.4% and 97.7% for STD after 5 and 15min (p=0.095 and p=0.0079) respectively. Mean depth of media injury (and % of media thickness injured) for polidocanol was 3.34nm (0.23%) and 1.31nm (0.14%) versus 51.1nm (4.56%) and 50.6nm (5.07%) for STD after 5 and 15min respectively. (Mean depth of injury STD vs. polidocanol, 5 and 15 minutes (p= 0.0097, Mann-Whitney U Test); % media thickness injury, 5 and 15 minutes; p=0.0097, Mann-Whitney U Test).

**Conclusions** Although polidocanol foam shows greater stability than STD foam and may thus remain in the treated segment of vein for longer (in vivo), damage to the media is significantly greater with STD.

### Risk factors for Non-Recanalization after Anticoagulation Therapy in Patients with Isolated Calf Vein Thrombosis

Park YJ, Park KB 1, Kim DI, Do YS 1, Kim DK 2, Kim YW

Vascular Surgery, 1Radiology, 2 Cardiology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

**Introduction**  
**Aim of the study** Calf vein thrombosis (CVT) is comprised of muscular and deep CVT. For the treatment of CVT, 2008 ACCP guideline recommended 3 months of oral anticoagulation. However, it is still in debate regarding optimal duration of anticoagulation and it has not been well known which factors are related with non-recanalization after anticoagulation therapy. The purpose of this study is to observe the recanalization rates at 1 and 3 months after warfarin therapy and to determine the risk factors related with non-recanalization of CVT.

**Materials/**  
**Methods** For the last 3 years, 150 limbs in 110 patients (Male : Female = 23:87, mean age 63.4) with CVT were enrolled in a single center. Those patients were periodically examined with duplex ultrasonography to see recanalization of the CVT. Patients having prior history of deep vein thrombosis (DVT) or thrombophilia were excluded from this study.

We calculated the recanalization rates at 1 and 3 months after warfarin therapy (target INR of prothrombin time, 2–3) and analyzed risk factors related with non-recanalization of CVT by entering clinical and lesion characteristics, risk factors of CVT.

**Results** CVT were distributed in muscular calf vein in 110 (73.3%), deep calf vein in 18(12%), and in both 22 (14.7%). Among all CVT, 94 limbs (63%) were symptomatic. The risk factors of venous thrombosis were orthopaedic surgery (87.3%), malignant tumor (21.3%) and immobilization (15.3%). Pharmacological DVT prophylaxis was performed only in 25% of patients. 116 limb (77.3%) were treated with anticoagulation while 34 limbs were treated by conservative method including elastic compression stocking and ambulation. By means of duplex ultrasonography, cumulative recanalization rate at 1 and 3 months was ==% and 82%, respectively. Recanalization rate in patients who underwent warfarin therapy (n=116 limbs) was 84% and 65% in patients who did not undergo anticoagulation therapy (n=34 limbs, p=0.008). In multivariate analysis, malignant tumor (p=0.043, OR 2.789) and immobilization (p=0.020, OR 4.191) were risk factors for non-recanalization of CVT.

**Conclusions** For patients with isolated CVT, no anticoagulation or 1 month duration of anticoagulation resulted in higher rates of non-recanalization compared to 3 month anticoagulation. Immobilization and malignant tumor were independent risk factors for non-recanalization.

**Generic Health-Related Quality Of Life Is Significantly Worse In Varicose Vein Patients With Lower Limb Symptoms Independent Of CEAP Clinical Grade.**

Darvall KAL, Bate GR, Adam DJ, Bradbury AW  
University of Birmingham Department of Vascular Surgery, UK

**Introduction** The presence of lower limb symptoms has been previously shown to be poorly associated with severity of venous disease as determined by CEAP clinical grade and also the degree of superficial venous reflux on duplex ultrasound.

**Aim of the study** The aim of this study is to determine the relationship between lower limb symptoms and generic health-related quality of life (HRQL) in patients with varicose veins (VV).

**Materials/ Methods** 284 patients on the waiting list for VV treatment completed the Short Form-12 (SF12) and a questionnaire asking about the presence of lower limb symptoms commonly attributed to venous disease (pain or ache, itching, tingling, cramp, restless legs, a feeling of swelling, and heaviness).

**Results** Mean age was 57 years (range 19-89); 100 (35%) were male, and 182 (64%) had CEAP clinical grade 2 or 3 disease. Jonckheere-Terpstra test for trend revealed that both physical (P<.0005) and mental (P=.001) HRQL worsened as the reported number of symptoms increased.

Patients reporting tingling (P=.016, Mann-Whitney U test), cramp (P=.001), restless legs (P<.0005), swelling (P<.0005), and heaviness (P<.0005) had a significantly worse physical HRQL than those who did not. Mental HRQL was also significantly worse in patients with tingling (P=.010), cramp (P=.008), restless legs (P=.040), swelling (P=.001), and heaviness (P=.035).

These significant relationships remained, and pain was also correlated with worse physical HRQL (P=.011), when linear regression was performed to control for CEAP clinical grade, age and sex.

**Conclusions** Physical and mental HRQL is significantly worse in patients with lower limb symptoms irrespective of the clinical severity of disease. This observation confirms that VV are not primarily a cosmetic problem and that rationing of treatment to those with skin changes excludes many patients with a lot to gain. Generic HRQL measures also allow comparison with interventions for other chronic conditions.

Notes

Horizontal lines for taking notes.

## Notes

### Endovascular Repair of Tandem Carotid Stenoses

Loubière H 1, Desal H 2, Azéma L 1, Costargent A 1, Chaillou P 1, Patra P 1, Gouëffic Y 1

1 Department of Vascular Surgery Institut du Thorax, University Hospital of Nantes ,

2 Department of Neuroradiology University Hospital of Nantes, France

1.

Tandem carotid stenoses combines simultaneous stenoses at the origin of the extracranial internal carotid (EIC) and intracranial internal carotid (IIC). We present 4 cases of patients treated with endovascular repair for tandem carotid stenoses.

Each case was discussed by a multidisciplinary team including vascular surgeons, neurologists and neuro-radiologists. Interventions were performed under general anesthesia in the neuroangiography laboratory. Patients were prescribed clopidogrel (75-mg/d) and aspirin (160-mg/d) 1 week before the intervention. Heparin (50UI/kg) was given during the procedure. First, IEC stenosis was treated by primary self expandable stenting without cerebral protection. Then IIC stenosis was treated either by a self expandable stent or a ballon expandable stent. Technical success for EIC and IIC stenoses was defined by residual stenosis at 30% and 50% respectively. Follow-up included physical examination and duplex scan at 1, 6, 12 months and yearly, and CT scan at 6 and 12months.

Patient 1 (48 year-old) who presented transient right hemiparesia had 70% stenosis of the left EIC and ipsilateral pre-occlusive IIC stenosis. Patient 2 (57 year-old) was asymptomatic and had 70% stenosis of the left EIC and the right EIC, and occlusion of the left siphon. Patient 3 (64 year-old) presented 70% stenosis of the right EIC and 70% stenosis of the ipsilateral IIC. Patient 4 (78 year-old) who presented transient right hemiparesia had 90% stenosis of the left EIC and 50% stenosis of the ispisilateral IIC. Technical success rate was 100%. No death or stroke were reported during the perioperative period. Mean hospital length of stay was 4.75 days. No clinical event was reported during the follow-up (mean: 24.5 months). Duplex scan and CT did not reveal thrombosis or in-stent restenosis.

In these cases, endovascular treatment of tandem carotid stenoses was safe and effective. These results should be confirmed by a larger study.

### Emergent Hybrid Procedure to treat Complicated Stanford Type III-B Acute Dissection

Gallardo Pedrajas F 1, Mosquera Rodriguez VX 2

1 Department of Vascular Surgery of the CHU A Coruña

2 Department of Cardiac Surgery of the CHU A Coruña, Spain

Complicated Stanford type B acute aortic dissection is associated with high mortality, because of the high risks of open surgery and the inherent complications in this disease. The treatment remains controversial despite recent unbridled enthusiasm in favor of stent grafting. In cases of inadequated proximal landing zones, a hybrid approach with supraaortic trunks transposition is an option to gain the place for a better stent graft placement.

We report the case of a 54-year-old man admitted to the Emergency Department with acute onset of back and abdominal pain, and left limb critical ischemia. Medical history included hypertension. A contrast enhanced multidetector computed tomography (MDCT) thoraco-abdominal scan showed a type B dissection with a huge proximal entry tear just proximal to the origin of the left subclavian artery (LSA), which was also dissected, with distal extension to visceral vessels and both iliac arteries. The patient was hemodynamically unstable with metabolic acidosis due to bowel and renal ischemia, so inotropic support was started. An emergent surgery was indicated due to his instability. After an approach through a median sternotomy, two 9 mm Dacron graft bypass from the ascending aorta to the left carotid and LSA were performed to gain a landing zone for the placement of a thoracic aorta stentgraft (34 x 150 mm) to cover the proximal tear of the dissection. Intraoperative angiography showed correct proximal placement of the stentgraft with recovering of visceral and renal perfusion, but still remained residual dissection of the left iliac artery with clinical signs of left limb ischemia. An extraperitoneal right-left femoro-femoral bypass (Dacron 8 mm) was performed with good result.

Postoperative major complications were acute renal failure, pneumonia, and a cardiac tamponade on the 14th postoperative day which required a surgical drainage. The patient was discharged after 12 days with oral administration of labetalol for hypertension. The patient remains well after 1 year of follow-up.

### Delayed Presentation of a Thoracic Aortic Injury by a Vertebral Pedicle Screw: a case report.

Gallitto E 1, Freyrie A 1, Gasbarrini A 2, Esteves Simoes C 3, Gargiulo M 1

1 Vascular Surgery – Bologna University, S.Orsola Malpighi Policlinic, Italy

2 Department of Oncologic and Degenerative Spine Surgery, Rizzoli Institute, Bologna, Italy

3 Department of Orthopedics and Traumatology, Spine Surgery Unit, Hospital Felicio Rocho, Belo Horizonte, Brazil

Iatrogenic aortic injuries by pedicle screws are rare but serious complications of spinal fixation surgery. We report a case of 55-years-old man, who underwent surgical correction of traumatic thoracic vertebral fractures in another institution. After 3 months of follow-up, computed tomography revealed a non-healing of the fractures, and that the misplaced pedicle screw at T4 had penetrated the descending thoracic posterior aortic wall. Patient underwent an open aortic repair, reconstruction of the anterior vertebral column and revision of the posterior arthrodesis by a vascular and orthopaedic surgery team simultaneously.

There were no post operative complications and he was discharged home within one week. The clinical case is discussed according to therapeutic options.

### Aortoenteric Fistula And Type III Endoleak As Late Complication Of EVAR

Martínez Gallego E 1; Ruiz Díaz E 2; Rielo Arias FJ 1; Pulpeiro Ríos JR 2; Gegúndez Gómez C 3, Conde Vales J 3; Pérez Carballo E 1; Durán Mariño JL 1; García Colodro JM 1

1 Department of Vascular Surgery; 2 Department of Interventional Radiology; 3 Department of General Surgery, Lucus Augusti Hospital, Lugo, Spain

Secondary aortoenteric fistula (AEF) have been recently described in patients that had undergone interventions to insert aortic endografts to treat aortoiliac aneurysms. The incidence seems to be lower than in open surgery and some authors have postulated that these AEFs appear after migration of the devices or endoleaks.

A 77 years old man went to the emergency unit for abdominal pain and important rectorrhage, needing blood transfusion. As relevant medical problems presents an abdominal inflammatory aortic aneurysm treated with an aorto-biiliac Vanguard stent graft in 1999, and a posterior repair in 2002, with a Zenith aortouniiliac and cross-over femoro-femoral bypass, due to premature failure of the Vanguard graft.

An abdominal duplex scan shows a 10cm AAA with important turbulence into the aneurismatic sac, and graft patency. The CT examination reveals the inflammatory aortic aneurysm with visceral branches involvement; secondary bilateral hydronephrosis due to ureteral obstruction for retroperitoneal fibrosis. The occluded branch of the first endograft seems to be very near to the posterior wall of the 3rd duodenal portion. A big endoleak is evidenced, apparently due to an arterial lesion by the aortouniiliac branch.

The gastroscopy, done to complete the diagnostic, shows a strange body in the duodenal wall without active bleeding in the lumen. An emergency arteriography shows a type III distal endoleak, due to Vanguard fabric disruption. A laborious repair of the endoleak is performed, extending the left branch until the hipogastric bifurcation.

The intervention is completed by 3rd and 4th duodenal portion resection with a duodeno-yeyunal anastomosis, finding an important duodenal inflammation, calcified wall aneurysm adhesion, and duodenal microperforation signs. Finally, the aneurysm was covered with omentum.

The postoperative patient underwent without complications, and an abdominal duplex scan and CT confirms the absence of leaks into the aneurismatic sac.

### Disruptive Endovascular Technology with Multilayer Stents as a Therapeutic Option in the Management of a Thoracoabdominal Aortic Aneurysm.

Hamada N, Sultan S

Western Vascular Institute, Department of Vascular and Endovascular Surgery, Galway University Hospital, Newcastle Road, Galway, Ireland.

**Introduction:** Patients with thoraco-abdominal Aortic Aneurysm Crawford Type II were classically treated by open surgical repair since 1955 by Etheridge and Rob (1). Such an operation for extensive TAAA still remains a surgical challenge, because extensive TAAA is an independent risk factor for mortality and its mortality (2). Another more recent, less invasive option is the hybrid procedure which consists of two stages, first is visceral debranching of the aorta and second is endovascular exclusion of the previously debranched aortic aneurysm. Full endovascular repair is applicable now with fenestrated grafts and branched grafts (3) or multi layered stent.

A 76 years old lady, ASA IV, was presented to our service with thoraco-abdominal aortic aneurysm Crawford Type II.

**Clinical History:** Patient had NSTEMI 1 year ago and ECHO showed prominent aortic root and dilated ascending aorta 4.4 cm 5.9 cm from aortic valve. She has past medical history of severe COPD –steroid dependent–, Hypertension, Dyslipidaemia, Auto immune Hypothyroidism and Idiopathic Angioedema. She is non smoker, social drinker and fully independent. She is allergic to Penicillin.

**Management:** CTA Aorta showed a 4.7cm thoraco abdominal aortic aneurysm Crawford Type II. Active surveillance programme was implemented and follow up in OPD, U/S 6 monthly and annual CTA Aorta were performed. One year later the aneurysm reached the size of 6.5cm.

Open or Hybrid repair with de-branching followed by TEVAR/EVAR were excluded because of the comorbidities and high mortality rate of the procedure. Her TAA Aneurysm was not suitable to be managed by branched endovascular graft.

The patient had a multi-layered stent covering the whole aneurysm and all visceral vessels. 1 day post operatively her duplex scan showed the Aorta shrunk to 2.46cm in the mid-distal abdomen with no obvious aortic sac visualized and no obvious endoleak. She was discharged home on second postoperative day well. Follow up CTA Aorta showed all the visceral branches are patent with good flow. Maximum thoracic aortic diameter shrank to 4cm.

Multilayered stents may divulge a resolution in such complex thoraco-abdominal aneurysm. Treating the aneurysm sac rather than excluding it may be the future management opportunity.

### Uncommon Type of Extraanatomic Redo Renal Artery Grafting for Takayasu's Arteritis Lesion

*Kulbak V, Pokrovsky A, Zotikov E, Burtseva E*  
A.V.Vishnevsky's Surgery Institute, Russia, Moscow

The objective of this report is to demonstrate the possibility and necessity of surgery for patients suffering from Takayasu's disease.

In 1984 a girl at the age of 6 was discovered hypertensive (150|80 mm Hg). During the examination the thoracoabdominal aorta stenosis was revealed and Takayasu's arteritis was diagnosed. Till 1985 the hypertension progressed to 300|150 mm Hg. Antihypertensive therapy had no effect. The girl underwent thoracoabdominal aorta replacement with implantation of visceral and renal arteries. Blood pressure decreased to 140|80 mm Hg after that procedure. In 1990 the right arteriosclerotic kidney was revealed and right-sided nephrectomy was performed.

For next 17 years the patient had stable mild hypertension. She had periodical anti-inflammatory drug therapy for that period. In 2007 health of the patient became worse, blood pressure increased to 250|100 mm Hg. Critical stenosis of the left renal artery was discovered during examination.

Attempt of left renal artery grafting was made through the left-sided thoracophrenolumbotomy. However, abdominal aorta and iliac arteries exposure was impossible due to hard retroperitoneal fibrosis. Left renal artery exposure was success only at the renal porta site. Distal anastomosis was made with the renal artery bifurcation. The inferior mesenteric artery was situated in the retroperitoneal space after previous surgeries. Its adequate diameter allowed perform proximal anastomosis with vascular graft (Gere-tex 8mm). The blood pressure decreased to 120-130|80 mm Hg immediately after the operation.

1 year after the surgery the patient gave birth to a healthy girl. She had normal pregnancy. 2 years after the surgery during a scheduled examination no significant lesion of reconstructed arteries was found, the renal artery graft was patent.

Stenosis of renal arteries are indications for surgery in patients suffering from Takayasu's disease. Inferior mesenteric artery can be used as proximal anastomosis site for renal artery grafting.

### Lower Limb Ischemia due to Occlusion of a Persistent Sciatic Artery Aneurysm. Case Report

*Tiago J*  
Clínica Universitária de Cirurgia Vascular do Hospital de Santa Maria, Centro Hospitalar Lisboa Norte, Lisbon, Portugal

A persistent sciatic artery is a rare embryological anomaly that may predispose to several complications. The authors report the clinical case of a 81-year-old man presenting with a right lower limb ischemia and a pulsatile mass in the buttock, for the last two months. He had no history of external trauma. Computed tomographic angiography demonstrated a complete and unilateral persistent sciatic artery aneurysm. During the pre-operative workup, spontaneous aneurysmal occlusion occurred, worsening the condition to a critical ischemia. The patient underwent, successfully, a distal femoro-popliteal bypass. Review of the literature confirms the rarity of this anomaly, which is frequently associated with degenerative changes such as aneurysmal formation and its complications (rupture, thrombosis, distal embolization and local compression – sciatic neuropathy). Surgical repair is recommended to prevent or treat such complications, as the present clinical case exemplifies.

### Ruptured Superficial Femoral Artery Aneurysm Simulated a Mesenchymal Tumor.

*Bujas Z, Simunović-Smirčić M, Sunko N, Alfier V, Kinkela S*  
Department of Surgery, Community Hospital Sibenik, Croatia

Atherosclerotic aneurysms of the superficial femoral artery are very rare. Of all peripheral aneurysms, 55% are popliteal and only 3% are located in the thigh. The distribution of the latter is 80% in the common femoral, 15% in the superficial femoral, and 5% in the deep femoral arteries. The natural history of these aneurysms is not very well known due to the rarity of the condition. True atherosclerotic aneurysms of the SFA occur in the elderly population. The risk of rupture is 46% and thromboembolic complications occur at an incidence of 19.9%

We present a case of superficial femoral artery aneurysm in 90-year-old male who presented with right calf swelling, without pain, and nonpulsating tumor at the inner surface of his right thigh. A computed tomographic scan revealed a mesenchymal tumor, a differential diagnosis like rhabdomyoma or rhabdomyosarcoma. On surgical exploration, ruptured superficial femoral artery aneurysm was identified. After achieving control of the aneurysm, which was subsequently resected and repaired with a prosthesis interposition graft. On the 7th postoperative day, the patient was discharged from the hospital, completely mobilized and had palpable peripheral pulsations. Accurate diagnosis and immediate surgical reconstruction gives a good prognosis for these aged patients.

### Aorto-Oesophageal Fistula. An Unusual Case of Mediastinal Air.

*Kay MD, Patel K, Desai A, Davies B, Bonser RS, Gourevitch D*  
Queen Elizabeth Hospital Birmingham UK

Thoracic endovascular aneurysm repair (TEVAR) is increasingly being used as a less invasive method for the management of thoracic aortic aneurysms and aortic dissections. Aorto-oesophageal fistula (AOF) is a rare but devastating complication of thoracic aortic repair with a poor patient survival. There are only a few documented case reports of AOF after TEVAR despite its increasing use. A patient with an AOF tends to present with haematemesis or pyrexia of unexplained origin; imaging demonstrates air in the posterior mediastinum and without surgery it is usually fatal due to exsanguination or mediastinitis.

We present 2 cases of AOF following thoracic endovascular stent graft repair. Case 1 is a 31yr old female who underwent TEVAR for a type B aortic dissection, and presented 18 months later with haematemesis, requiring a further stent graft to manage an AOF. The aorta was repaired with an extra-anatomical vascular reconstruction. The second case concerns a 79 male who underwent TEVAR to exclude a 5.3cm Thoracic aneurysm. This procedure was complicated by a type 1 endoleak which was managed successfully by further stent graft placement. The patient re-presented with persistent pyrexia and haematemesis. He also underwent an extra-anatomical reconstruction of his thoracic aorta.

With increasing use of endovascular prostheses, infective complications will increase, and although uncommon AOF must be considered in these patients. The presentation of haematemesis or PUO in a patient who has had a TEVAR should raise clinical suspicion and needs urgent investigation.

### Energy Drink Induced Acute Limb Ischaemia

Miller AS, Hopper AN, McLain AD

Royal Gwent Hospital Vascular Institute, Newport, Wales, UK

Over 400 million litres of energy drinks are sold in a European country each year and the popularity of these highly caffeinated beverages continues to rise despite considerable health concern.

Until recently there has only been anecdotal evidence linking energy drink consumption with cardiovascular morbidity and mortality. New evidence now suggests that high caffeine consumption is associated with hypertension, endothelial and platelet dysfunction.

Here we discuss a case of energy drink induced acute limb ischaemia in a young man with no traditional risk factors predisposing to peripheral vascular disease and highlight the new literature linking caffeine consumption with thromboembolic disease.

A previously fit and well 22 year old male presented on the acute vascular take with an acutely ischaemic right leg. He had no history of diabetes, hypertension, hyperlipidaemia or drug abuse. He was a none smoker but did confess to drinking roughly 17 cans of a popular energy drink per day for the last 2 years.

Investigations into the cause of this young man's disease failed to demonstrate any aetiology. Clot histology showed only organised thrombus with no evidence of atrial myxoma. No pathogens were isolated on extended culture and transthoracic echocardiography showed a structurally normal heart with no vegetations. Biochemical investigations failed to identify any underlying vasculitis or thrombophilia. Popliteal Artery Entrapment Syndrome and Cystic Adventitial Disease were excluded radiologically.

Adenosine is an important endogenous vasodilator and is essential for endothelium mediated dilation in hypoxic conditions. It is hypothesised that the detrimental effect of caffeine on vascular endothelium is as a direct consequence of this antagonistic effect on adenosine A2 receptors. However, recent research suggests that caffeine may also elevate systolic blood pressure, increases arterial wall stiffness and increase platelet aggregation, all of which "even in young individuals, may predispose towards thrombotic events".

### EVAR of the Aortic Arch with Transapical Placement of Side Branches.

Altreuther M

St. Olavs Hospital, Trondheim, Norway

In the last 2 decades, endovascular repair of aortic aneurysms (EVAR) has developed rapidly and is now widely used to treat abdominal aortic aneurysms (1). TEVAR for lesions in the thoracic aorta reduces short-term morbidity and mortality compared with open repair and is well established despite lack of evidence that there is a long term benefit (2). With fenestration and side branches, complex thoracoabdominal aneurysms can be treated (3). Lesions of the aortic arch are often complex and difficult to treat. Several methods, including hybrid procedures (4), chimney grafts (5) and in situ fenestration (6) have been described.

Transapical placement of aortic valves can be done with acceptable procedural risk and is performed regularly at several hospitals. Transapical placement of a stentgraft in the thoracic aorta has been performed both in an animal model and in one patient (7). Based on this, I believe that aortic branch vessels in the arch can be approached through the apex of the heart with acceptable procedural risk. The main body will be delivered with a transfemoral approach, and cannulation of the side branches must be done after partial release of the main body, as it is done in branched abdominal stentgrafts.

This approach will make cannulation and insertion of side branches easier than the retrograde approach, mainly because of shorter distance and less angulation. It could make EVAR with branched stentgrafts possible in a greater proportion of patients with arch aneurysms. However, this is at present only a hypothesis that has to be tested in an animal model first. On the following pages are illustrations of the transapical approach for a branched stentgraft.

### About Three Cases of Internal Carotid Artery Aneurysms Operated on as Emergency.

*Popa RF, Baroi LG, Raza A, Khawaja A, Popa C*

University Hospital, Sf. Spiridon, University of Medicine and Pharmacy "Gr. T. POPA" , Iasi, România

This is a retrospective review of 3 patients with primary aneurysms of extracranial internal carotid arteries treated surgically during a period of 2 years in our clinic. Each case had a particularity in terms of emergency: one of the cases had expansive hematoma caused by a diagnostic puncture manifested by a groing and compressing cervical mass, the second and the third ones had, apart from the local compression symptoms (dysphonia, dyspnoea, nerv compression), signs of acute loss of blood due to the rupture of aneurysms. All of them were atherosclerotic.

All three patients were admitted on emergency and a preoperative echo-Doppler and contrast spiral-CT were done in the interval of 12 hours. All patients benefited by open surgical treatment a short time after the investigations. The procedure consisted of partial aneurysmectomy and venous graft interposition. Intraluminal shunts were utilized in all cases. The patients were followed up after the 1st month by contrast angio-CT and echo-Doppler at 1, 3, 6, 12, 24 months.

No intraoperative deaths occurred .The mortality is 0% even after 24 months. The neurologic symptoms were relieved by open procedure and the primary patency of the graft was 100%.

The surgical treatment is imposed by the high mortality risk caused by hemodynamic and respiratory complications. Open repair remains the method of choice in treating internal carotid artery aneurysms. The use of the venous graft is preferred to the synthetic graft for the interposition (less chance of infection). Although angio-MRI or CT spiral angiography with three-dimensional reconstruction allows good anatomic delineation of the aneurysm and confirm or not a good postoperative result, the Duplex scan may also be utilised like first step in preoperative diagnosis and almost like a reliable technique in postoperative follow up .

### Vein Patch Reconstruction In Infrarenal Aorta Rupture Due To Bacterial Aortitis.

#### Case report.

*Maszkowski M, Korman D, Ivonen R*

Surgery Dept. County Hospital, Östersund, Sweden

Primary infected aortic aneurysms remain a rare clinical problem. Treatment includes extensive surgical procedure such as in situ repair with graft placement (autologous, bovine, homograft, silver dacron) or extraanatomic by-pass, broad spectrum antibiotics, long ICU stay. Endovascular treatment for infected abdominal aortic aneurysms has been reported, with acceptable short-term survival, recently.

There are described two men 72 and 77 years old in this case report. They have been treated for mycotic aneurysms with in situ saphenous vein patch reconstruction.

The first patient presented cholangitis symptoms with *Staphylococcus aureus* growth in blood culture. On the 7th day of cholangitis treatment an acute infrarenal aorta rupture occurred. The patient was operated with in situ saphenous vein patch reconstruction of the aortic wall defect. The patient is well doing and the follow up is 3,5 years now.

The other patient presented urinary tract stone symptoms with infection. Detailed diagnostic showed an acute mycotic aneurysm in the infrarenal aorta. He was operated with in situ saphenous vein patch reconstruction of the aortic wall defect. The patient is doing well and the follow up is 4 months now. They do not present infection symptoms and do not take antibiotics now. CT controls have not shown aneurysm in the reconstruction site.

Vein patch reconstruction in destroyed aortic wall, which usually is not so extensive, can be an alternative to approved surgical procedures.

**The Management of a Case of Phlegmasia Cerulea Dolens with Intravenous Catheter Delivered Thrombolysis.**

*Patel PH, Salehian S, Damani N, Nayak PN, Sarin S*  
West Hertfordshire NHS Trust, Watford, United Kingdom

Whilst phlegmasia dolens is widely reported in the literature, the management remains extremely difficult with high rates of tissue loss and gangrene. We report the case of a 31 year old previously fit and well lady who presented with lower limb oedema and erythema, associated with right foot gangrene and tissue loss. Venous duplex scanning (VDS) confirmed deep vein thrombosis extending to the proximal common iliac veins. The patient reported a two week history of bilateral leg swelling following a long distance flight, for which she was anti-coagulated. Despite therapeutic anti-coagulation, the thrombosis had propagated proximally to the iliac veins.

Computed tomography angiography confirmed thrombotic occlusion of external iliac and femoral veins with patent arterial vessels. Bilateral adnexal ovarian masses with pelvic lymphadenopathy were incidentally noted. An inferior vena caval filter and a catheter extending to the right common iliac vein were inserted, via an internal jugular approach. Continuous intravenous thrombolysis directly into the thrombus was commenced with tissue plasminogen activator (tPA). Successful regression of the thrombus was confirmed at 7 and 14 days with VDS. The tPA infusion was continued for 10 days with no complications. Further investigations returned raised tumour markers, Ca 125 of 955, and a tissue diagnosis of dysgerminoma ovarian cancer.

There are a variety of methods for managing phlegmasia cerulea dolens, the mainstay being distal intra-arterial thrombolysis therapy. The literature reports mixed success with significant morbidity. Our case describes the successful case of local intravenous thrombolysis with thrombotic regression and limb salvage with minimal residual morbidity. Our experience shows that intravenous as opposed to intra arterial thrombolysis may be the mainstay in the treatment of acute limb ischaemia secondary to phlegmasia ceruleans.

Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

**Duplex Immediately After EVAR Deployment**  
Rogan C, Barbour M, Grewal P, Davis M, Hamilton G  
Royal Free Hampstead NHS Trust

**Introduction**      The European Society of Vascular Surgery published guidelines in January 2011 on the management of Abdominal Aortic Aneurysms. **Aim of the study**      As a consequence, we reviewed our current practice and protocols; which involved a Duplex examination within the first week of EVAR deployment.

**Materials/Methods**      We retrospectively interrogated a database of successive aortic Duplex scans performed between August 2009 and March 2011. We identified all Duplex scans performed within one week of endovascular aneurysm repair. All scans were performed by a trained clinical vascular scientist.

**Results**      One hundred and fifty two scans were identified as performed within 1 week of EVAR deployment. Satisfactory images were acquired in 77 patients (51%) the remainder had bowel gas and motion artefacts precluding good visibility of the stent graft. In 39 patients (26%) no flow was seen in the EVAR stent graft due to its recent deployment and non porosity of the fabric. Two patients were uncooperative and images were not obtained. The following endoleaks were identified: Type I – 1, Type II – 3, type III – 3.

**Conclusions**      The incidence of positive findings requiring intervention early was very low. As a consequence of this our practice has now changed and the first Duplex scan is now performed 4-6 weeks post operatively in conjunction with an abdominal x ray. CT angiography is utilised if more information is required or an endoleak is identified.

**Notes**

Horizontal lines for notes.

## How to Diminish Major Amputations in Diabetic Patients; the "Toe and Flow" Concept Approach.

Osma S, Ortiz N, Pesquera C, Iglesias T, Perez E, Berenguer JJ, Lourido C, Chirivella T, Vascular nurses, podiatrists and Outpatient management unit. Gurutzetako Ospitalea; Hospital de Cruces, Barakaldo-Vizcaya, Spain

**Introduction**  
**Aim of the study** Diabetes is the leading cause of non-traumatic amputation of the lower extremity in Europe and the USA. The Diabetic Rapid Response Acute Foot Team (DRRAFT) guidelines, published in 2009, suggest that the vascular surgeon and diabetic podiatrist constitute the "irreducible minimum" in the formation of a diabetic foot team.

Given the associated high costs, not only for patients but also for the healthcare system, we are applying the "toe and flow" concept approach to solve this problem, namely, to diminish the number of major amputations in diabetics and save money.

**Materials/**  
**Methods** Our team is working on three areas: primary prevention by diabetic nurses; acute intervention when peripheral arterial disease or infection is present, by podiatrists, vascular nurses and vascular surgeons and postoperative care and follow-up by an outpatient management unit. We have outlined algorithms for urgent referral to our vascular unit.

**Results** Retrospectively, we compared minor and major amputations during the years 2008 and 2009 at our institution with a catchment population of 372,806. In 2008, there were a total of 55 minor and 37 major amputations, while in 2009 there were 79 and 23 respectively, representing a reduction of 62.16% in major amputations. Of all the amputees, more than 60% were diabetics. Median hospital bed days have been reduced, to 22.28 in 2008 and further to 18.8 in 2009 (a reduction of 24.59%).

**Conclusions** More than 35% of major amputations in diabetics could be prevented by improved screening, along with earlier referral to a vascular unit and more coordinated treatment in a multidisciplinary team which the minimal expression is the "toe and flow".

Foot problems account for largest number of hospital bed days used for diabetic patients. Through the work of our out-patient management unit we have managed to reduce overall hospital bed days and cost by nearly 25%.

## A Prospective Analysis of Vacuum Assisted Closure Therapy for Surgical Site Infections in Vascular Surgery.

Stachmann A 1,2, Bisdas T 1, Weishäupl-Karstens P 1,2, Haverich A 1, Wilhelmi M 1, Teebken OE 1  
1 Division of Vascular and Endovascular Surgery, Department of Cardiothoracic, Transplantation and Vascular Surgery; 2 Division of Perioperative Wound Management, Department of Cardiothoracic Transplantation; Hannover Medical School, Hannover, Germany

**Introduction**  
**Aim of the study** To assess the effectiveness of vacuum-assisted closure (VAC) therapy for the treatment of surgical-site infections (SSI) after arterial or venous surgery.

**Materials/**  
**Methods** From 01/2008 to 12/2010, 3,755 patients undergoing arterial or venous surgery were reviewed. Surgical procedures been included were vascular reconstructions in lower extremities (470 patients, 13%), endovascular procedures requiring femoral artery exposure (251 patients, 7%), amputations (86 patients, 2%), embolectomies (106 patients, 3%) and saphenous vein (1,963 patients, 52%) or radial artery harvesting (879 patients, 23%). SSI was defined according to CDC-criteria. Primary endpoint was the duration of VAC-therapy. Secondary endpoints were 30-day mortality, amputation and local (infection-related) complications (graft infection, bleeding and false aneurysm).

**Results** 35 patients developed perivascular SSI. Infection entry sites were the groin in 17 patients (49%), the amputation's wound in 6 patients (17%), the dermatofasciotomy for compartment syndrome in 3 patients (9%), the thigh in 2 patients (6%), the forearm in 1 patient (3%) and finally the saphenectomy wound in 6 patients (17%). Median time between initial operation and initiation of VAC-therapy was 20 days (5-49). Most frequent microorganism was *S. epidermidis* (9 patients, 26%). Superficial- and deep SSI was diagnosed in 15 (43%) and 20 (57%) patients respectively. Median duration of VAC-therapy was 19 days (9-36) with a median number of 4 VAC-changes (3-6) per individual. 30-day mortality amounted to 3% (1/33 patients). In 2 patients (6%) an amputation after below-knee compartment syndrome was performed. No vascular complications were observed. The logistic regression analysis of diabetes mellitus, peripheral arterial disease (PAD) and depth of SSI revealed PAD as risk factor for a VAC-therapy longer than 10 days (OR:9.67, 95%CI:1.66-89.10, P=0.04).

**Conclusions** VAC-therapy of perivascular SSI in extremities remains an effective and safe method with low mortality and amputation rates. The groin remains the most frequent infection entry site. PAD is a risk factor for prolonged VAC-therapy.

## Coordinating Endo Vascular Aneurysm Repair; the Role of the Vascular Nurse Practitioner

C Thomson

Royal Bournemouth Hospital, United Kingdom

### Introduction

#### Aim of the study

With recent advances in endo vascular repair of patients with aortic aneurysm the role of the vascular nurse practitioner at the Royal Bournemouth Hospital, England, has evolved in order to ensure a comprehensive and seamless pathway for patients. This presentation aims to discuss how the role of the vascular NP has evolved over the last few years, and how patients with AAA are managed in a local general hospital.

The Royal Bournemouth Hospital boasts a catchment population of approximately 550,000. The busy vascular unit is maintained with 3 Vascular Consultants, 3 interventional radiologists and 22 Vascular inpatient beds; 800 vascular/endovascular procedures are performed per annum. The first endovascular repair of abdominal aortic aneurysm was performed at the Royal Bournemouth Hospital in 1998, and currently we are performing 80% of our aneurysm repairs under endovascular procedure as opposed to open repair; thus a natural progression for the Nurse practitioner role has been to co ordinate the pre operative/peri operative and post operative care of these patients, to encourage a continuity of care for both patient and surgeon to create a seamless pathway for those patients undergoing EVAR at the Royal Bournemouth Hospital.

### Materials/ Methods

Patients are identified by the Nurse Practitioner within clinic or from referral. CT scans are implemented when appropriate, the patients and their relatives counselled by the Nurse Practitioner appropriately, and the patients are discussed in the vascular multi disciplinary team meeting. The Nurse Practitioner will liaise with stent manufacturers accordingly. Once agreed for device the NP will then pre assess and continue to counsel the patient and relatives including consent. The Nurse Practitioner assists during surgery and continues to assess the patient on return to the ward highlighting and trouble shooting any potential concerns. Discharge is completed by either Nurse Practitioner /medical staff and the patient is followed up in an outpatient clinic with the Nurse Practitioner. A database is compiled of ALL of the EVAR cases to ensure a comprehensive service is maintained.

### Results & Conclusions

The role of the Vascular Nurse Practitioner is of immense benefit when organising a busy clinical work load. From the referral through to discharge of the patient, the Nurse Practitioner is involved in every step to create a seamless pathway for the patient and their relatives.

## A Distressed Personality in Patients with Intermittent Claudication: 1-Year Walking and Health Status Outcomes Following Supervised Exercise Therapy versus Walking Advice. A Future Role for the Vascular Nurse?

Dalen HCW 1, Nicolai SP 2, Lauret GJ 1, Smolderen KG 3,4, Vriens P 5, Teijink JAW 1, 6

1 Department of Vascular Surgery, Catharina-hospital, Eindhoven, The Netherlands; 2 Department of Surgery, Maximá Medical Centre, Veldhoven, The Netherlands; 3 Saint Luke's Mid America Heart and Vascular Institute, Kansas City, Missouri, USA; 4 Department of Psychology and Health, Centre of Research for Psychology in Somatic Diseases (CoRPS) Tilburg University, Tilburg, The Netherlands; 5 Department of Vascular Surgery, St. Elisabeth hospital, Tilburg, The Netherlands. 6 Caphri Research School, Maastricht University, Maastricht, The Netherlands.

### Introduction

#### Aim of the study

Intermittent claudication (IC) occurs as a result of chronic atherosclerotic disease. The initial treatment addresses cardiovascular risk factors and supervised exercise therapy (SET) to improve patients' quality of life and walking distance. Whether psychological distress is a barrier in maximizing treatment results following SET, is unknown. We compared (S)ET results in patients with IC and a distressed (Type D) personality versus patients who did not have such personality.

### Materials/ Methods

As part of the EXITPAD study - a multicenter RCT of exercise therapy as a single walk advice (WA) versus SET provided by a physiotherapist - patients from one vascular centre completed the DS-14 questionnaire to assess the presence of having a Type D personality (score  $\geq 10$  on subscales negative affectivity and social inhibition). The primary outcome measure was 1-year change in absolute claudication distance (ACD); secondary outcomes were 1-year change in functional claudication distance and health status changes (as assessed with the subdomains of the Short-Form 36, SF-36). All outcome measures were compared by the presence of having a Type D personality.

### Results

In total, 120 patients were included in the WA (n=40) and SET group (n=80). Type D personality was present in 20% in both study groups. After 1 year follow-up, no significant increase was found in ACD in patients with Type D personality and WA. A significant increase was seen only in the SF-36 domains (Physical Functioning, Bodily Pain and Social Functioning) of the SET group without type D. Type D patients as well as patients with a WA showed no increase in their 1-year health status scores.

### Conclusions

Having a distressed personality was associated with compromised 1-year walking and health status outcomes following SET. Future research is needed to identify why these patients fail to obtain the same treatment benefit as their non-distressed counterparts. Furthermore, the role of vascular nurses in coaching Type D personalities should be expanded, in order to further prioritize care towards this burdened group of patients.

### Nursing Approach to Transjugular Intrahepatic Portosystemic Shunt (TIPS)

Theodoropoulos T, Mailli L, Papapetridou E, Brountzos E

2nd Radiology Department, General University Hospital "ATTIKO", Athens, Greece

**Introduction**  
**Aim of the study** The aim of TIPS placement is to divert portal blood flow into the hepatic vein, so as to reduce the pressure gradient between portal and systemic circulations. This procedure is used to treat the complications of portal hypertension, including variceal bleeding, portal gastropathy, ascites and hydrothorax.

**Materials/**  
**Methods** Each patient was evaluated before the procedure by a multidisciplinary team comprised of the interventional radiology (IR) doctors, specialized IR nurses, anaesthesiologists and pathologist. IR nurse was aware of the medical history, the procedural plan, the anaesthesia that would take place, the possible need of blood transfusions, the good standing of all necessary materials and equipment at angiographic suite, as well as preparing the patient. During the procedure vital signs are monitored, drugs, RBCs, platelets are administered when necessary. Continuing arterial pressure measurement and urine volume measurements are mandatory. In case of complication, all necessary actions are taken by the nursing staff after calling blue line. During procedure IR nurse will provide IR doctor with all the necessary tools (wires, catheters, balloons, stents, TIPS kit, etc) in order to complete the TIPS. Post-procedural care is equally important for completing a successful procedure and includes assessment of vital signs, pain control, hydration, hepatic encephalopathy prevention and psychological support.

**Results** From 1998 until 2011, 72 patients (43 males, 29 females) were treated in our institution with TIPS. The aetiology of TIPS intervention was: Budd-Chiari syndrome, uncontrolled bleeding, resistant ascites, variceal bleeding, hepatorenal syndrome. Technical success was 100%. One death occurred shortly after completion of the procedure. Complications comprise: haemoperitoneum (6,9%), transient encephalopathy (11,1%), pseudoaneurysms (2,7%), haemobilia (1,4%).

**Conclusions** It is important for the nursing staff to be familiar with this newly developed technique. The well-trained and well-informed nurse can play an essential role in evaluating the clinical course of the patient before, during and after the procedure.

### A Feasibility Study for the use of Surgical Endoluminal Radiofrequency Ablation for Recurrent Varicose Veins.

Sinclair A, Patel PH, Nayak PN, Sarin S

West Hertfordshire NHS Trust, Watford, United Kingdom

**Introduction**  
**Aim of the study** Endoluminal surgical management of varicose veins is now extensively used, radiofrequency ablation (RFA) endotherapy is one of the potential modalities. The indications for primary varicose vein surgery are widely reported. There are a variety of surgical options for recurrent varicose vein treatment, with limited published guidelines for the use of endoluminal ablation. We report our results on the surgical treatment of recurrent varicose veins with RFA endotherapy after venous duplex scanning (VDS).

**Materials/**  
**Methods** Retrospective data on all patients having VDS for recurrent varicose veins was collected in a single centre between 2008 and 2010. All scans were performed by two vascular technicians. Data on the primary surgical procedure, distribution, origin and diameter of recurrences were recorded. The patients were then followed to determine if RFA endoluminal therapy was performed.

**Results** 277 patients had VDS for recurrent varicose veins over the period of the study, with a mean age of 62 years. According to our VDS criteria, 58 (21%) patients were selectively amenable for RFA endotherapy. 41 (14%) patients progressed to have endoluminal ablation with or without other concurrent procedures.

**Conclusions** Our results suggest that endoluminal ablation of recurrent varicose veins is feasible in a limited, well selected cohort. It is by means not the only surgical option for these cases, however in specific cases it is a minimally invasive option with a shorter recovery and days to discharge.

## Stroke and Transient Ischaemic Attack Awareness

Sandison S 1&2, Blest N 2, Foreman R 2, Puckridge P 1&2, Russell D 1 & 2, Spark J 1&2

1 Flinders University, 2 Department of Vascular Surgery, Flinders Medical, Adelaide, South Australia.

<b>Introduction</b>	Stroke is a leading cause of death and functional impairment.
<b>Aim of the study</b>	Current research has shown the need for urgent investigation and treatment of patients with symptoms of transient ischaemic attack (TIA) or stroke. This study examined knowledge of stroke warning signs, among the general public, including what they would do if they were to develop such symptoms.
<b>Materials/Methods</b>	A population study of randomly selected members of the general public in Adelaide, South Australia. A simple survey assessed knowledge of stroke warning signs and gave four options for management. The survey was conducted on three separate occasions: before, immediately after and 3 months after the National Stroke Foundation's Stroke Week "FAST" campaign in 2009. The outcome measures were the public perception of risk factors and warning signs of stroke and what the members of the public would do if presented with a range of warning signs. They were also asked to define FAST.
<b>Results</b>	The three surveys were completed by 251 members of the public. Hypertension and smoking were recognised as risk factors for stroke by 71% and 53% of respondents respectively. Before National Stroke Week, slurred speech was identified by 51% and both slurred speech and upper limb sensory loss was identified by 62% as warning signs to provoke presentation to an emergency department (ED). Amaurosis, upper limb sensory loss, upper limb numbness and upper limb weakness were correctly identified individually as warning signs to attend an ED by fewer than one-third of respondents. There was no significant difference in the survey results following National Stroke Week
<b>Conclusions</b>	Public awareness of the symptoms of stroke, and what to do about them, is limited. There was little improvement after the national week-long awareness campaign. The lack of public awareness about stroke warning signs must be addressed

## The Clinical Pathway of a Patient with PAD

Sieben A, Roeleveld J

UMC St Radboud Nijmegen, The Netherlands

Presenting at the outpatient clinic a patient referred by the general practitioner.
<b>Medical history:</b>
• Hypertension • Hyperlipidemie • TIA
Current medication:
• Simvastatin • Hydrochlorothiazide
<b>Visit 1.</b>
The patient is seen by the nurse practitioner (NP) of the vascular surgery outpatient clinic under supervision of the vascular surgeon. Anamnesis, physical examination, interpretation of ABI is performed by the NP. She also informs the patient about the therapy.
<b>Therapy:</b>
• Supervised walking exercise • Prescription: ascal 80 mg
<b>Follow up appointments:</b>
• Evaluation of the walking exercise • Cardiovascular screening program and instructions for using the • Individualized web portal.
<b>Visit 2.</b>
Screening duplex: carotid arteries and abdominal aorta.
Determination off: blood lipid levels, glucoses, blood pressure, waist circumference, BMI. ROSE questionnaires for angina pectoris and CVA. Family history. ECG, 24 hour ambulant blood pressure measurement and a lifestyle questionnaire.
All results are entered in the web portal and presented at the multidisciplinary meeting for all the cardiovascular nurse practitioners and the internist and cardiologist. Based on the outcomes they give advice on how to minimize the cardiovascular risk.
<b>Visit 3.</b>
One week after screening. The NP and patient discuss all risk factors and make an individual plan. Prescription: atorvastatin 40 mg and an ACE-inhibitor. Life style: loose weight by healthier diet and more exercise. Together they make a plan where the patient sets his goals.
<b>Visit 4.</b>
Evaluation of the individual plan. Measuring: BP, lipid, kidney blood levels. The patient lost 3 kgs.
<b>Visit 5</b>
Evaluation of the walking exercise program. The pain free walking distance 10 minutes. Evaluation of the individual plan according risk factors.
<b>Visit 6</b>
After one year: evaluation of walking exercise, pain free walking distance is 15 minutes. The patient is pleased with the result. Evaluation of the individual plan according the cardiovascular risk factors.
The patient will be discharged from our outpatient clinic. A letter is written to his GP by the NP

## Notes

### Endovascular Repair of Multiple Splachnic Artery Aneurysms.

*Psathas E 1 , Lioudaki S 1 , Katsargyris A 1, Chatziioannou A 2, Karatzas T 1, Klonaris C 1*  
1 2nd Department of Propedeutic Surgery ,Division of Vascular and Endovascular Surgery , University of Athens Medical School, Laiko Hospital, Athens, Greece; 2 Department of Inteventional Radiology, University of Athens Medical School, Aretaieon Hospital , Athens, Greece

Splachnic artery aneurysms are rare and often asymptomatic. Diagnosis and treatment of this condition is often challenging ,while conventional open repair is related with increased morbidity and mortality.

We report a case of a 51-year old female patient who was referred to our department, due to the rare coexistence of multiple splachnic artery aneurysms, located mainly in arterial branches of the superior mesenteric artery (SMA). Her medical history was unremarkable, apart from cholocystectomy in 2008 for chololithiasis and mild smoking. The patient reported symptoms of mild recurrent abdominal pain and dyspepsia during the last 6 months, with negative endoscopy examination. CTA imaging revealed the existence of three concurrent (tandem) splachnic aneurysms: A 28-mm diameter saccular aneurysm of the pancreato-duodenal artery, a second 20-mm in diameter, originating from the posterior branch of the inferior-pancreato-duodenal artery (infrapancreatic) and a smaller (12-mm) aneurysm of the gastro-duodenal artery. Furthermore, CTA and DSA revealed an ostial celiac artery stenosis. The patient underwent percutaneous endovascular repair of the two larger infrapancreatic aneurysms via a right brachial approach. Both aneurysm sacs were catheterized with micro-catheters and were successfully embolized with coils. The patient was discharged the day after, while follow-up imaging revealed successful occlusion of both aneurysms.

Endovascular repair of saccular splachnic artery aneurysms with coil embolization is safe and effective offering minimal morbidity and short hospitalization. Careful preoperative planning based on extensive study of the preoperative images along with advanced endovascular skills are required for optimal results in such complex cases.

### Laparoscopic Nephrectomy, Ex-vivo Repair and Autotransplantation: a Safe Approach to Renal Artery Aneurysm.

Castagno C 1, Oderda M 2, Soria F 2, Bertoldo U 1, Gontero P 2, Rispoli P 1

1 University of Turin, Department of Vascular Surgery 2, Molinette Hospital, Turin, Italy

2 University of Turin, Department of Urology 1, Molinette Hospital, Turin, Italy

Renal artery aneurysms are being discovered more frequently due to increased use of non-invasive imaging. Complex renal artery aneurysms involving multiple secondary or tertiary branches are not suitable for in vivo or endovascular treatment and often require ex vivo repair with autotransplantation. This technique has been practiced for years, but a large incision along the bed of the twelfth rib extending down to the pelvis is needed. In order to minimize incisional morbidity, we applied a laparoscopic nephrectomy combined with backbench ex vivo repair, followed by autotransplantation in iliac fossa through a small laparoscopic extraction incision.

A 74-years old woman came to our attention with an incidental finding of left renal artery aneurysm involving secondary branches, whose diameter was 2 cm. First, she underwent selective angiography, but it was not possible to treat it with embolization. Thus, we performed a laparoscopic nephrectomy, ex vivo repair and autotransplantation in ipsilateral iliac fossa.

Laparoscopic nephrectomy with ex vivo repair of the aneurysm followed by autotransplantation was successfully employed with no postoperative complications. Renal function remained unchanged and there were no ureteral complications following surgery. The patient was discharged in 15th postoperative day. A 1-month renography demonstrated unchanged renal function and a 2-month ultrasound imaging showed patency of the anastomoses and normal intraparenchymal resistances.

Laparoscopic nephrectomy, ex vivo repair and autotransplantation provides a minimally invasive option in the treatment of distal renal artery aneurysm with good short-term results.

### An Unusual Technique for Superior Mesenteric Artery Revascularization.

Gemayel G, Khabiri E, Mugnai D, Murith N, Kalangos A

Department of Cardiovascular Surgery, University Hospital of Geneva

Faculty of Medicine, University of Geneva, Switzerland

Endovascular surgery became the mainstay of superior mesenteric artery (SMA) revascularization. When it is not technically feasible, different surgical options exist and classically consist of a retrograde or an antegrade bypass from the distal and the supraceliac aorta respectively. We describe an unusual technique of SMA bypass using the ascending aorta as inflow.

A 47 year old female was admitted to our hospital for a complicated type B aortic dissection with dynamic ischemia of the visceral renal arteries. She underwent an urgent endovascular fenestration to expand her collapsed true lumen but subsequently developed acute thrombosis of the SMA.

After an initial failed attempt to stent the SMA, an urgent ascending aorta (AA) to SMA bypass was successfully performed using an ePTFE graft. The choice of the proximal anastomosis on the AA was dictated mainly by the absence of an adequate more distal site in a frail dissected wall of the whole descending aorta reaching both external iliac arteries. The patient did well and was discharged from the hospital at day 21 with a patent graft.

While stent graft placement is the treatment of choice of complicated type B dissection, endovascular aortic fenestration is a valid second alternative specially in dynamic occlusion and collapse of the true lumen. Progression of the dissection into the SMA is a life threatening condition and adjunct stenting becomes mandatory to preserve its patency. When SMA stenting fails, open bypass from the descending aorta and iliac arteries is problematic and dangerous because of the dissected fragile wall. Using the ascending aorta as an inflow might be a safe and valuable alternative to restore flow to the SMA.

Exotic surgical bypasses like AA to SMA in a special setting such as type B dissection is a valid alternative when other traditional measures fail or becomes technically impossible.

#### Staged Open, Endovascular and Hybrid Repair of Complex Concomitant Mycotic Aneurysms Following an Insect Bite.

Perera AH, Gibbs RGJ

Department of Vascular Surgery, Imperial College Healthcare NHS Trust, London, UK

A 59 year old lady developed a painful abscess in her upper back following an insect bite. The abscess was drained, and cultures grew *Prevotella*. She had continued back pain, and a CT scan performed revealed multiple mycotic aneurysms. There were no treatment options available in her home country and she was referred as an emergency to our regional vascular unit. On admission she was pyrexial with a white cell count of 9.0 and a c-reactive protein level of 56. CT scan revealed 3 concomitant saccular mycotic aneurysms which included a 3cm left subclavian artery aneurysm, a 5cm descending thoracic aneurysm after which the aorta returned to a normal diameter, and a contained rupture of a 12cm type IV thoraco-abdominal aneurysm. Diagnosis of a mycotic aneurysm was based on sepsis (fever, leucocytosis and pain), positive blood culture and characteristic radiological appearance of the aneurysm wall. She received pre-operative antibiotics.

The ruptured type IV aneurysm was repaired via an open thoraco-laparotomy type IV approach with revascularisation of her coeliac axis, SMA and left renal artery. Her right renal artery could not be salvaged as the ostium was too aneurysmal and sutures could not be taken. She made a good recovery and 3 weeks later a thoracic stent was performed to exclude the mycotic aneurysm of her mid-thoracic aorta. 16 months later the final stage of her mycotic aneurysmal disease repair was performed when she underwent an aortic arch hybrid repair of her left subclavian aneurysm. A right to left carotid-carotid crossover graft was tunnelled anteriorly with a further jump graft down to her left subclavian artery. The left subclavian artery was clipped just proximal to the origin of the left vertebral artery. A thoracic stent graft was then landed covering the origin of the left carotid and subclavian arteries. She made a rapid recovery and follow up CT surveillance at 1 and 6 months revealed successful exclusion of the aneurysms and satisfactory graft flow. She had a 6 week course of intravenous antibiotics post the initial procedure, and she will remain on oral antibiotics for life.

Primary mycotic aneurysms are rare entities that provide significant challenges to the vascular surgeon. The gold standard treatment of resection of the infected aorta with excessive debridement of the peri-aortic tissues followed by reconstruction of the arterial flow together with long-term antibiotic treatment<sup>1</sup> is associated with a high morbidity and mortality. The treatment of mycotic aneurysms has altered drastically over the last decade with the evolution of endovascular repair. The literature and our own experience<sup>2</sup> revealed that whilst open repair continues to prevail as the standard treatment, endovascular treatment has vastly increased the therapeutic options. The management of mycotic aneurysms remains a topical issue as there is currently no consensus on timing of repair or modality of treatment. We demonstrate the use of a staged approach combining open, endovascular and hybrid procedures for the management of complex concomitant mycotic aneurysms, including a rupture. Each patient should be treated individually based on location, rupture and co-morbidities, as illustrated by this case.

#### Treatment of Aneurysmatic Sac Infection with Fresh Arterial Allograft after Endovascular Aortic Repair for Abdominal Aneurysm of Aorta.

Kanálíková K Jr 1, Tomka J 1, Nečpal R 1, Dulka T 1, Vulev I 2, Balík R 2, Balčík T 2, Mojeráik M 2, Kanálíková K 3  
1 Dep. of Angiosurgery, 2 Dep. of Interventional Radiology, 3 Dep. of Cardiology, NÚSCH, Bratislava, Slovakia

Recently, guidelines of management of abdominal aortic aneurysms had been published. Treatment nowadays make possible, beside open surgery repair, endovascular aortic repair (EVAR), actual in selected patients. Infection of abdominal aortic aneurysm sac is a rare condition. In literature there exist only a few documented cases. Presentation would like to describe some treatment option by way of our case-report.

Authors present the case of 72-years-old patient with many co-morbidities, in whom infrarenal aneurysm of abdominal aorta had been diagnosed. Patient underwent implantation of percutaneous endovascular aortic device (Endurant stentgraft system) in June 2010. Procedure was without serious complications. About six weeks later, patient presented with septic febrile state of unknown origin. He underwent series of examinations, finally uncovering presence of spondylitis in L2- L4 region with perivertebral microabscesses and infection of aneurysmatic sac. Cultivations of hemocultures provided *Staphylococcus hominis* infection. Combined wide-spectrum antibiotic therapy (linezolid, meropenem and fluconazol) had been initiated. Because of inadequate effect and persistent subfebrilities, patient had been indicated for intervention. During surgery, partial resection of infected aneurysmatic sac had been provided, followed by lavage of pouch and abdominal cavity. Stentgraft had been completely explanted and fresh aortic allograft in form of aorto-bifemoral bypass had been implanted to patient. Orthopaedist (spondylosurgeon), presented at intervention, advised conservative approach (findings on vertebral column). Antibiotic therapy continued after surgery for 3 months (later changed to linezolid alone) following the advice of clinical pharmacologist and orthopaedist. From 7th day after surgery, low-dose immunosuppressive therapy using tacrolimus had been initiated (targeted serum values of 3 to 5 ng/ml). Gradually signs of inflammation process declined and patient had been doing well. Imaging exams showed good effect of reconstruction. There were no signs of graft rejection, too.

After dismissal he had been followed-up steadily. However, in February 2011, on regular out-clinic survey, patient presented with serious pancytopenia (particularly serious anaemia), with need for admission to hospital in order of further investigations. According examinations, the reason for pancytopenia was established to be the combination of antibiotic and immunosuppression therapy with tacrolimus. Administration of antibiotics terminated. It was succeeded by improvement in blood sample tests. No signs of recurrence of inflammatory process has been detected. Patient is continuously kept under review (followed) in our outpatient clinic, with no further complications by now.

There exists only a few reports, using fresh (cryopreserved) arterial abdominal allograft in treatment of prosthetic graft infection. As well as need of further therapy is not well established, yet. We tried to follow-up treatment options from some articles, experimental works, published in past, using low-dose immunosuppression therapy in order to manage patients afterwards. For presence of infection, could be expected that antibiotics therapy is needed. Our case also showed possible adverse effects of these unusual „combined therapy“ (combined treatment). Some more experience could bring the future, while such complications of aortic aneurysm repair may occur (may be more frequent due to increase in number of abdominal aortic repair).

### Endovascular Management of Aortoenteric Fistula is not a Definite Solution.

*Avgerinos ED 1,2, Psathas E 2, Giannakopoulos T 1, Lioudaki S 2, Kakisis JD 1, Papapetrou A 1, Klonaris C 2, Liapis CD 1*  
 1 Department of Vascular Surgery, Attikon University Hospital, Athens Medical School, Greece  
 2 2nd Department of Propedeutic Surgery, Division of Vascular Surgery, Laiko University Hospital, Athens Medical School, Greece

Endovascular aortoenteric fistula repair (EV-AEFR) has emerged as a less morbid approach, despite the fact that its exact role as a definite or bridge treatment has to be defined, the latter being suggested because of a high incidence of recurrent bleeding and sepsis.

A 66 year old man was referred to our hospital due to fever and episodes of massive rectal bleeding. His past medical history included open abdominal aortic aneurysm repair with a Dacron tube graft, 6 years ago, right lung lobectomy 10 years ago due to lung cancer, hypertension and dyslipidemia. On examination the patient was tachycardic and pale. Hemoglobin was 8.5g/dl and white blood cell count 14.000/mm<sup>3</sup> (79% neutrophils). CT angio revealed a 5 cm infrarenal paraanastomotic aneurysm and an aortoenteric fistula. The anatomic characteristics of the infrarenal aorta were the following: infrarenal neck length 10 mm & neck diameter 34mm, aortic bifurcation diameter 26mm, renal artery to aortic bifurcation length 99mm. As the patient was destabilized, endovascular repair was considered more appropriate, despite the lack of a commercially available endograft to fit the anatomy of the patient. Cook made to us immediately available a custom made tube-graft 38mm diameter 77mm length and the patient was managed successfully by both sealing the aneurysm and controlling the hemorrhage. Intravenous antibiotics were initiated (vancomycin, tazobactam, metronidazole) and patient was discharged under ciprofloxacin tablets and teicoplanin intramuscular injections. One month later the antibiotic regime changed to moxifloxacin monotherapy. The 6-month CT follow up was without evidence of graft infection or AEF and the aneurysm remained sealed, whereas the patient was fit and well. While still on moxifloxacin, one month later the patient developed pseudomembranous colitis. Quinolone was replaced by metronidazole. One month later the patient was transferred to the emergency department shocked due to massive bleeding by both hematemesis and hematochesia. Urgent abdominal CT revealed peri-graft air and with the diagnosis of recurrent AEF, the patient was directed to the operating room. The old graft's proximal anastomosis was disrupted, while the graft itself protruded into the duodenal lumen causing graft-enteric erosion (mucosal bleeding). The endograft was in place preventing aortic hemorrhage. All synthetic material was removed, aorta was sutured, the gut was primarily closed and an axilla-bifemoral bypass was performed. The patient had an unremarkable postoperative course and was discharged 15 days later.

As long as clear conclusions on the ideal candidates for permanent EV-AEFR do not exist, endovascular repair should only serve as a bridging procedure.

### Abdominal Aortic Repair and Inferior Vena Cava Interposition in a Patient with Ruptured Aneurysm.

*Nikolov D, Chervenkov V, Gorcheva D*  
 Clinic for Surgery and Angiology sdova, Mbale Tokuda Bolnitsa Sofia, Bulgaria

Introduction:

We report a case of a ruptured Abdominal Aortic Aneurysm (AAA) with atypical localization of Inferior Vena Cava (IVC), successfully managed with open surgery repair.

Report:

52-year-old male patient with acute abdominal pain and acute left limb pain for two days was presented. Computed tomograph angiography demonstrated ruptured abdominal aortic aneurysm with massive retroperitoneal haematoma and occluded left superficial femoral artery. Additional finding - inferior vena cava (IVC) variant (left-sided infrarenal inferior vena cava, ventrally crossing the aneurysmal neck) supposing difficult clamping. After transection of IVC, AAA was successfully repaired with tube interposition. IVC was also reconstructed with short 20 mm Dacron graft. The patient had an uneventful recovery.

Conclusion:

The case demonstrates the importance of preoperative imaging for successful treatment of ruptured AAA of one anatomical variation and one technical decision for this type of cases.

### EVAR challenging case: Juxta-renal AAA Anatomically Difficult for EVAR, Requiring a Combined Branch and Double Fenestrations

Grewal P, Davis M, Ivancev K. Hamilton G

Royal Free Hampstead NHS Trust, London, United Kingdom

A 76 Yr old male was admitted to a hospital in after feeling unwell. His investigations revealed a low haemoglobin, thrombocytopenia and a possible leaking abdominal aortic aneurysm. CT scan on admission showed a juxta-renal AAA with a para-aortic mass, reported in Cyprus as a possible rupture. The patient self-discharged and flew back to England. On arrival the patient presented to our institution. The CT was re-reported as an AAA with a para-aortic mass suggestive of a soft tissue mass or abscess.

On CT angiogram the neck diameter at the renal arteries was 35mm. The renal arteries origins were at the same level at 11 o'clock and 2 o'clock positions. The SMA origin was at 12 o'clock 5mm above the renal arteries. This made planning a fenestrated EVAR a challenging option. He developed impaired renal function a day after his CT scan, which has remained elevated since. He was assessed by a Consultant Anaesthetist to be unfit for open surgery. MRA confirmed the findings of a AAA and demonstrated a fluid collection with septations and fluid levels in the para-aortic area with vertebral erosions. A diagnosis of chordoma, giant cell tumour and abscess were suggested. CT guided aspiration of this mass/collection yielded some serosanguinous collection which was sterile. He was started on steroids.

Repeat scan in 6 months later showed a significant reduction in the retroperitoneal mass but the L2 and L3 vertebral bodies showed scalloping giving a suspicion of Tuberculosis. Investigations failed to prove this.

Seven months post-presentation he presented with accelerated hypertension, acute confusional state and acute renal failure. Investigations with CT head, MRI brain, MAG3 scan and MRI of Kidneys failed to show any cause for his acute presentation. He recovered but was discharged with chronic renal impairment.

Currently his AAA is 8cm on CT scan. He then presented with shortness of breath on exertion and was diagnosed on V/Q scan to have multiple PE's and treated with anticoagulation. He had started to develop weakness in his legs. Due to his renal impairment a mixture of CO2 and contrast was used for the procedure. A Cook main body 38x140mm was deployed with two renal fenestrations, stented with an Atrium 7x22mm stents. A downward branch was stented into the SMA using a Fluency 9x60mm stent. The main body was then extended with a 24x80mm tube graft. Below this a 24mm bifurcated body was deployed, with a contra-lateral body of 81mm. The contra-lateral limb was extended with a 73x24mm and the ipsi-lateral was extended with a 56x20mm.

A good radiographic appearance was obtained. No evidence of an endoleak. Flow maintained into the SMA, both renal arteries and the common iliac arteries. A follow up CT scan has confirmed patent target vessels and no presence of an endoleak.

### Subclavian TAVI: An Arresting Case.

Griffin KJ 1, Bailey MA 1, Blackman D 2, Scott DJ 1

1Leeds Vascular Institute, Leeds General Infirmary, Leeds, UK

2Yorkshire Heart Centre, Leeds General Infirmary, Leeds, UK

We present the complex case of a 79-year old man who was referred to our institution for aortic valve implantation via a transcatheter approach. The patient had significant cardiac disease with previous coronary artery bypass grafting (x4), paroxysmal atrial fibrillation and severe aortic stenosis with a mean pressure gradient of 38 mmHg and aortic valve area of just 0.7cm<sup>2</sup>. Symptomatically the patient was significantly limited by NYHA class 3 shortness of breath and occasional angina, however his general health was good and hence iliofemoral angiography was performed. This investigation revealed the presence of severe peripheral vascular disease in both iliac vessels precluding a trans-femoral approach, however the left subclavian artery was deemed to be of suitable calibre and the patient was therefore admitted for TAVI.

An infra-clavicular approach with division of pectoralis minor was used to gain access to the left subclavian artery and aortic valvuloplasty was performed under rapid pacing. Immediately post valvuloplasty the patient became profoundly hypotensive with severe aortic regurgitation and the patient arrested on-table. CPR was performed for 13 minutes during which time a 29mm CoreVale prosthesis was rapidly implanted under radiographic control and cardiac output was regained with good recovery of blood pressure.

Post implantation a check angiography showed the valve to be in a good position with only minor regurgitation and confirmed patency of the LIMA-to-LAD vein graft. The subclavian artery was closed by Dacron patch angioplasty with no complications and the patient was recovered to intensive care. Extubation was undertaken later the same day and the patient made an excellent post-op recovery with discharge on day 5.

In this presentation we aim to briefly discuss the subclavian approach to TAVI, the haemodynamic complications associated with TAVI – including so-called "suicide ventricle" – and the intrinsic difficulties associated with resuscitation in a radiology setting.

### From Bell Bottom to the Running Stent. Successful Endovascular Conversion to Hypogastric Branched Endograft.

Mallios A 1, Cochene F 1, Kobeiter H 2, Desgranges P 1

1 Department of Vascular Surgery, Creteil-Paris, France

2 Department of Interventional Radiology, Creteil-Patis, France

Preservation of at least one of the internal iliac arteries during endovascular repair of AAAs is the most common strategy used. Various techniques have been reported for this purpose. Amongst them, the bell-bottom technique involves increased diameter of the endograft's landing zones right before the iliac bifurcation. We report an interesting case of proximal limb migration of a bell-bottom endograft leading to a type I endoleak and successful endovascular treatment with conversion to hypogastric branched configuration.

### Aortoenteric Fistula Treated with EVAR and Duodenum Exclusion.

Berjon J, Romera A, Fernandez E, Gonzalo B, Garcia Ruiz de Gordejuela A, Cairals MA

Hospital Universitari de Bellvitge (Hospitalet de Llobregat, Barcelona, Spain)

Aortoenteric fistula(AEF) after aortic graft surgery is a rare but serious complication that may occur in 0.5–2%. Patients typically present with a gastrointestinal bleeding which may be intermittent and with signs of systemic infection. The diagnosis as well as the treatment of AEF can be quite challenging. Computed tomography angiography(CTA) is considered the cornerstone for diagnosis. Surgical treatment is always recommended. The choice of surgical repair is still controversial. Conventional treatment consists of extensive open surgery which includes aortic ligation and complete removal of the prosthetic material, extra-anatomic bypass and closure of fistula tract. This treatment is associated with high morbidity and mortality (30–95%) and therefore minimally invasive options with endovascular repair have been attempted.

We report a case of a 70 year old male who was admitted in our institution and presented with gastrointestinal bleeding and history of an aortobiliac graft two years ago. CBC showed leucocytosis and in the CTA a fistula between proximal anastomose of the graft and the third portion of the duodenum was diagnosed. Surgery was scheduled in the next week, but because of abrupt bleeding with haemodynamically instability emergent surgery was required. Because of obesity and a poor condition of the patient, we decided to perform minimally invasive surgery, with the implantation of an aortouniiliac endoprosthesis and a femorofemoral bypass graft. General Surgery performed closure of duodenum and its exclusion with a gastrojejunal Roux anastomoses. We also made revision and wide debridement of abscess found, and cultivated samples.

Patient outcome was satisfactory, broad antibiotic therapy was given and adjusted by antibiogram of cultures. No signs of sepsis nor persistent infection were shown.

This case illustrates the potential for endovascular therapy combined with wide infection treatment and duodenum exclusion as an alternative to the aggressive standard surgery, which could be a final therapeutic option, especially in elderly patients with multiple morbidities and short life expectancy.

### Permanent Cava-Filter Embolisation and Migration in Patient with Pulmonary Embolism and Deep Vein Thrombosis During Pregnancy.

*Khrebtiy YV, Skupyy OM, Mitiuk OI*

Vynnytsa Regional Hospital, Vynnytsa, Ukraine

The patient is a 26-year-old woman 32 weeks pregnant (second pregnancy). In October 2010, the patient appeared at the clinic with symptoms of pain, cyanosis, and edema of the left lower extremity which disturbed the patient for 14 days. Symptoms of tachycardia, shortness of breath had begun to disturb the patient 5 days ago.

During duplex ultrasound(DU), hyperechogenic floating thrombus of the left vena femoralis communis(VFC) was diagnosed. Echocardiography showed pulmonary hypertension of II stage, dilatation of right part of heart. During spiral CT of thoraces pulmonary embolism of the right pulmonary artery was diagnosed. The temporary cava filter was inserted. The patient was treated with enoxaparinum in a dose of 1 mg/kg every 12 hours, elastic compression stockings(ECS). Patient was operated with removing of floating part of thrombus of the left VFC. Echocardiography after treatment showed regress of pulmonary hypertension and absence of dilatation of right part of heart. DU and phlebography after treatment showed embolus of temporary cava filter. A permanent cava filter was implanted. The temporary cava filter was removed with open access to right VFC. The thrombotic masses were diagnosed at the temporary cava filter. During operation the migration of permanent cava-filter in right VFC was diagnosed. Permanent cava-filter with thrombotic masses was removed. DU after treatment showed complete recanalisation of left VFC and vena femoralis superficialis. After this, the patient would be treated with enoxaparinum in dose of 40 mg every 24 hours during the antepartum period and ECS.

The woman successfully gave birth to a healthy baby girl with weight 3,500 g. DU in postpartum period showed a complete recanalization of the left femoro-popliteal venous segment. Echocardiography in postpartum period showed absence of pathology. The patient was then prescribed long-term Warfarin therapy with regular control INR level (2.0-3.0) and ECS.

### Graft in Duodenum – An Extremely Rare Report of Complete Disconnection of Aortic Graft and Migration into the Duodenum.

*Jha PK, Wilson YG*

Norfolk & Norwich University Hospital, United Kingdom

A 65 year old smoker presented to the A&E department with a 2 week history of abdominal pain with malaena, and 1 week of low grade fever. He was haemodynamically stable; had soft abdomen and ischaemic right leg (only remaining limb).

He had a complex past vascular surgical history:

Aorto-bi-femoral bypass(ABF) for occluded infra renal aorta 10years ago.

Infection and thrombosis of left limb of ABF(diverticular disease) managed by excision and femoro-femoral cross over bypass 1year after initial operation.

Blocked aortic graft after 5years managed by axillo-bi-femoral bypass but unsalvageable critical ischaemia of left side led to above knee amputation.

Blocked axillo-bi-femoral bypass, failed to open after thrombolysis 2years ago but viable right leg.

A CT scan showed duodenum to be tethered to the underlying aortic graft and GI endoscopy showed foreign material in the duodenum. An aorto-enteric fistula was diagnosed and urgent laparotomy was performed. At laparotomy, there was complex adhesion of the duodenum to the retroperitoneum. The aorta and the renal arteries could not be identified due to dense fibrous adhesions. Aorta was clamped through the lesser sac. During dissection the third part of duodenum was breached and the aortic graft was found to lie free within the lumen. Duodenotomy was extended and the graft was excised to as distal limit as possible. Duodenotomy was closed primarily with drains placed around the site. He recovered and is under follow up with an ischaemic but viable right leg.

This is an extremely rare report of such an extensive aortic graft disconnection and migration into the duodenum. This case shows the potential serious and long term complication of aortic graft infections.

The management options although limited in our case, remains excision of the aortic graft with an axillo-bi-femoral bypass, either at the same sitting or in a staged fashion.

## ESVS PREVIOUS PRIZE WINNERS

2002

**SR Vallabhaneni (best clinical paper)**  
**Title** Aortic side branch perfusion alone does not account for high intra-sac pressure after endovascular repair in the absence of graft-related endoleak.  
**From** Regional Vascular Unit, Royal Liverpool University Hospital, United Kingdom

**OE Teebken (best experimental paper)**  
**Title** Tissue-engineered bioprosthetic venous valve: a long term study in sheep.  
**From** Division of Thoracic and Cardiovascular Surgery, Hanover Medical School, Germany

2003

**V Pandey (best clinical paper)**  
**Title** The European Board of Surgery Qualification in Vascular Surgery (EBSQ-VASC): validity of a pilot assessment in technical skill.  
**From** European Board of Vascular Surgery

**A Migdalski (best experimental paper)**  
**Title** Selected haemostatic factors in carotid bifurcation plaques of patients undergoing carotid endarterectomy  
**From** Department of Surgery, L Rydygier Medical University, Bydgoszcz, Poland

2004

**J Reid (best clinical paper)**  
**Title** The Effect of Pravastatin on Intima Media Thickness of the Carotid Artery in Patients with Normal Cholesterol  
**From** Belfast City Hospital, Northern Ireland

**J Heckenkamp (best experimental paper)**  
**Title** Radiation Therapy Induced Modulation of Wound Healing at Experimental Vein Graft Anastomoses  
**From** University of Cologne, Germany

## ESVS PREVIOUS PRIZE WINNERS

2005

**Sarah Franks (First Prize)**  
**Title** A Meta-Analysis of 12 years of Endovascular Infra-Renal Aortic Aneurysm Repair  
**From** Leicester Royal Infirmary, Leicester United Kingdom

**Sandro Lepidi (Second Prize)**  
**Title** Hyaluronan-based temporary scaffold for in vivo regeneration of small diameter (2mm) arteries  
**From** Department of Cardiac, Thoracic and Vascular Sciences, University of Padova, Padova Italy

2006

**Bart Muhs (First Prize)**  
**Title** Dynamic Cine-CT Angiography for the Evaluation of the Thoracic Aorta; Insight in Dynamic Changes With Implications for Thoracic Endograft Treatment.  
**From** Cooperation between The New York University, and University of Utrecht, USA and The Netherlands

**Tiffany Hassen (Second Prize)**  
**Title** Pre-Operative Nutritional Status and the Development of Systemic Inflammatory Response Syndrome and Sepsis Following Major Vascular Surgery  
**From** University of Adelaide, Australia

**Andreas Greiner (Prize for Poster Session)**  
**Title** The Impact of Isolated Aorto-Iliac Lesions on the High Energy Phosphate Metabolism in the Exercising Calf Muscle  
**From** Innsbruck Medical University, Austria

## ESVS PREVIOUS PRIZE WINNERS

2007

**Title** Joseph Dowdall (1st prize)  
Mitigating Proximal Component Migration in Branched Endografts With Modular Joints - Benefit Or Calculated Risk?  
**From** Cleveland Clinic Foundation, Cleveland, USA

**Title** Liselott Hoornweg (2nd prize)  
Selection of Patients Anatomically Suitable for Endovascular Repair of a Ruptured Abdominal Aneurysm: Inter- and Intraobserver Variability of CT Measurements  
**From** Academic Medical Center, Amsterdam, The Netherlands

**Title** DHL Lee (Poster prize)  
Randomised Trial of Supervised Exercise Versus Angioplasty Versus Combined Therapy: Patients Undergoing Exercise Therapy Adapt to Oxygen Free radical Damage  
**From** Academic Department of Vascular Surgery, University of Hull; Leeds Institute of Molecular Medicine, University of Leeds, United Kingdom

2008

**Title** N Dias (1st prize)  
**From** Is There Benefit of Frequent CT Follow-up After EVAR? Vascular Center Malmö-Lund, Malmö University Hospital, Malmö, Sweden

**Title** J Richardson (2nd prize)  
Results of Transabdominal Repair of Extent IV Thoracoabdominal aneurysms  
**From** Vascular Surgical Service, Royal Infirmary of Edinburgh, United Kingdom

**Title** C M Kotze (Poster prize)  
Abdominal Aortic Aneurysm Inflammation Detected by 18F-fluorodeoxyglucose (18FFDG) Positron Emission Tomography/Computed Tomography (PET/CT)  
**From** Brighton & Sussex University Hospitals NHS Trust, United Kingdom

## ESVS PREVIOUS PRIZE WINNERS

2009

**Title** Sebastian Amiot (1st prize)  
An Analysis of The French Multicentre Experience of Fenestrated Aortic Endografts: Medium-term Outcomes  
**From** Centre Hospitalier et Universitaire de Lille, France

**Title** Jasper van Keulen (2nd prize)  
The Influence of Different Types of Stentgrafts on Aneurysm Neck Dynamics after Endovascular Aneurysm Repair  
**From** UMC, Utrecht, The Netherlands

Design:

Haywards, Alston, Cumbria, CA9 3JU, UK

t: +44 1434 382148

e: [studio@haywards.com](mailto:studio@haywards.com)

w: [www.haywards.com](http://www.haywards.com)

Print:

Gamma Printing House

7 & 9, Evryviadou str., 546 38 Thessaloniki, Greece

t: +30 2310 926629

e: [info@gamma.gr](mailto:info@gamma.gr)

w: [www.gamma.gr](http://www.gamma.gr), [www.gammaeditions.gr](http://www.gammaeditions.gr)

Published by:

The European Society for Vascular Surgery

September 011

Please note:

All details are correct at time of going to press (26 August 2011) but may be subject to change.