

**Presentation  
Number:** P1

**Publishing  
Title:** **Does the late mortality rate justify EVAR in high risk abdominal aortic aneurysm patients?**

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**Does the late mortality rate justify EVAR in high risk abdominal aortic aneurysm patients?**

**Objectives:** The development of endovascular aneurysm repair (EVAR) has enabled treatment of more elderly, high-risk patients with abdominal aortic aneurysms who could not tolerate open surgery. We sought to quantify the impact of comorbid conditions on the late mortality of patients who underwent EVAR at our institution in order to assess whether this procedure is warranted in these more high-risk patients.

**Methods:** Through a retrospective review of the electronic medical records of 105 consecutive patients who underwent EVAR, we calculated the incidence of new diagnoses in prospective surveillance for renal, cardiovascular, cerebrovascular, pulmonary, and neoplastic disease as well as all-cause mortality.

**Abstract  
Body:**

**Results:** At an average age of 72 at operation, the most frequent condition to arise postoperatively was renal disease at 28.5%, defined as an increase to stage III or worse chronic kidney disease. Only two patients, however, required dialysis. Cancer, including skin cancer, occurred in 19%. Pulmonary disease leading to hospital admission or death occurred in 17%.

Cardiovascular disease, defined as the incidence of myocardial infarction, hospital admission for worsening heart failure, or catheterization with intervention, had an incidence of 11.4%. Cerebrovascular accident occurred in 2.8%. The all-cause mortality rate was 30.5% over an average follow up of 39 months. By comparison, aneurysm or graft-related complications, primarily type II endoleak, occurred in 22% with 11 (10.5%) requiring intervention. We found no confirmed aneurysm-related mortality.

**Conclusions:** Our data demonstrate that EVAR is warranted in high risk, elderly patients and highlight the importance of management of chronic pulmonary disease and surveillance for malignancy in order to maximize survival after EVAR.

**Presentation  
Number:** P2

**Publishing  
Title:** Resident Views on Vascular Ultrasonography Education: A Canadian Perspective

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**OBJECTIVE:** With the requirement to obtain RPVI certification as of 2014 in American vascular surgery programs, formal vascular ultrasound (VUS) training is expected in vascular surgery training. Canadian programs, however, do not have the same credentialing requirements and not all programs require or offer formal VUS training. We, therefore, sought to determine whether Canadian trainees desire additional VUS training, how this training should be delivered and what role they see VUS playing in their future practice.

**METHODS:** An online questionnaire was sent to all residents and fellows in vascular surgery programs in Canada. Quantitative data was analyzed with Microsoft Excel ®. Qualitative data was analyzed for common themes.

**RESULTS:** 20 out of 50 trainees (40%) surveyed completed the survey, with 9 of 10 schools (90%) represented. 19 of 20 (95%) indicated being either “interested” or “extremely interested” in VUS. Most anticipate that VUS will play a large role in their future practice, including the being able to understand/interpret VUS data and images (90%), practicing as an interpreting physician (90%), acting as lab medical director (75%), physically performing scans (75%), and owning/operating a vascular lab (75%). Additionally, most respondents plan on obtaining (60%) or have already obtained (10%) RPVI certification, while only 30% plan to obtain RVT certification.

**Abstract  
Body:**

Most trainees have obtained some informal VUS training (75%); 45% have had formal VUS training in some format. Onsite training (30%), specialty rotations (25%), and e-learning (10%) were less common resources. Most (80%) indicate that they have not had enough exposure to VUS in their training, thus far. Most (95%) also see a need for additional VUS training resources, with hands-on training (100%) and interactive modules (68%) being the preferred modalities. Didactic lectures (26%), videos (26%) and textbooks (16%) were seen as less favourable resources.

**CONCLUSION:** There is a strong interest in vascular ultrasonography among current trainees; however, there is a need for additional training resources. In response to this, the planning of the CSVS Vascular Ultrasound Curriculum is currently underway.

**Presentation  
Number:** P3

**Publishing  
Title:** Endovascular Management of Ascending Aortic Pseudoaneurysms

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**OBJECTIVES:** To describe successful endovascular management of two ascending aortic pseudoaneurysms, provide short term follow up data, and review the available literature.

**METHODS:** One patient previously had two aortic valve replacements for endocarditis and was found to have a 7.2 cm pseudoaneurysm and was deemed inoperable. The second patient had a previous CABG/AVR and was incidentally found to have a 1.8 cm pseudoaneurysm on surveillance CTA to follow an AAA. Both patients received high resolution thin cut CTA for optimal procedural planning including the size of the defect, relative position to the coronary arteries, arch vessels and aortic valve. Both pseudoaneurysms were repaired with Amplatzer II plugs from a percutaneous right brachial artery approach to minimize wire manipulation in the aortic arch and stroke risk. A MEDLINE search was performed to evaluate the previous experience with plugs and septal occluder devices in the ascending aorta to compare with reported mortality with open repair.

**Abstract  
Body:**

**RESULTS:** Both procedures were successful with no intraoperative or perioperative complications. One patient is alive and well ten months later with continued complete occlusion of the pseudoaneurysm neck and near resolution of the pseudoaneurysm cavity. The second patient obtained an excellent result from the procedure with complete occlusion of the pseudoaneurysm; however, he expired 37 days after the procedure due to complications of chronic respiratory failure. Previous reports (n=18) of various closure devices demonstrated 89% procedural success and 1 death during attempted retrieval of a dislodged device.

**CONCLUSIONS:** Percutaneous closure may be an effective alternative to surgery for ascending aortic pseudoaneurysms, particularly in patients with severe comorbidities portending unacceptable risk of morbidity and mortality with median sternotomy. Continued surveillance is necessary to determine the durability of these repairs.

**Presentation Number:** P4

**Publishing Title:** Systematic Review of the Comparative Effectiveness of Surgical Interventions Aimed at Treating Underlying Venous Pathology in Patients with Chronic Venous Ulcer.

**Mahmoud Malas, MD, Umair Qazi, MD, MPH, Gerald Lazarus, MD, M. Fran Valle, Lisa M. Wilson, M.Sc, Elisabeth B.**

**Author Block:** Haberl, Eric B. Bass, MD, MPH, Jonathan Zenilman, M.D.

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**Objectives:** Multi-layer compression dressings are the treatment gold standard for Chronic Venous Ulcers (CVU). Multiple surgical procedures are used to correct the underlying venous pathology but there is no consensus about their efficacy. As part of a larger review, our Evidence-based Practice Center performed a systematic review comparing the effects of surgical therapies for treating CVU on wound-healing rates, time to healing, recurrence rates, mortality, pain, and quality of life.

**Methods:** We searched MEDLINE®, EMBASE®, Cochrane Central Register for Controlled Trials, and Cumulative Index for Nursing and Allied Health Literature databases from 1980 to 2012. We included studies comparing a surgical procedure with multi-layer compression therapy or another surgical procedure. We also included studies without a comparison group. Two independent reviewers screened titles, abstracts, and articles for eligibility, extracted data on study design, applicability, and quality, and graded the strength of the evidence (SOE) after collating the data.

**Results:** We reviewed 10,676 citations. We included 22 studies. Eight studies (6 randomized controlled trials {RCT}, 2 cohorts) compared a surgical procedure with compression. Fourteen studies evaluated different surgical interventions.

Adding superficial vein ligation and stripping to compression did not improve wound-healing rate (2 RCTs, RR 0.96, 95% CI, 0.96-1.02). Recurrence rate was reduced by 50% when surgery corrected the underlying venous pathology (p<0.01, moderate to high SOE). Adding subfascial endoscopic perforator surgery (2 RCTs) with superficial vein surgery to compression did not improve the healing rate or reduce recurrence rate except for medial and ulcers >2.5cm (HR 0.79, 95% CI, 0.45-1.39, high SOE).

The SOE was insufficient to support a conclusion about:

1. Effects of sclerotherapy when added to compression
2. Surgical treatment for deep venous reflux and venous obstruction
3. Effects of surgical procedures on mortality, pain, and quality of life.

**Conclusion:** Our ability to draw conclusions on most surgical techniques was limited due to poorly designed and executed studies, with no uniformity of treatment methods, limited follow-up, poor reporting, and lack of randomization.

We found some evidence to suggest superficial vein ligation and stripping may reduce the risk of wound recurrence, but these techniques are rarely practiced.

The newer minimally invasive techniques lack strong evidence of efficacy. RCTs are needed to determine the efficacy and safety of current endovenous procedures for treating CVU.

**Abstract Body:**

**Presentation Number:** P5

**Publishing Title:** **Content, Accuracy and Completeness of Patient Consent in a Regional Vascular Centre**

**Author Block:** **Mark E. O'Donnell, MMedSc MD FRCS**, Damian McGrogan, MB MRCS, David Mark, MB MRCS, Bernard Lee, FRCS. Belfast City Hospital, Belfast, United Kingdom.

**OBJECTIVES:** Although there are published guidelines for procedural consent, there is evidence to suggest that deficiencies still occur with recording of patient demographic data, documentation of procedural risks and information regarding alternative therapies. We assessed the accuracy and completeness of vascular consent within our unit.

**METHODS:** A retrospective review of patients undergoing vascular intervention between February 2010 and February 2011 was performed. Chart reviews included the analysis of consenting doctors' seniority, responsible vascular attending, completeness of procedural entry, documentation of correct side, use of abbreviations, discussion of benefits and complications, additional information and overall legibility. Interpretation of consent documentation and overall legibility was performed using CRABEL scoring model for medical record assessment.

**RESULTS:** 323 patient consent forms were reviewed (male=203, mean age 68.0 years, elective surgery=241) including 50 AAA repairs, 27 carotid endarterectomies, 88 peripheral arterial reconstructions, 96 amputations and 69 elective varicose vein surgeries. 294 (91%) consent forms were completed by a senior resident or above with 286 (88.5%) forms having the responsible attending documented. 85.4% of patients were consented within 48 hours of surgery. 245 (75.9%) consent forms had legible printed names. However, only 75 (23.2%) had a legible signature. 306 (94.7%) consent forms had the procedure documented in full but 165 (51.0%) had used abbreviations. 103 (31.9%) had documentation of the intended benefits of surgery whilst 293 (90.7%) had documentation of potential complications. 3 patients had documented evidence of receiving written information and 1 patient received a copy of the consent form. Of those surveyed, procedural mortality was discussed in 97% of open and 94% of endovascular AAA repairs. Stroke was documented in 96% of consent forms for carotid endarterectomy. Scarring was included most commonly in patients undergoing venous procedures. CRABEL scores for completion of name and hospital number were 98.1%, full operation documentation 94.7%, risks/complications 90.7% and provider signatures 99.9% for all completed consent forms.

**Abstract Body:**

**CONCLUSIONS:** Vascular consent is a complex process involving a number of discussions and meetings with patients. Our unit has demonstrated compliance of nearly 90% for all consent related processes and remains consistent with current published guidance. However, further improvement including the documentation of intended benefits, provision of additional written information whilst reducing the use of abbreviations is desired.

**Presentation Number:** P6

**Publishing Title:** **Incidence of Ruptured Abdominal Aortic Aneurysms Has Decreased Significantly in the Last Decade: A 30-Year Population Based Study**

**Author Block:** Amanda J. Kravetz, MD, Manju Kalra, MBBS, Audra Duncan, MD, Thomas C. Bower, MD, Gustavo Oderich, MD, Mark Fleming, MD, William S. Harmsen, MS, Peter Gloviczki, MD.  
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**Abstract Body:**

**OBJECTIVES:** Adoption of screening for and dissemination of endovascular repair of abdominal aortic aneurysms (AAA) has led to an increase in the number of elective aneurysm repairs. The aim of this study was to assess whether these measures have affected the incidence of rupture of abdominal aortic aneurysms (rAAA) in a defined population.

**METHODS:** A retrospective, population-based study was conducted with review of medical and death records of consecutive patients identified using ICD9/CPT codes for ruptured AAAs over a 30 year period from 1980 - 2010. The rupture rates were adjusted using the United States 2010 census data.

**RESULTS:** A total of 100 patients were identified; 79 males and 21 females. Median age at rupture was 75 years (range 55-101). Rupture was diagnosed at autopsy in 15 patients. Twenty-three patients had known AAAs; median time from diagnosis to rupture was 4.0 years (range 4 days - 12.6 years). Median aneurysm diameter at rupture was 6.9 cm (range 4-11). Repair was attempted in 73 patients (open - 71, endovascular - 2). There were 8 intra- and 11 post-operative deaths for a 30 day operative mortality of 26%. There were 5 further in-hospital deaths for an overall mortality of 51%. 67.1% (49/73) patients in whom repair was attempted left the hospital alive. Cumulative survival at 5, 10 and 15 years in the entire study cohort were 34%, 23% and 13% respectively; in survivors of rAAA repair were 55%, 37% and 22% respectively. No further aneurysm-related deaths were identified in follow-up. The age- and sex-adjusted incidence of rAAA was significantly lower in the 2000s (2.1 per 100,000 person years) compared to 8.0 in the 1990's and 7.9 in the 1980's, ( $p < 0.001$ ). The age-adjusted incidence for females in the 2000s, 1990s and 1980s (0.8, 1.6 and 3.2 respectively) was significantly lower than that for males (3.7, 16.0 and 13.8 respectively).

**CONCLUSIONS:** The incidence of ruptured abdominal aortic aneurysms decreased significantly during the last decade. This is likely a combination of easier identification by screening and widespread imaging as well as extension of elective repair to patients previously considered too high risk for repair. Further studies are needed to evaluate the incidence of AAA prevalence and elective repair in the same population over the same time period.

**Presentation Number:** P7

**Publishing Title:** Outcomes After Endovascular Aortic Aneurysm Repair (EVAR) Compared With Open Surgical Repair For Ruptured Abdominal Aortic Aneurysms (rAAA) In A Contemporary National Registry

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**OBJECTIVES:** Recent studies report conflicting evidence about the utility and survival advantage of EVAR over traditional open surgical repair for ruptured abdominal aortic aneurysms (rAAAs). In this study we examine the short-term outcomes of both methods in a national registry.

**METHODS:** All open and EVAR repairs from 1/1/2010 through 12/31/2011 recorded in a national registry of a community-based integrated health care system were retrospectively reviewed. Cases of rAAA were further analyzed. Mortality rates at 30 days and at 1 year for open repair and EVAR were compared via chi-square test or Fisher's Exact Test. Rates of reinterventions and overall complications were calculated for each group.

**Abstract Body:** **RESULTS:** During the two year study period, 1380 AAA repairs were performed, 358 by open repair and 1022 by EVAR. There were 124 rAAA cases, of which 90 were repaired open and 34 by EVAR. 12 of the 34 ruptures repaired by EVAR were performed outside of instructions-for-use guidelines. 30 day mortality was significantly higher in the open rupture group (45.6%) compared with the EVAR group (17.7%, p=0.004). One year survival was 61.8% in the EVAR group and 50.0% in the open surgical group, but this did not reach significance, (p=0.24). There were more perioperative complications seen in the open surgery group, 40.0% vs. 20.6%, (p=0.04). Mean length of stay and reintervention rates did not differ significantly between the ruptured open and EVAR groups (11.1 vs. 7.9 days, p=0.74; 8.9% vs. 14.7%, p=0.34, respectively).

**CONCLUSIONS:** In a contemporary national registry experience, endovascular repair of rAAA is associated with improved 30 day survival but not one year survival compared with open repair with lower short-term complication rates but similar reintervention rates. Most rAAAs continue to be repaired with an open technique. While the short term results of rAAA repair with EVAR are excellent, more study is needed to determine optimal treatment options and predictors of long-term survival.

**Presentation Number:** P8

**Publishing Title:** **Brachiocephalic vein bypass with sternal reconstruction for symptomatic occlusion**

**Author Block:** **Mark E. O'Donnell, MMedSc MD FRCS**, Dawn Jaroszewski, MD, Kathryn Coan, MD, Grant Fankhauser, MD, William M. Stone, MD, Richard J. Fowl, MD, Francis J. Kazmier, MD, Samuel R. Money, MD. Mayo Clinic, Phoenix, AZ.

**Abstract Body:**

**OBJECTIVES:** Complications attributed to central venous stenosis and subsequent thrombosis are increasing in frequency and are most commonly associated with neointimal fibroplasia from venous access procedures as well as neoplastic, fibrotic, and traumatic pathologies.

**METHODS:** We present the successful venous bypass and thoracic wall reconstruction in a patient with chronic atypical symptomatology secondary to brachiocephalic vein occlusion from congenital thoracic dystrophy.

**RESULTS:** A fifty-eight year-old female presented with deteriorating holocephalic retro-orbital exertional headaches associated with intermittent vertigo, neck and shoulder discomfort combined with bulging of her left sided neck veins. She had no previous venous thromboembolic disease, venous access catheters or trauma. A contrast-enhanced CT angiogram identified significant narrowing of the left brachiocephalic vein between the sternum and descending thoracic aorta. Venography confirmed a filling defect in the left brachiocephalic vein and normal patency of the other great veins. She described consistent short-term relief after multiple percutaneous brachiocephalic vein thrombolysis, angioplasty and stenting procedures. Repeat CT imaging suggested extrinsic compression of the previously inserted brachiocephalic stent. After referral to vascular surgery, it was determined that operative decompression and venous bypass was warranted due to extrinsic pressure due to pectus excavatum. In order to expand the diameter of the upper chest, the upper manubrium, clavicle, sternum and ribs were released from scar tissue and the pectoralis muscles were elevated. Multiple transverse rib and sternal osteotomies combined with excision of the left first and second ribs were performed to elevate the chest wall. A 3-4 cm chest wall hernia was subsequently closed with XCM biologic tissue matrix<sup>®</sup>. The right great saphenous vein was endoscopically harvested and used to construct a spiral graft to bypass the left brachiocephalic vein between the junction of the left internal jugular and brachiocephalic vein to the SVC. The chest wall was reconstructed utilizing titanium plating and FiberWire<sup>™</sup> to reattach the ribs and manubrium to the elevated sternum. Bilateral autologous semitendinosus grafting of clavicles to manubrium was then performed. Post-operatively, the patient had an uneventful recovery and remains well seven-months later.

**CONCLUSIONS:** Although acute central vein obstruction warrants urgent intervention, treatment of chronic occlusions remain less descript. Despite reported equivocal results between operative intervention and repeated angioplasty, open brachiocephalic vein bypass is suggested for longer term relief in patients with any etiological anatomical compression.



**Presentation Number:** P9

**Publishing Title:** **Multidisciplinary Care Includes Endovascular Abdominal Aortic Aneurysm Repair (EVAR) for Cancer Patients and Survivors in a Tertiary Referral Cancer Center**

**Tam T. Huynh, M.D.**<sup>1</sup>, Steven Y. Huang, M.D.<sup>2</sup>, Reza Mehran, M.D.<sup>2</sup>, Kamran Ahrar, M.D.<sup>2</sup>.

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**OBJECTIVES:** Advances in oncologic treatment and endovascular therapy have led to parallel improvement in patient outcome. However, the management of large abdominal aortic aneurysm (AAA) in cancer patients remains controversial. We conducted this study to determine the outcome of patients with AAA undergoing EVAR either prior to or after cancer treatment.

**METHODS:** Retrospective study of consecutive patients who underwent EVAR for non-ruptured aorto-iliac aneurysm > 5 cm in a tertiary referral cancer center between 09/2010 and 08/2013. Patient demographics, procedure-related complications, length of hospital stay, interval time to cancer treatment, and 30-day and intermediate-term outcome were reviewed.

**RESULTS:** Twenty patients had EVAR and median follow-up was 15 months (range: 1- 33). All patients were male, either current or former tobacco smoker (mean 50 pack-years), with median age, 71.5 year-old (range 58-79). Fifty percent of the patients had hypertension, 40% COPD, and 35% coronary artery disease. Thirteen patients had active cancer, and 7 were in remission for at least 6 months (types of cancer: 10 bronchogenic, 6 lymphoma/melanoma, 2 gastric, 1 prostate and 1 laryngeal). Median AAA size was 5.8 cm (range: 5.2-8.8). EVAR was successful in all patients. The initial 3 patients had femoral artery cut-down, and the remaining 17 had totally percutaneous access. The median length of hospital stay was 1 day (range: 1-5). All patients survived at 30-days post-EVAR. Access complications occur in 2/20 (femoral pseudoaneurysms). There were 6 endoleaks (type II); 4/6 resolved. The mean % of AAA diameter reduction was 19% at one- and 29% at 2-years. Mean interval time to begin or resume oncologic treatment was 26 days after EVAR (8-48). Six patients died while undergoing cancer treatment (4/6 had advanced lung cancer, 1/6 had sudden death, and 1/6 died of complications from gastrectomy). Fourteen patients are currently alive (figure).

**Abstract Body:**

**CONCLUSIONS:** Our study shows that EVAR is effective and safe in cancer survivors and patients undergoing active oncologic treatment. Prognosis was related to oncologic type and stage (worse in advanced lung cancer). Based on our results, we advocate that EVAR be part of the multidisciplinary strategic treatment plan for cancer patients with large AAA.

**Presentation  
Number:** P10

**Publishing  
Title:** **Contemporary Management of Radiation-Induced Ilio-femoral Arterial Occlusive Disease in a Cancer Survivors**

**Author Block:** **Tam T. Huynh, M.D.**, Steven Y. Huang, M.D., Judy Ahrar, M.D., Reza Mehran, M.D., Kamran Ahrar, M.D.,  
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**Objectives:** Advances in therapeutic radiation techniques have been shown to improve patient survival and lessen associated side-effects. We conducted this study to evaluate the current treatment options for radiation-induced ilio-femoral arterial occlusive disease in cancer survivors.

**Methods:** We retrospectively reviewed consecutive patients who presented for treatment of radiation-induced ilio-femoral arterial occlusive disease in a tertiary referral cancer center between 07/2010 and 08/2013. Patient demographics, procedure-related complications, and 30-day and intermediate-term outcome were reviewed.

**Abstract  
Body:**

**Results:** Ten patients had ilio-femoral arterial occlusive disease after radiation treatment (7 women), with median age, 55 year-old (range 39-72). Median follow-up was 14 months (range: 1- 36). Three patients were active smokers, 3 former and 4 never smoked. Two patients had non-insulin diabetes. Nine patients presented 3 years or more after completing radiation treatment (median interval was 8 months; 7 with rest pain or non-healing wound, 2 disabling claudication), and 1 had acute limb-threatening ischemia when completing radiation. Two most common types of cancer were: cervix (4), anal canal (2); other (4). Four patients had endovascular revascularization, 3 surgical bypass, 2 hybrid interventions, and one on medical therapy.

Revascularization was successful in 9/9 patients and all survived at 30-days. No patient required amputation. One patient died at 20 months after revascularization from chronic relapsing infectious complications related to her oncologic surgery. Two patients who had iliac stenting required successful re-interventions at 12 and 18 months (both were active smokers).

**Conclusion:** Our study shows that most cancer survivors with radiation-induced ilio-femoral arterial occlusive disease present several years after radiation treatment and have good outcome following either endovascular or surgical revascularization.

**Presentation Number:** P11

**Publishing Title:** Imaging Handling in Presentations at Vascular Meetings: Do We Have a Vision?

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**OBJECTIVES:** Most presentations at academic meetings are accompanied by “slides” presented in PowerPoint® format. Vascular presentations frequently include images of clinical material, diagnostic imaging (CT, MRI, U/S, etc.) or operative findings. Optimized images are important to clear understanding of material presented. This study aims determine whether current presentation materials included clear, optimized images, and what common flaws could be identified in small, medium and large meeting settings. We analyzed findings and related literature to identify practical image optimization strategies.

**METHODS:** A validated audit tool was applied to assess image handling in 100 presentation in each of small (100) vascular meetings; presenters ranged from novice to expert. Specific domains and elements relevant to image optimization were audited in each presentation and correlated to the overall quality of the presentation. A structured literature review was performed to address theory, study results and ‘advice’ relevant to the topic.

**Abstract Body:**

**RESULTS:** Patterns of audit results were no different with respect to meeting size. There was a trend, however, to better results with experienced presenters. Common flaws included: aim of image was unclear (20%); image not optimized to aim (50%); inclusion of hospital, clinic or manufacturer identifiers (70%). Technical flaws included: poor cropping (50%); small size (60%); unsharp focus (20%); suboptimal contrast (40%) and brightness (70%). Appropriate labelling was often poorly executed (20%) or absent altogether (75%). The correlation of these findings with literature review of design theory, previous studies and published “advice” allowed the identification of 10 tips to optimized images for presentation. These include 1. Technical (contrast, brightness, focus), 2. Size (cropping, resizing, background), 3. Labels (color, size) and 4. Identifiers (sources, privacy).

**CONCLUSIONS:** Presentation quality and impact can be related to effective image use. Image handling in vascular presentations is suboptimal. The identified concerns and documented flaws can be rectified by applying theory and recognized practice to optimize images.

**Presentation Number:** P12

**Publishing Title:** **Risks and outcomes of postoperative cardiac arrest after vascular surgery: defining the evidence for informed discussions of code status and goals of care**

**Author Block:** **Jeffrey J. Siracuse, M.D.**, Ellen C. Meltzer, M.D., Heather L. Gill, M.D., Ashley R. Graham, Darren B. Schneider, M.D., Peter H. Connolly, M.D., Andrew J. Meltzer, MD  
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**Introduction:** Despite emphasis on incorporating “code status” into pre-operative informed consent discussions, the risks and outcomes of cardiopulmonary resuscitation (CPR) for vascular surgery patients who suffer cardiac arrest (CA) remain poorly defined. We sought to identify risk factors and define outcomes for post-operative CA requiring CPR in patients undergoing vascular surgery, to provide an evidence base for informed consent discussions and implementation of perioperative “do not resuscitate” (DNR) orders.

**Methods:** 2007-2010 American College of Surgeons National Surgical Quality Improvement Project (ACS-NSQIP) public utilization files were utilized to develop a multi-institutional database of patients undergoing vascular surgery (N=123,621). Univariate analyses identified risk factors associated with post-operative CA requiring CPR and assessed outcomes of resuscitation. Multivariate logistic regression models were developed for post-operative CA requiring CPR and resuscitation outcomes.

**Results:** Post-operative cardiac arrest requiring CPR was seen in 1236 of 123,621 (1.0%) patients after vascular surgery at a mean of 7.2 (median 4) days. 30-day mortality was 73.4% compared to 2.7% among patients who did not experience this adverse outcome (P<.001). Patient characteristics independently associated with post-operative CPR are shown (Table 1). Procedures associated with the highest risk included thoracic aortic surgery (OR 6.9, [95% CI: 4.8-9.9]; P <.001), open abdominal procedures (3.7, [3.1-4.4]; P <.001), axillary-femoral bypass, (2.1 [1.3-3.2]; P=.001), and peripheral embolectomy (1.5 [1.2-1.9]; P=.002). At least one major complication preceded cardiac arrest in 47.7% of patients including sepsis (23.5%), renal failure (14.5%), and myocardial infarction (12.1%). Patients with DNR orders were significantly less likely to undergo CPR (0.59 [0.39-0.93]; P=0.021). Of CPR survivors, 102 (12.1%) were still hospitalized at 30 days.

**Discussion:** Informed consent necessitates patients and surrogates understand the risks and outcomes of procedures, including the risk of post-operative CA requiring CPR. Vascular surgeons routinely perform high-risk procedures on elderly patients with severe co-morbidities, who are unlikely to survive post-operative CA. Our data provides an evidence base to facilitate individualized discussions regarding goals of care and DNR orders after major vascular procedures.

**Abstract Body:**

Total Functional Dependence	2.9	2.3-3.6	<.001
Dialysis	2.7	2.3-3.2	<.001
Emergency Case	2.2	1.9-2.5	<.001
Partial Functional Dependence	2.0	1.7-2.4	<.001
Preoperative ventilation	2.0	1.5-2.7	.001
History of MI	1.8	1.4-2.3	<.001
Dyspnea on Exertion	1.5	1.2-1.9	.001
Prior Cardiac Surgery	1.5	1.3-1.6	<.001
Recent Weight Loss	1.4	1.1-1.9	<.001
CHF	1.4	1.1-1.8	.005

**Presentation Number:** P13

**Publishing Title:** Operative Management of Aortic Graft Infection: A Single Center Experience of 53 Cases

**Author Block:** Ilkka K. Kantonen<sup>1</sup>, Ivika Heinola<sup>1</sup>, Marianne Jaroma<sup>2</sup>, Maarit Venermo<sup>1</sup>.  
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**OBJECTIVES:** Aortic prosthetic graft infection is a major challenge in vascular surgery carrying high morbidity and considerable mortality. Eradicating infection requires total prosthetic material removal, debridement and lower limb revascularization. Purpose of this single-institution retrospective study is to present our results on in situ replacement of infected aortic graft with lower extremity deep veins.

**METHODS:** From October 2000 until March 2013, 53 patients were operated on aortic prosthesis infection with total graft removal and reconstruction of neo-aortoiliac (NAIS) system of superficial femoro-popliteal veins.

**Abstract Body:** Median time from primary aortic reconstruction to infection diagnose was 36 month (10 days - 288 month), most common presenting symptom were fever and groin infection. 5 (9%) patients were treated as emergencies. For NAIS system one or both superficial femoral veins were harvested, proximally split and sewn together to match aortic diameter. Proximal anastomosis was enforced with piece of tensor fasciae lata and distal anastomoses were covered with sartorius muscle in the groin. 13 patients (25%) required intestinal resection or suturation because of aorto-enteric erosion or fistula. Most common bacterias isolated were Staphylococcus epidermidis and aureus, Enterobacter cloacae and E.coli, in 17 (32%) cases bacterial growth remained negative. Post-operatively intravenous antimicrobial therapy was administered at least 6 weeks.

**RESULTS:** There were 7 (13%) in-hospital death and three patients (6%) required major amputation. Re-infection rate was 2 (4%) and 4 patients continued life-long antibiotic therapy because of remained prosthetic material. Edema from venous harvesting appeared in 6 patients (11%).

**CONCLUSIONS:** In situ reconstruction with NAIS presents acceptable rates of mortality and morbidity remaining preferred operative treatment method for aortic prosthesis infection in Helsinki University Hospital.

**Presentation Number:** P14

**Publishing Title:** Delay in Surgery is Associated with Worse Peri-Operative Outcomes in Patients with Asymptomatic Abdominal Aortic Aneurysms

**Author Block:** Isibor J. Arhuidese, MB.BS MPH, Christopher J. Abularrage, MD, Umair Qazi, MD MPH, Julie A. Freischlag, MD, **Mahmoud B. Malas, MD MHS.**

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**Objectives:** Elective repair of Abdominal Aortic Aneurysms (AAA) is associated with significant perioperative mortality. When repair is delayed, patients with asymptomatic large AAA face the risk of death from rupture. We evaluate the impact of operative delay on perioperative mortality, which is largely un-documented, for patients who meet the criteria for repair.

**Methods:** We queried the American college of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database for all patients 50 years and older who underwent endovascular or open repair for asymptomatic AAA between 2005 and 2011. Multivariable logistic regression was used to evaluate the effect of increasing age on 30-day post-operative mortality. This association was analyzed with age as a categorical variable, in a spline model and as a continuous variable. Delay in repair was inferred from increments in age.

**Abstract Body:** **Results:** There was an 87% increase in the odds of death in patients aged between 65 and 79 years compared to patients less than 65 years (OR: 1.87 95%CI 1.24 – 2.81; P=0.002). The odds of death in patients aged 80 to 89 years was 3.5 times the odds of death in patients less than 65 years of age (OR: 3.5 95%CI 2.27 – 5.37; P<0.001). The odds of death in patients aged 90 years or more was 6.5 times the odds of death in patients less than 65 (OR: 6.5 95%CI 3.28 – 12.89; P<0.001). Spline models showed that the increase in perioperative mortality with age was linear. There was a relative increase of 7% (OR: 1.07, 95%CI 1.05 – 1.08; P<0.001) in the odds of death after repair of AAA with each year of operative delay independent of type of treatment. There was a relative increase of 5% for EVAR (OR: 1.05, 95%CI 1.03 – 1.07; P<0.001) and 8% for open repair (OR: 1.08, 95%CI 1.06 – 1.11; P<0.001) with each year increase in age.

**Conclusions:** To our knowledge, this is the first study that shows a linear relationship between age and perioperative mortality. Our results confirm that perioperative mortality worsens with increasing age and the advantage conferred by EVAR is higher at older ages. There is an increase in the risk of perioperative mortality associated with delay in repair of AAA for patients who meet the criteria for repair.

**Presentation  
Number:** P15

**Publishing  
Title:** Repair Of Mycotic Para-visceral Aneurysms: Mid-Term Results

**Author Block:** **Young Erben, MD**, Manju Kalra, MBBS, Thomas C. Bower, MD, Gustavo S. Oderich, MD, Audra A. Duncan, MD, Mark D. Fleming, MD, Randall De Martino, MD, Peter Gloviczki, MD.  
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**OBJECTIVES:** Para-visceral involvement in mycotic aortic aneurysms makes repair challenging given that standard extra-anatomical axillo-bifemoral bypass precludes visceral perfusion. The aim of this study was to evaluate our experience in the management of mycotic para-visceral aneurysms.

**METHODS:** Data from six patients with infected para-visceral aneurysms from January 1994 to August 2013 were retrospectively reviewed.

**RESULTS:** There were five males and one female. Median age was 64 years (4 months-80 years). Primary sources of infection included: vertebral osteomyelitis in two, endocarditis, lymphangitis, previous Mycobacterial infection and severe caries in one each. Five of the repairs were performed through a midline, trans-peritoneal approach and one through a thoraco-abdominal approach. Four synthetic grafts previously soaked in Rifampin and two cryopreserved homografts were used to replace the excised infected aorta. Four grafts were placed in-situ and two were routed extra-anatomically within the abdomen. Renal/visceral reconstruction was performed with synthetic bypasses in two, with saphenous vein in one and with homograft in one. Omentoplasty was performed in all. Temporary axillo-femoral bypass was utilized in one patient. Microorganisms isolated include: coagulase negative Staphylococcus and Propriobacterium agnes in two; Streptococcus, Coxiella burnetti and Staphylococcus aureus in one each. All patients survived the initial post-operative period without requiring dialysis. Three patients died at post-operative days 23, 37 and 56 due to aspiration, multisystem organ failure and ruptured diverticulitis respectively. Mean follow-up was 24 months (1 month-70 months). All survivors are currently receiving indefinite suppressive antibiotic therapy. There are no recurrences

**Abstract  
Body:**

**CONCLUSIONS:** Trans-abdominal repair of mycotic para-visceral aneurysms are challenging, however, they can be performed with low immediate mortality and satisfactory mid-term results.

**Presentation Number:** P16

**Publishing Title:** Salvage EVAR Using A Bifurcated Aortic Endograft In A Case Of Aortic Endograft Stent Migration

**Author Block:** Gerard P. De Castro, MD, MPH, Nikita Tihonov, MD, Chad E. Jacobs, MD, Ulku C. Turba, MD, Bulent Arslan, MD, Walter J. McCarthy, MD.  
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**OBJECTIVE** - We present a case of a re-operative EVAR in a 72 year old female with chronic renal failure who underwent an EVAR in 2004 and presented with abdominal and lower back pain. A CTA of her abdomen and pelvis demonstrated that her endograft had migrated distally and folded upon itself within the aneurysm sac (see Fig. 1a & b) while still maintaining flow through the stent graft and iliac limbs. The aneurysm sac was still fully pressurized and measured to be 6.8cm.

**METHODS** - We performed a re-operative EVAR through the previous aortic endograft via bilateral femoral artery incisions. A 36x16x145 Medtronic Endurant II modular bifurcated endograft with a 16x24x156 right limb extension and 16x16x156 and 16x16x124 left limb extensions was used. The main body graft was situated just distal to the celiac artery due to extension of her aneurysmal disease above the level of the renal arteries. The renal arteries were covered by the main body graft in this renal failure patient but the SMA was preserved with an 8x50 Viabahn stent and a 7x38 iCAST stent extension that was placed via snorkel technique by way of a left brachial artery access.

**RESULTS** - Completion arteriogram demonstrated successful aortic bifurcated endograft placement with widely patent iliac limbs. Both the celiac and SMA arteries were also widely patent. (Fig. 1c)

**CONCLUSION** - Stent graft migration is a known complication of EVAR. Treatment with unibody prostheses, proximal aortic extender cuffs, and open surgical conversion has been described. Re-operative EVAR using a bifurcated aortic endograft is another alternative in treating stent graft migration in carefully selected cases.

**Abstract Body:**

Fig. 1 (a, b, &c).





**Presentation  
Number:** P17

**Publishing  
Title:** Aortic Graft Infection with *Histoplasma capsulatum*: A Case Report

**Author Block:** John P. Davis, MD, Amit Jain, MBBS, MS, Joshua C. Eby, MD, John A. Kern, MD, Gilbert R. Upchurch, Jr., MD, Margaret C. Tracci, MD, JD.

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**Introduction:** Aortic graft infections remain a major clinical challenge for vascular surgeons. Typically, bacterial species such as *Staphylococcus*, *Streptococcus*, and enteric flora are implicated in these infections. Fungal infections have typically involved *Candida* or *Aspergillus* species. Reports of native vascular or graft infections involving *Histoplasmosis capsulatum* have been rarely reported in the literature.

**Abstract  
Body:**

**Case Description:** A sixty-year-old human immunodeficiency virus (HIV) negative male with prior infrarenal abdominal aortic aneurysm (AAA) repair presented to his primary care physician with back pain and hematuria. Computed tomography (CT) demonstrated multiple saccular aneurysms above and below his prior graft. The patient underwent wide resection of affected aortic tissue and reconstruction of visceral and infrarenal aortic segments with a rifampin-soaked, multi-branched polyester graft. Initial laboratory evaluation did not reveal leukocytosis and all blood cultures were negative. Intraoperative cultures revealed *Histoplasmosis capsulatum* in specimens including aortic thrombus, explanted graft, and aortic wall. Systemic antifungal therapy with liposomal amphotericin was initiated and subsequently transitioned to oral itraconazole for an anticipated 12-month course.

**Conclusion:** Aortic graft infections with *Histoplasma capsulatum* have rarely been reported in the literature. We describe an HIV negative patient with multiple saccular aortic aneurysms due to an aortic graft infection with *Histoplasma capsulatum* who was managed with resection of the infected graft and aortic wall, in-situ graft replacement, and combination antifungal therapy.

**Presentation Number:** P18

**Publishing Title:** Early Results of using Spiral Flow AV Graft: Is it a breakthrough solution to a difficult problem?

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**Objective:** Although, the preferred method to create an access is native AV fistula, there is still a significant number of patients where this is not feasible. AV access grafts are frequently used in those patients and their patency rates are far from being ideal requiring frequent interventions to maintain their use. Their failure is usually related to stenosis of the venous outflow due to intimal hyperplasia, specifically near the venous anastomosis of the graft. Neo-intimal hyperplasia may, in part, be a normal cellular response to an abnormal (turbulent) flow environment created by the AV access. The Spiral flow graft creates a more natural spiral laminar flow at the venous end that is a hypothetically a more friendly hemodynamic environment thus reducing intimal hyperplasia and graft failure. We here report the early results of the largest available series of using the graft in AV access.

**Abstract Body:** **Methods:** Retrospective review of all cases using the Spiral Flow graft for AV access in our institution, Jan 2012 to August 2013. Patients were selected had no suitable superficial veins for native AV fistula. Demographics and comorbidities were recorded. Kaplan Meier curve analysis used to calculate 1ry, assisted 1ry and 2ry patency rates in comparison to historic control of straight ePTFE and heparin bonded grafts for the same indication in our institution. Complications were also recorded.

**Results:** A total of 37 cases were included. The access site was the arm (19), the forearm (10), femoral (5) and chest wall (3). 2/3 were females, mean age of 60 years and mean follow up of 7 months. At 6 month, the primary, assisted primary and secondary patency rates were 90%, 90% and 100%, respectively. Only 3 grafts required thrombectomy during the follow up and continue to be used. Complications included 4 graft infections; 3 severe steal syndrome, 4 seromas and 2 arm swelling. There was only 1 early graft failure.

**Conclusions:** Spiral flow grafts are a valid and successful option for AV access. Early results tend to be significantly superior to using straight ePTFE and heparin bonded grafts. This may be explained on the basis of the hemodynamics created by the spiral laminar flow and may be a significant contribution to preventing AV access graft failure.

**Presentation Number:** P19

**Publishing Title:** Functional Status of Elderly Adults before and after Abdominal Aortic Aneurysm Repair

**Author Block:** Todd R. Vogel, MD, MPH, Gregory F. Petroski, PhD, Robin L. Kruse, PhD.  
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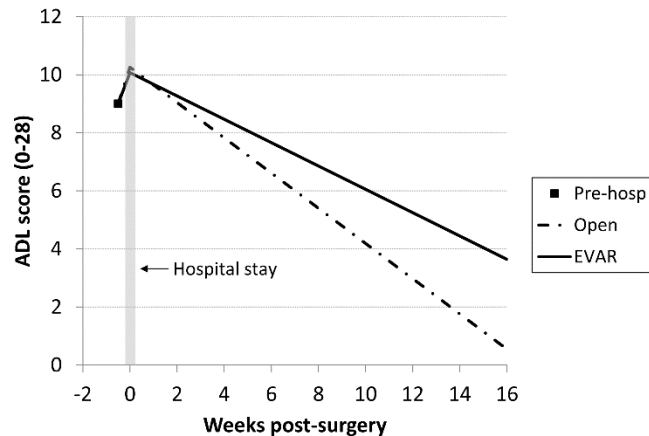
**Objectives:** Although many trials have evaluated Abdominal Aortic Aneurysm (AAA) repair, the impact of these procedures on the functional status in the frail elderly is not well described. The effects of elective open AAA repair (OAR) or endovascular AAA repair (EVAR) and comorbidities were evaluated for their impact on functional trajectories after discharge.

**Methods:** Medicare inpatient claims were linked with nursing home (NH) assessment data to identify elective admissions for EVAR and OAR. A functional score (0-28; higher indicating greater impairment) based on activities of daily living (ADL) was calculated before and after interventions. A logistic regression was used to develop a propensity score for receiving EVAR as residents were not randomized. Hierarchical linear modeling determined the effect of surgery on residents' function, controlling for pre-hospital function, hospital length of stay (LOS), stroke, and the propensity score.

**Results:** 161 residents underwent EVAR and 52 residents underwent OAR. 65.3% were men and 62.0% were from 76 to 85 years old. Mean LOS was 8.3 days for OAR and 5.1 days for EVAR. Prior to hospitalization, 47.4% of residents had good function (ADL score 0-10), and 48.4% were moderately impaired (ADL score 11-20). Compared to pre-hospital function, disability was greater following hospital discharge and subsequently improved. Higher baseline ADL score, increased LOS, and stroke were associated with worse trajectories. Procedure type was not significantly related to post-surgery impairment scores or the subsequent rate of improvement. By 120 days following hospital discharge, 6 residents had died, 65 were readmitted to the hospital, 56 remained in the NH, 79 were discharged to home or assisted living, and 7 lacked follow-up data.

**Conclusions:** OAR and EVAR were associated with similar initial declines and comparable post operative trajectories suggesting that less invasive EVAR was not associated with improved functional preservation compared to OAR. LOS was found to be higher than expected in the frail elderly after EVAR; longer stays were associated with poorer functional trajectories. Higher baseline ADL scores were significantly associated with inferior functional status after both procedures. Evaluation of preoperative function may assist physicians in predicting patient-centered outcomes in this high **risk population**.

**Abstract Body:**



ADL trajectories following aneurism repair for nursing home residents with the following characteristics: pre-hospital ADL function=9, hospital stay of median length, and no comorbidities

**Presentation Number:** P20

**Publishing Title:** **Feasibility of endovascular splenic artery aneurysm repair using low-profile self-expandable stent-grafts**

**Author Block:** **Nanette R. Reed, MD**, Gustavo Oderich, MD, Jesse Manunga, MD, Audra Duncan, MD, Manju Kalra, MBBS, Thomas Bower, MD, Mark Fleming, MD, Randall de Martino, MD, Peter Gloviczki, MD. Mayo Clinic, Rochester, MN.

**Objective:** Percutaneous trans-catheter embolization has been widely accepted as the first line treatment for most patients with symptomatic or large splenic artery aneurysms (SAAs). Embolization can be done safely, but carries a predictable rate of ischemic complications, which may result in splenic infarct or abscess formation. Recent advances in endovascular technology have allowed use of self-expandable, flexible, lower profile stent-grafts. The aim of this study was to evaluate the technical feasibility and early outcomes of endovascular SAA repair using self-expandable stent-grafts.

**Methods:** Endovascular SAA repair (ESAAR) was performed using 0.018-inch Viabahn stent-grafts (WL Gore, Flagstaff, AZ). Brachial access was used preferentially except for patients with proximal SAAs and favorable angle of origin from the aorta. To overcome tortuosity and provide support, a co-axial system with hydrophilic sheath was used. Low profile 0.018-inch stent-grafts were used for distal SAAs and smaller (<7mm) target vessel landing zones. Follow up included clinical examination and imaging at dismissal, every 6 months during the first year and yearly thereafter. End-points were morbidity, stent-graft patency, freedom from endoleak, aneurysm sac changes, and re-interventions.

**Abstract Body:**

**Results:** ESAAR was attempted in 8 patients, 3 males and 5 females, with median age was 64 years (range 48-77 years). Median SSA size was 2.2 cm (range 1.5-4.2 cm). Seven patients were asymptomatic and one presented with pancreatitis and gastrointestinal bleeding. Primary access site was brachial artery in 5 patients and femoral in 3. Technical success of ESAAR using stent-grafts was 80% (6/8); two patients with excessive vessel tortuosity and distal SAAs failed stent-graft placement and required coil embolization. One patient developed brachial artery thrombosis treated surgically. There were no ischemic complications in patients treated by ESAAR with stent-grafts. Median length of stay was 1 day. One patient treated by coil embolization developed splenic infarct, which required readmission. Median follow-up of 4.1 months. Follow-up imaging revealed patent stent grafts and no aneurysm sac enlargement. No re-interventions were required.

**Conclusions:** ESAAR using low-profile stent-grafts offers a viable treatment alternative to coil embolization in select patients with SAAs. Vessel tortuosity and distal aneurysm location may result in technical failure with currently available technology. Patients who underwent successful ESAAR with stent-grafts had no ischemic complications, stent-graft occlusions, endoleak, or sac enlargement.

**Presentation Number:** P21

**Publishing Title:** **Non-traditional Risk Factors that Influence Follow-up Attendance of Patients with Abdominal Aortic Aneurysms**

**Author Block:** **Sukhmine Baines, MA, MD<sup>1</sup>**, Kevin C. Chun, BS<sup>2</sup>, Ashley S. Schmidt, BA<sup>2</sup>, Jacqulyne H. Sylvia, BS<sup>2</sup>, Kiana M. Samadzadeh, BS<sup>2</sup>, Eugene S. Lee, MD, PhD<sup>1</sup>.

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**OBJECTIVES:** An active regional Veterans Affairs (VA) abdominal aortic aneurysm (AAA) screening program identified 652 patients with an intermediate size AAA (3.0 - 5.4 cm diameter) within a 5 year period. Typically, treatment for these AAA is ultrasound surveillance. We hypothesize that non-traditional risk factors can influence whether an AAA patient attends their follow-up appointment. The purpose of this study is to identify which non-traditional risk factors influence surveillance follow-up rates of intermediate sized AAA patients.

**METHODS:** A retrospective chart review of Veterans with a detected AAA from a large screening program from January 1, 2007 to December 31, 2011 was conducted. Non-traditional risk factors such as initial AAA diameter, assisted living status, employment eligibility (according to current VA eligibility criteria), marital status, and distance between home and the medical center were recorded. Follow-up was defined as receiving a follow up image at least 180 days after initial AAA screening. Both follow-up and no follow-up groups were compared for significance.

**RESULTS:** A total of 476 AAA patients were enrolled in this study with a follow up rate of 49% (231/476) (Table). During the follow-up period, 19.2% of patients in the no follow-up group died versus 10.0% in the follow-up group (p<.001). Non-traditional risk factors that were significantly associated with follow-up rates were AAA diameter  $\geq$  4 cm (p<.001) and being eligible for employment (p=0.02). Being married (p=0.047) and living further away from the hospital (p=0.04) were associated with not following-up.

**CONCLUSIONS:** Smaller aortic diameter, not being eligible for employment, greater distance to the hospital, and being married are associated with patients failing to follow-up. Further study is needed to determine whether being married is detrimental to making follow-up appointments.

**Abstract Body:**

Table			
	No Follow Up (n=245)	Follow-Up (n=231)	P-Value
AAA Diameter $\geq$ 4 cm	17.1%	32.5%	p<.001
Assisted Living	13.1%	12.6%	0.87
Eligible for employment	88.6%	94.4%	0.02
Married	56.7%	47.6%	0.047
Average Distance to Hospital (mi)	125 $\pm$ 299	89 $\pm$ 106	0.04

**Presentation Number:** P22

**Publishing Title:** Percutaneous thrombolysis of acute-on-chronic IVC thrombosis after previous insertion of an Adams-DeWeese Clip

**Author Block:** Mark E. O'Donnell, MMedSc MD FRCS, Sailendra G. Naidu, MD, Kathryn E. Coan, MD, Grant T. Fankhauser, MD, Richard J. Fowl, MD, William M. Stone, MD, Fadi E. Shamoun, MD, Samuel R. Money, MD. Mayo Clinic, Phoenix, AZ.

**OBJECTIVES:** Complete IVC interruption for pulmonary emboli (PE) prophylaxis was replaced by partial interruption procedures to minimize acute cardiovascular collapse and chronic venous insufficiency complications whereby the Adams-DeWeese clip was developed.

**METHODS:** We describe the successful percutaneous treatment of acute-on-chronic IVC thrombosis thirty-one years following previous placement of Adams-DeWeese clip.

**RESULTS:** A 60-year old female nurse presented with a ten-day history of increasing back pain, bilateral lower extremity edema and a significant weight gain with progressive dyspnea. She had known protein C deficiency and an Adams-DeWeese Clip had been previously placed following multiple PE after complications of gastric bypass surgery thirty-one years previously. She was initially on Coumadin for two-years before switching to aspirin 325mg daily. She was a non-smoker. She was hemodynamically stable with normal breath sounds and bilateral lower limb edema. Venous duplex revealed bilateral lower extremity occlusive thrombosis extending to the common femoral vein. CT venography confirmed thrombus extending superiorly to the infrarenal IVC adjacent to the previously inserted Adams-DeWeese clip (Figure 1). The patient was commenced on a therapeutic heparin infusion. Venography performed for severe symptomatology confirmed significant IVC clot burden which was treated with pulse spray tissue plasminogen activator (tPA) followed by percutaneous mechanical thrombectomy (Angiojet®, Possis Medical). Two high-grade right superficial femoral vein stenoses were treated with balloon angioplasty. Two weeks later repeat imaging confirmed IVC thrombus recurrence which was treated with a twenty-four hour tPA infusion following placement of two 50cm infusion catheters (AngioDynamics Uni-fuse™) below the Adams-DeWeese clip. Residual clot burden the next day required mechanical thrombectomy. Partially improved flow necessitated a further tPA and heparin infusion. Continued IVC poor flow on day-three required passage of bilateral stiff angled Glidewires proximally through two fenestrations in the Adams-DeWeese clip. Repeat mechanical thrombectomies followed by sequential balloon venoplasty through the Adams-DeWeese clip fenestrations finally improved flow (Figure 1). The patient remains mobile two years later and continues with compression hosiery and lifelong anticoagulation.

**CONCLUSIONS:** Although the current prevalence of patients with in-situ IVC interruption devices remains unknown, clinical symptomatology may only present following additional precipitating events often requiring multiple procedures using a myriad of modalities in conjunction with long-term anticoagulation treatment.

**Abstract Body:**



**Presentation Number:** P23

**Publishing Title:** Endovascular Closure of Patent Ductus Arteriosus with a Thoracic Stent Graft

**Author Block:** William B. Harris, D.O., Mark W. Fugate, M.D., Larry R. Sprouse, Jr., M.D., Clifton S. Reade, M.D., Christopher J. Lesar, M.D..

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**Background:** The open repair of a patent ductus arteriosus (PDA) in the elderly can be a high-risk operation due to aneurysmal and degenerative changes to the aorta that occur over time. Thoracic stent grafts (TSG) have emerged as viable therapy for endovascular repair of thoracic aortic aneurysms. We report the use of a thoracic stent graft to close a PDA.

**Methods:** A 76 year-old female who was followed for several years for a known PDA was referred for evaluation due to worsening pulmonary hypertension. She noted progressively increasing shortness of breath over the last several months. Cardiac catheterization with selective pulmonary artery catheterization revealed pulmonary arterial pressures of 60 mmHg. Electively the patient underwent exposure of the left common femoral artery and advancement of a TSG into the thoracic aorta. Pulmonary artery catheter was placed during the operation and pressures were monitored throughout. A Medtronic Valiant device was landed at Zone 2 proximally, extending distally past the PDA.

**Results:** Completion aortogram demonstrated no flow into the pulmonary arterial system, and pulmonary artery pressures dropped after deployment to 25 mmHg. The patient was seen in followup upwards of 4 months later with resolution of her shortness of breath.

**Conclusion:** This hybrid and novel approach to treating a PDA in the elderly is well tolerated and viable solution to a complex problem.

**Abstract Body:**



**Presentation Number:** P24

**Publishing Title:** Open Operative Ligation of Type II Endoleaks Result in a Safe and Durable Repair

**Author Block:** **William B. Harris, D.O.**, Larry R. Sprouse, Jr., M.D., Christopher J. Lesar, M.D., Charles S. Joels, M.D., Jeffrey S. Horn, M.D., Mark W. Fugate, M.D., Michael S. Greer, M.D.  
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**Objectives:** The continued expansion of infrarenal abdominal aortic aneurysms in patients with persistent type II endoleaks refractory to endovascular management presents a challenge to the practicing vascular surgeon. Open repair of these endoleaks is a viable therapeutic option.

**Methods:** A retrospective review of medical records of all Endovascular Aortic Aneurysm Repairs conducted at our institution in a 7 year span was conducted. All patients who underwent open ligation of type II endoleaks were included in the study. Patients were followed postoperatively with serial duplex ultrasounds to rule out further endoleak and determine sac diameter.

**Results:** We identified 10 patients that underwent open operative ligation of type II endoleak. All aortic sacs were explored. One patient required infrarenal cross-clamping with subsequent fixation of the proximal aorta to the device. No patients required explantation of the graft. All patients had persistent lumbar arteries feeding the aneurysm sac that were ligated. There were no perioperative deaths. Mean length of hospital stay was 5 days (range 3-9). Perioperative complication rate was 20%, with one patient experiencing cardiac arrhythmias postoperatively and another patient developing a hematoma requiring operative evacuation. On follow-up duplex ultrasonography, no residual type II endoleaks were identified in any of the treated patients. Moreover, no aortic sac expansion was seen in any patient. Average follow-up was 13.6 months (Range 4-28mo).

**Conclusions:** Open repair of abdominal aortic type II endoleaks is a durable method of treating endoleaks refractory to endovascular management. This can be done with low morbidity and mortality with long-lasting results.



**Presentation  
Number:** P25

**Publishing  
Title:** Experience with Covered Stents for the Management of Infected Arteriovenous Grafts

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**OBJECTIVES:** The traditional management of infected arteriovenous dialysis access with aneurysmal or pseudoaneurysmal degeneration and bleeding involves removal of all or part of the graft. We report a series of patients who had overt signs of infection and bleeding and were managed with graft preservation.

**METHODS:** Five patients presented with bleeding aneurysm or pseudoaneurysm of arteriovenous grafts. Each access had overt signs of infection including ulceration and surrounding erythema. One patient had staphylococcus aureus positive blood cultures two days prior to presentation. All patients underwent percutaneous fistulogram and placement of a covered self-expanding stent covering the area of graft defect. All patients were then administered intravenous antibiotics on dialysis for 2-6 weeks after intervention.

**Abstract  
Body:**

**RESULTS:** All 5 grafts were preserved and used immediately for dialysis access. There were no procedure related complications. One patient developed respiratory distress secondary to aspiration on postoperative day 1. Another patient developed late signs of systemic infection. One patient with preoperative bacteremia had positive blood cultures post intervention and required complete graft excision.

**CONCLUSIONS:** Bleeding arteriovenous grafts with local signs of infection can be managed with graft preservation in select cases. It appears that positive blood cultures may preclude graft salvage.

**Presentation  
Number:** P26

**Publishing  
Title:** Hepatic Artery Aneurysm: A Case Report and Literature Review

**Author Block:** **Katie M. Shean, M.D.**, Charles Strom, M.D., Scott Johnson, M.D., Nikhil Kansal, M.D  
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**OBJECTIVES:** Hepatic artery aneurysms (HAA) represent a rare visceral pathology, with only 500 cases noted in the literature. Interestingly, the incidence of these splanchnic vessel aneurysms is rising as of late, likely due to increased spiral imaging, iatrogenic trauma from endoscopic interventions, minimally invasive procedures for hepatobiliary disease and non-operative management of blunt trauma. Many of these cases are asymptomatic, though they have the highest rate of rupture among all splanchnic artery aneurysms. The natural history of HAA is not clearly defined, prompting a more aggressive approach to operative management. We present an interesting case report demonstrating this rare pathology followed by an extensive literature review of the management of HAA from 2000-2013 to better describe the operative indications for repair of this arterial anomaly.

**METHODS:** We performed an in-depth literature search using PubMed and MEDLINE with the search terms "hepatic artery aneurysm" and "operative management."

**Abstract  
Body:**

**RESULTS:** We present the case of a 72-year-old female who was incidentally found to have a 4cm asymptomatic HAA noted on a CT scan that was initially ordered for evaluation of kidney stones. Additionally, she was found to have occlusion of her celiac artery with retrograde flow into the celiac axis circulation via a markedly enlarged gastroduodenal artery. She underwent repair of the aneurysm with supraceliac aortosplenic and aortohepatic bypass using a bifurcated Dacron graft. This case represents a key aspect in the management of HAA; though asymptomatic, her risk of rupture was high and required intervention. Our literature search revealed that the vast majority of these aneurysms are asymptomatic and diagnosis occurs incidentally or after rupture. Patients were more often male, with an average age of 60 years. The average aneurysmal size was 2.8cm. Although some were managed with close observation, most required surgical intervention. Both endovascular and open approaches were employed, with embolization, stent, ligation or bypass graft being utilized. **CONCLUSIONS:** HAA is a rare and dangerous condition, many of which ultimately rupture. Given the high mortality, these patients should be closely monitored and surgical repair should be at the forefront of treatment. Repair is recommended for aneurysms that are symptomatic, rapidly enlarging, greater than 2cm in diameter, or associated with fibromuscular dysplasia or polyarteritis nodosa. There is ongoing debate over endovascular versus open repair.

**Presentation Number:** P27

**Publishing Title:** Axillary Artery Access for Deployment of the Iliac Limb During Endovascular Aneurysm Repair (EVAR) for Preservation of Pelvic Perfusion

**Author:** Alexandros Mallios, MD, Rob Brown, MD, John Blebea, MD, MBA.

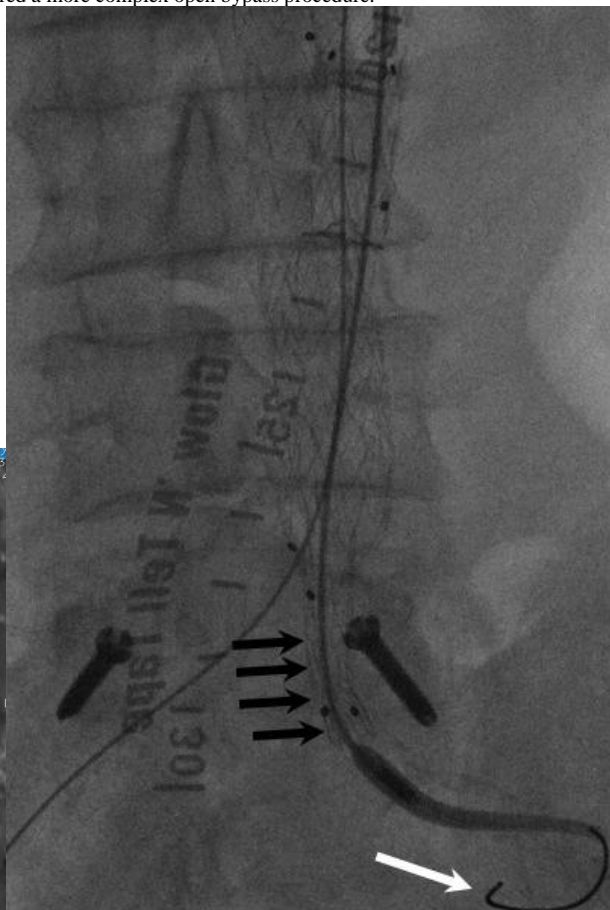
**Block:** University of Oklahoma, Tulsa, OK.

**Background:** The axillary artery approach has been used for access in complex endovascular aortic procedures, such as Thoracic Endovascular Aortic Repair (TEVAR) with poor anatomy for traditional deployment, as well as for fenestrated and branched aortic endografts. We report the first case of an iliac graft limb deployment through the axillary artery during an EVAR for maintenance of antegrade internal iliac flow in a patient with chronic ipsilateral occlusion of the external iliac and femoral artery.

**Case Report:** A 65 year old male patient with a previous history of coronary artery disease, heart failure, hypertension and COPD was referred to our institution for a symptomatic Abdominal Aortic Aneurysm (AAA) with a maximum diameter of 5.7cm. Anatomically, this AAA was not suitable for EVAR as the proximal neck had an angulation superiorly of 90 degrees. In addition, a bifurcated graft was not indicated as the aortic bifurcation was small at 11x14mm and there was occlusion of the left external iliac and femoral arteries. Due to patient's symptomatology and multiple comorbidities, we decided to proceed with endovascular treatment. However, the patient's left hypogastric artery was deemed to be crucial for the viability of his left lower extremity and pelvic perfusion. A bifurcated graft was utilized, with deployment of the left iliac limb through the left axillary artery. The operation was without complications after the addition of a proximal aortic cuff for an endoleak. At 6 months' follow up, the clinical examination revealed no abdominal pulsatility, no buttock claudication and a CT scan of the AAA demonstrated a reduced sac diameter.

**Conclusion:** The axillary artery can be used in selected cases of complex endovascular treatment of aortic pathology. This is the first reported case of successful deployment of the iliac limb from the axillary artery during EVAR. It provided an excellent solution for a patient that otherwise would have required a more complex open bypass procedure.

**Abstract Body:**



**Presentation Number:** P28

**Publishing Title:** Is the Incidence of Lower Extremity Amputation Higher in Older Patients (>70) Presenting with Critical Limb Ischemia?

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**OBJECTIVES:** Average life expectancy continues to increase, and as a result a patient's age has become an important factor in the management and outcome of critical limb ischemia (CLI). This study was done to determine if age plays a role in presentation, management and outcome of CLI.

**METHODS:** A retrospective review of all patients that presented with CLI from January 1, 2007 to December 31, 2007 was conducted. CLI was defined as ischemic rest pain, non-healing ulceration or gangrene. All patients underwent conventional arteriography and if possible an endovascular, open or hybrid procedure for limb salvage. Data was analyzed to determine any significant differences in presentation and outcomes in the group of patients >70 compared to those <70 years old. Data points included in the analysis were: Rutherford class, TransAtlantic InterSociety Consensus II (TASC II) classification, types of intervention (open, endovascular or hybrid), in hospital mortality, one-year amputation free survival and rate on re-intervention. Significance defined as  $p < 0.05$ .

**Abstract Body:** **RESULTS:** One hundred and forty eight patients presented with CLI over this one year period. There were 82 (55%) individuals <70 years old and 66 (45%) >70 years old. The two groups had similar demographics. Patients in the >70 group were more likely to present with Rutherford Class 5 (ulceration/gangrene) disease. Both groups had similar rates of TASC II D iliac disease ( $p > 0.05$ ), however, the > 70 group had a higher prevalence of TASC II D femoropopliteal disease (56% vs. 37%,  $p < 0.05$ ) and a higher prevalence of infrapopliteal disease (66% vs. 52%,  $p < 0.05$ ). Patients in the >70 group were more likely to be treated with open procedures and had higher postoperative mortality (6.45% vs. 1.21%,  $p < 0.05$ ). One year amputation rate was significantly higher in the >70 group population (15% vs. 6%,  $p < 0.05$ ). Average primary patency rates in both groups were about 24 months. Rate of re-interventions was similar in both groups (17% vs. 15%,  $p > 0.05$ ).

**CONCLUSIONS:** Patients over seventy years of age (>70) are more likely to present with TASC II D femoropopliteal and infrapopliteal disease. This may be attributed to a higher one year amputation rate in this group. Postoperative mortality is also higher in the >70 group. Primary patency and re-intervention rates do not appear to be age dependent.

**Presentation Number:** P29

**Publishing Title:** Outcomes of single-vs. two-port laparoscopic peritoneal dialysis (LPD) performed by vascular surgeons.

**Author Block:** MD. Carlos F. Bechara, MD MS, Jesus Matos, MD, Neal Barshes, MD MPH, George Pisimisis, MD, Panos Koungias, MD, Peter Lin,

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**Objectives:** The prevalence of peritoneal dialysis (PD) use in the United States is around 6-7%. There is shortage of surgeons interested in PD catheter insertion, due to inadequate training and low referral. The Centers for Medicare and Medicaid is advocating the utilization of home dialysis, which is leading to increased PD catheter insertion. The aim of the current study is to examine outcomes and complications of LPD performed by vascular surgeons.

**Methods:** We performed retrospective chart review of all consecutive patients receiving laparoscopic PD (LPD) catheter placement using a single- or a two-port technique from 6/1/2008-6/30/2012. We compared operative times, intraoperative complications and 30-day complications, mortality and long-term catheter use between both techniques.

**Abstract Body:**

**Results:** A total of 97 patients underwent LPD, of whom 69 (71%) received a single-port LPD. Average operative time for single port LPD was 16.6 vs. 41.2 minutes for two-port LPD, ( $P < .05$ ). Nineteen (19.6%) patients had prior abdominal surgery, of whom 5 (5.2%) required lysis of adhesions using 2-port LPD. There were no intra-operative or 30-day complications in the two-port group. One patient in the single-port group suffered an iatrogenic iliac artery injury requiring operative repair. There were no deaths within 30 days in both groups. Thirteen (14.2%) catheters were removed due to infection. Average catheter use is 16.2 months. There was no catheter migration in the two-port group and 3 in the single-port group.

**Conclusions:** LPD catheters can be safely and expeditiously performed by vascular surgeons with excellent results. Single-port LPD can be placed faster, but may have devastating complications. With the changes in vascular residency training, we hope these skills are maintained to match the demand for PD catheter placement. A randomized study comparing the 2 techniques is warranted.

**Presentation Number:** P30

**Publishing Title:** Open Surgical Repair of Iliac Venous Aneurysm: A Case Report and Review of the Literature

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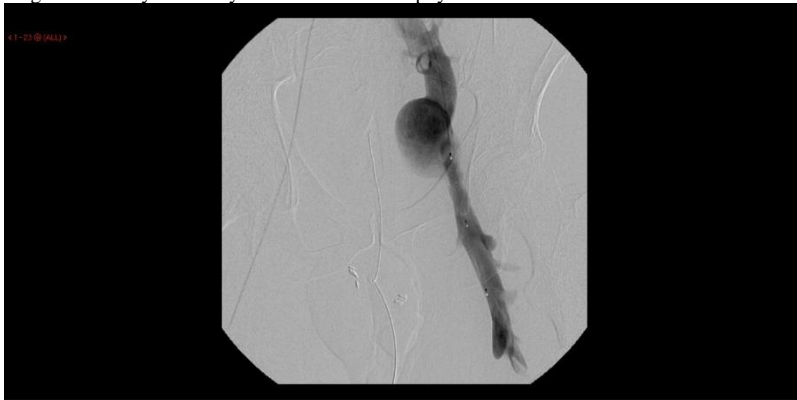
**Background:** Aneurysms of the iliac vein are rarely encountered in clinical practice. Etiologies can be primary (idiopathic) in nature or can be secondary to proximal obstructions or arteriovenous fistulae. We report a finding of bilateral venous aneurysms with subsequent operative repair.

**Methods:** We present the case of a 54 year-old previously healthy male who presented with swelling and phlegmasia dolens to bilateral lower extremities. Duplex-ultrasonography and subsequent venogram demonstrated an occluded vena cava with stenosis and bilateral iliac vein aneurysms and thrombus. Percutaneous thrombectomy in conjunction with angioplasty and stenting of the vena cava was utilized to treat the thrombus in the acute setting. While over several months there was complete resolution of the right iliac venous aneurysm, the left iliac venous aneurysm persisted, measuring approximately 4.7cm in maximum diameter. The patient was subsequently taken to the operating theater in an elective fashion for repair. The aneurysmal portion of the vein was resected sharply to create a normal size conduit which was closed primarily.

**Results:** Excellent flow was observed through the iliac vein with ultrasound at the conclusion of the case. Follow-up duplex-ultrasonographic and venographic studies of the left iliac vein demonstrated normal flow through the channel with no residual aneurysmal changes.

**Conclusion:** Iliac venous aneurysms are an extremely rare entity that when encountered can be successfully managed with tangential aneurysmectomy and lateral venorrhaphy.

**Abstract Body:**



**Presentation Number:** P31

**Publishing Title:** Risks Associated with Modern Open Aortic Surgery: Abdominal Aortic Aneurysm Patients Have A Higher Rate of Postoperative Complications than Aortic Occlusive Disease Patients

**Qinghua Pu, MD, Atul Rao, MD, Alexander Shiferson, DO, Michael Shih, MD, Muhammad A. Khan, MD, Suttatip**

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**OBJECTIVE:** Open elective abdominal aortic surgery remains a relatively high-risk procedure in the modern era compared to endovascular therapies. The decision process to proceed with a non-endovascular option may be somewhat different for patients with abdominal aortic aneurysm (AAA) disease versus patients with aortoiliac occlusive disease (AIOD). The goal of this study is to compare these two groups of patients with open aortic surgery in the modern endovascular era with regard to risk factors, postoperative morbidity and mortality.

**METHODS:** Patients that underwent AAA and AOD open aortic surgery in the National Surgical Quality Improvement Program (NSQIP) database from 2005 to 2011 were identified through a combination of procedure and diagnosis codes. Propensity score analysis was performed to age-match both groups. Preoperative risk factors and 30-day outcomes of surgery were compared between two groups using the t-test or Chi-square test.

**RESULTS:** A total of 5780 patients were identified during the study period; AAA (n = 4639), AIOD (n = 1141). The average age of AAA patients was 9.1 years older than AIOD patients (p<0.001). After age-matching, the AIOD-group were found to have significantly higher prevalence of insulin-treated diabetes, smoking and severe PVD. In contrast, more AAA patients had history of cardiac surgery, while there was no differences in ischemic heart disease. The AAA-group had shorter duration of surgery, but the requirement for blood transfusion was similar. Postoperatively, more AAA patients had acute renal failure (3.5% vs 2.0%, p<0.05), urinary tract infection (4.3% vs 2.4%, p<0.01) and ventilation>48 hours (10.4% vs 7.8%, p<0.05). The AIOD-group had more surgical site infection (6.1% vs 2.2%, p<0.001), graft failure (2.7% vs 0.5%, p<0.001) and returning to OR (13.5% vs 8.1%, p<0.001). No difference was found in hospital length of stay, 30-day mortality, myocardial infarction or stroke.

**CONCLUSION:** AAA and AIOD patients are demographically different. With adjusted age, patients with AAA are at higher risk of developing postoperative organ dysfunction than patients with occlusive disease, despite no significant differences in hospital length of stay or 30-day mortality. Patients selected for open AAA surgery should be considered for a more thorough preoperative investigation to minimize post-operative organ dysfunction. Special attention should be focused on reducing the high rate of pulmonary complications in both groups.

**Abstract Body:**

**Presentation Number:** P32

**Publishing Title:** Is Carotid Artery Patching Always Required to Prevent Restenosis Following Carotid Endarterectomy (CEA)?  
**Nicholas J. Gargiulo, III, MD FACS.**

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**Abstract Body:**

**OBJECTIVES:** Routine patching and periodic postoperative duplex have been widely advocated to achieve optimal results after carotid endarterectomy (CEA). The present 21 year single surgeon experience evaluates the long term outcome of CEA with selective patching and without routine postoperative duplex evaluation.

**METHODS:** An IRB approved retrospective review of all CEAs performed by a single surgeon over a 21 year (1984-2005) period. Preoperative imaging studies, operative reports, physical findings, and co-morbid conditions as well as pre- and postoperative medications were evaluated. Patients having undergone follow-up duplexes are the basis for this review. Restenosis was defined as angiographic criteria suggesting an 80% or more diameter reduction requiring re-intervention.

**RESULTS:** Over a 21 year period, 384 CEAs were performed using a selective patch technique depending on gender, internal carotid artery diameter, cardiovascular risk factors, and preoperative arteriogram. Eighty (20.8%) patients had duplexes performed at this institution as part of their regular follow-up. The remaining 304 patients had clinical follow-up on a yearly basis. Ten of eighty (12.5%) had prosthetic or vein patch closure and seventy of eighty (87.5%) underwent primary closure. The mean follow-up was 49.5 months with a range of 1 to 237 months. Restenosis in the patch group was zero of ten (0%). Sixty-six of seventy (94.2%) patients of the primary closure group did not show any evidence of restenosis. Four patients (5.8%) had arteriographically proven greater than 90% stenosis and required repeat CEA. The remaining 304 patients without routine postoperative duplex remained neurologically asymptomatic (mean follow-up 10.3 years, range 2.5 to 17 years).

**CONCLUSIONS:** In this experience, there is no statistically significant difference in restenosis in the primary closure and selective patch group following CEA. Additionally, the absence of routine postoperative duplex failed to change the clinical outcome in a majority of patients. Although this data set is a small, single center, single surgeon, retrospective review, it does not support the generally well accepted view of routine patching following CEA.



**Presentation  
Number:** P33

**Publishing  
Title:** Endovascular Management of Subclavian Pseudoaneurysms

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**Author Block:** M.D..

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**Background:** Subclavian artery injury may occur during the insertion of a central venous line or after trauma. There are several options for management of this dreaded complication.

**Purpose:** To review the management of subclavian artery injuries.

**Methods:** A retrospective chart review of all patients identified with a subclavian artery traumatic or iatrogenic injury during the insertion of a central line. Treatment included percutaneous insertion of a covered stent, closure device, open thoracotomy or a hybrid procedure. 30-day outcomes were recorded.

**Results:** In a 3-year period, ending in August 2013, 13 patients, 7 women and 6 men (average age 61, range 40 to 85) were admitted for a variety of clinical conditions, all critically ill in the surgical intensive care unit. During resuscitation, attempted central venous line insertion of a 8 or 9 Fr introducer resulted in a subclavian artery iatrogenic injury, seven on the left and six on the right. Viabahn stent was delivered percutaneously in 7 patients and Bard Fluency in one. Three patients had Perclose and Starclose closure. One patient had open thoracotomy and repair of the innominate artery since the injury was at the juncture of the 2 great vessels. One patient had a hybrid procedure, an open thoracotomy with delivery of the Viabahn stent to the left subclavian through the ascending aorta. The last patient expired from intracranial bleeding before any repair was attempted. In addition to the latter patient, 3 others died of their underlying disease within 30 days.

**Abstract  
Body:**

**Conclusion:** Traumatic and iatrogenic subclavian artery injury is difficult to manage. In most cases, a covered stent graft can be delivered percutaneously for a satisfactory repair. In select cases, a closure device can be attempted. Open thoracotomy is rarely required.

**Presentation  
Number:** P34

**Publishing  
Title:** Advanced Age and Disease Predict Lack of Satisfaction After Iliac Stent Placement

**Author Block:** **ROLAND ASSI, MD<sup>1</sup>**, KIRSTYN BROWNSON, MD<sup>1</sup>, MICHAEL HALL, MD<sup>1</sup>, PENNY VASILAS, RN<sup>2</sup>, CASSIUS CHAAR, MD<sup>1</sup>, ALAN DARDIK, MD, PHD<sup>1</sup>.

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**Objectives:** Percutaneous angioplasty and stenting of iliac arteries has supplanted open bypass surgery in the treatment of iliac artery disease. However, despite successful radiologic results, some patients do not benefit clinically and are not satisfied with their treatment. This study seeks to identify factors associated with lack of satisfaction after iliac artery stenting.

**Methods:** Between January 2008 and July 2012, all patients who underwent endovascular treatment of an iliac artery at our institution were included; hybrid treatments combined with simultaneous open treatments were excluded. A retrospective review of charts was conducted and preoperative, operative and post-operative data was collected. JMP ® 9.0.0 software was used for data analysis.

**Abstract  
Body:**

**Results:** 62 patients had a total of 91 iliac artery stents placed percutaneously. All patients were male with a mean age of  $66.5 \pm 8.0$  years. 47 (52%) had critical limb ischemia, 42 (46%) had an occluded ipsilateral femoral artery, and 77 (85%) had at least 2-vessel distal runoff. Angiographic success was 100%. Perioperative mortality and non-fatal complications were 3.3% (n=3) and 8.8% (n=8), respectively. The mean follow-up time was  $24.5 \pm 15.7$  months, during which 11 (12%) developed restenosis and 31 (34%) required additional surgical interventions (mean time to intervention  $4.3 \pm 7.3$  months). Symptomatic improvement on the first postoperative visit was 55% (n=50). Lack of satisfaction was correlated with older age (OR 1.09 [1.03 - 1.17], p=0.008), presence of critical limb ischemia (OR 3.03 [1.09 - 8.65], p=0.034), and need for additional surgical intervention (OR 5.614 [1.65 - 17.36], p=0.006).

**Conclusion:** Despite successful radiological revascularization, older patients who undergo iliac stenting in the setting of critical limb ischemia are less likely to experience symptomatic improvement and more likely to require additional surgical interventions. These patients form a high risk group that need careful planning and follow-up after iliac intervention.

**Presentation Number:** P35

**Publishing Title:** Open Repair of a Primary Arteriovenous Fistula of the Thyroid Cervical Trunk and the External Jugular Vein: A Case Report

**Author:** John Phair, B.S., Eric Trestman, M.D., Jennifer Stableford, M.D..

**Block:** Albert Einstein College of Medicine at Montefiore, New York, NY.

**OBJECTIVES** - To report the first documented case of a congenital arteriovenous fistula between a branch of the thyrocervical trunk and the external jugular vein.

**METHODS** -An extensive literature search through MEDLINE was performed with no results in regards to primary fistulas between these two vessels. The following search terms were used: thyrocervical trunk, external jugular vein, congenital, primary, fistula. There are however, documented reports of traumatic arteriovenous fistulas of various blood vessels of the neck.

**RESULTS** - Case report: We report a case of primary neck fistula between a branch of the thyrocervical trunk and the external jugular vein in a patient with a bulging mass in her neck. The diagnosis was evident with duplex and computed tomographic angiography results. The patient's condition was successfully managed with open resection of the fistula and aneurysmal segment.

**CONCLUSIONS** - This case represents the first documented primary arteriovenous fistula between the thyrocervical trunk and the external jugular vein. Congenital arteriovenous fistulas are a rare cause of neck masses. While there is little to no literature on congenital fistulas of the neck, it is the convention to intervene on traumatic arteriovenous fistulas, either by open surgical repair or endovascular coiling, due to their studied propensity for increasing in size and flow.

**Abstract Body:**

