

Wednesday, June 06

9:30 am - 12:30 pm

V1: Peripheral Vascular Surgical Society Paper Session I

**Moderators: Robert Feezor
Matthew Corriere**

9:30 am

PVSS1. Long-Term Functional Outcomes of Brachio-Basilic Arterio-Venous Fistulas

Casey Yossa, Dean Healy, Satish Muluk

Cardiovascular & Thoracic Surgery, West Penn Allegheny Health System, Pittsburgh, PA.

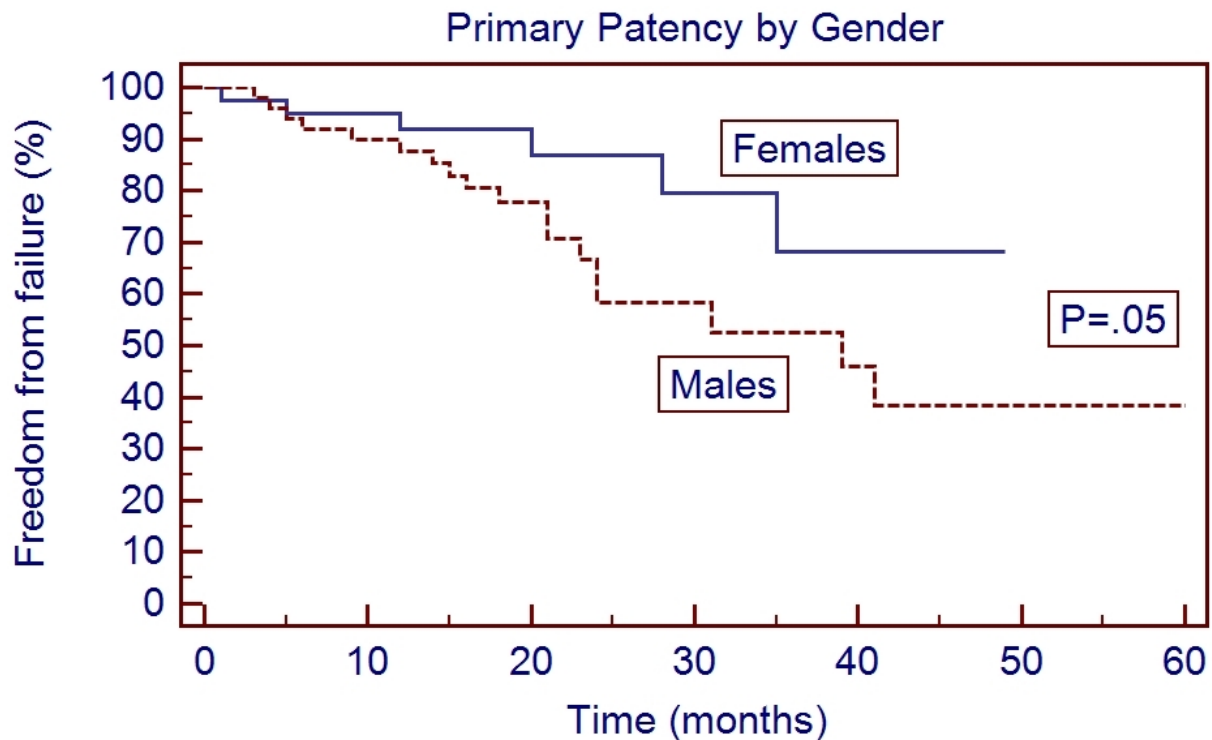
OBJECTIVES: According to NKF-DOQI guidelines, brachiobasilic fistulas (bbfs) are the next best alternative if a radio- or brachio-cephalic fistula cannot be successfully created. However, there are few current, large series in the literature examining their outcomes. Our objective was to review our experience with bbfs, including the factors affecting functional patency.

METHODS: We reviewed 134 consecutive bbfs performed over a period of 5 years. We recorded demographics, comorbidities, time to access, and functional patency. Data were analyzed by chi-square, life-table, and proportional hazards modeling.

RESULTS: 15 patients were either lost to initial follow up (n=6), died (n=8), or received transplant (n=1) before dialysis was attempted. Among the remaining 119, mean follow-up was 22 months. Three bbfs were ligated early due to steal and 25 failed to mature. 91 bbfs (76%) matured to successful dialysis. Of these, median time to first access was 6 weeks (mean 6.4 weeks). By life-table analysis, median functional primary patency was 41 months, while median primary assisted patency was 49 months. The only significant factor predicting increased primary patency was female gender (figure). Diabetic patients exhibited a non-significant trend toward shorter patency. BMI, age, and smoking were not predictors of time to failure.

CONCLUSIONS: This large series shows that bbfs can yield acceptable long-term functional outcomes with maturation rates higher than those generally reported for forearm fistulas. The procedure appears to be especially valuable in females, and outcomes are not adversely affected by elevated age or BMI.

AUTHOR DISCLOSURES: **D. Healy:** Nothing to disclose; **S. Muluk:** Nothing to disclose; **C. Yossa:** Nothing to disclose



9:45 am

PVSS2. NORMAN M. RICH AWARD – Microvascular Porcine Model for the Optimization of Composite Tissue AutoTransplantation
 Cpt Carole Villamaria, Col Todd Rasmussen, Jerry Spencer, LtCol Michael Davis
US Army Institute of Surgical Research, Ft. Sam Houston, TX

INTRODUCTION: Devastating extremity injuries are prevalent on the modern battlefield. Improved body armor, rapid evacuation times and advanced critical care yield survivability in the face of catastrophic limb trauma. The number and complexity of these injuries requires novel methods for salvage and reconstruction. This model is designed to assess the solution H2S for its ability to optimize tissue stability and viability during composite tissue transplantation and thus expand reconstruction applications.

METHODS: A donor gracilis myocutaneous flap with its associated Mathes type II arteriovenous axis is procured from 70-90kg Yorkshire swine. Utilizing the right external carotid artery and internal jugular vein as the recipient axis, microvascular anastomosis is performed. Control group 1 undergoes immediate microvascular anastomosis with resultant 1 hour ischemic period with interim perfusion with heparinized saline. Control group 2 undergoes delayed anastomosis with 3 hour ischemic period and interim perfusion with heparinized saline. These are compared with experimental group I which undergoes interim perfusion with H2S for 1 hour and experimental group 2 which undergoes interim perfusion with H2S for 3 hours. Markers of ischemia-reperfusion injury are evaluated following anastomosis and on POD#1, 2, 7 and 14.

RESULTS: This porcine microvascular model has been validated and control animals accomplished. The standard degree of ischemia-reperfusion injury has been established in the controls with laboratory and histologic analysis. Experimental groups are now underway.

CONCLUSIONS: We have established and validated a novel porcine model for microvascular

composite tissue transplantation. This model will be utilized to assess the effects of H2S on tissue stability and viability, and optimize conditions for transplantation and for the eventual induction of immunotolerance to composite tissue allotransplants.

AUTHOR DISCLOSURES: Cpt Carole Villamaria, Col Todd Rasmussen, Jerry Spencer, LtCol Michael Davis

10:00 am

PVSS3. Should endovenous ablation of small diameter great saphenous veins be performed on patients with symptomatic varicose veins?

Steven Perrins, Andrew Cha, Dahlia Plummer, Richard Hsu, Alan M. Dietzek
Surgery, Danbury Hospital, Danbury, CT.

OBJECTIVES: The efficacy of radiofrequency ablation (RFA) for symptomatic varicose veins is well established. Alternatively, there is less consensus and little data on outcomes when treating great saphenous veins (GSV) of small diameter (≤ 5 mm). To this point, there are national insurance carriers that deny coverage for endovenous ablation for patients with small GSV citing lack of proven benefit. The purpose of this study is to assess clinical and anatomical outcomes of RFA on small diameter, symptomatic GSV at 3 months.

METHODS: A retrospective analysis was performed of our patients who received RFA of incompetent GSV without any concomitant adjunctive procedures between January 2008 and December 2011. Limbs with a maximum GSV thigh diameter ≤ 5 mm on duplex while standing were subject to review. Clinical success was defined as an improvement in Venous Clinical Severity Score (VCSS) at 3 months. Anatomic success was defined as absence of venous flow ≤ 3 cm distal to the saphenofemoral junction (SFJ) on duplex ultrasound examination. Changes in CEAP class were noted.

RESULTS: In 307 patients, 54 limbs in 44 patients met inclusion criteria. Baseline median VCSS was 4 (interquartile range 4, 5). Clinical success was seen in 83% of limbs at 3 months with a median VCSS change of -2 (IQR -3, -1). None of the treated limbs had phlebectomy for symptomatic varicosities prior to 3 month follow-up. One phlebectomy was performed for cosmesis at 78 days post procedure. Anatomic success was achieved in 96% of limbs at 3 months. Baseline median CEAP was 2 (IQR 2, 2). The median CEAP change at 3 months was 0 (IQR -1, 0). The only complication was a thrombus extension into the SFJ at 4 days.

CONCLUSIONS: In our experience, RFA of symptomatic small diameter GSV provides comparable clinical and anatomic outcomes to that of current published data. Our findings suggest that these patients benefit clinically from the RFA procedure and should not be denied this treatment based upon vessel diameter alone.

AUTHOR DISCLOSURES: A. Cha: Nothing to disclose; A. M. Dietzek: Covidien, Speaker's bureau; R. Hsu: Nothing to disclose; S. Perrins: Nothing to disclose; D. Plummer: Nothing to disclose

9:45 am

PVSS4. Implementation of the Screen For Abdominal Aortic Aneurysms Very Efficiently (SAAAVE) Act: A Five-Year Follow Up

Kevin C Chun, BS, Kai Y Teng, BS, Elyse N Van Spyk, BS, John G Carson, MD, Eugene S Lee, MD, PhD

University of California, Davis and Sacramento VA Medical Center; Sacramento, CA US

OBJECTIVES: In 2007, Medicare guidelines were established to identify persons at risk for the presence of an abdominal aortic aneurysm (AAA). The purpose of this study was to evaluate the implementation of the SAAAVE Act in identifying patients at risk for AAA within a 5-year period in clinical practice.

METHODS: Data was extracted from a regional Veterans Affairs Healthcare Network to identify all veteran males 65-75 years of age who smoked greater than 100 cigarettes during their lifetime. In 2007, a AAA screening mandate was implemented allowing patients meeting screening criteria to be evaluated for AAA as part of the patient's health maintenance. AAA is identified as an aortic diameter size of 3.0 cm or greater. Clinician adherence to screening protocols and timely referral for aneurysms greater than 5.5 cm were also evaluated.

RESULTS: A total of 9,788 patients (71.5 ± 5.6 years of age) were screened for an AAA over a 5 year period from January 1, 2007 to December 31, 2011. A total of 698 aneurysms (7.1%) were found (See Table). Timely referrals were made on 44 patients with aneurysms greater than 5.5 cm. A total of 2,828 patients (28.9%) were inappropriately screened: 421 patients were too young, 2,250 patients were too old, 36 patients were women, and 121 patients without aneurysms had multiple screenings.

CONCLUSIONS: The long implementation of the AAA screening has allowed greater deviation from Medicare guidelines that increased the number of inappropriate screenings, mandating further AAA screening education for primary care providers.

AUTHOR DISCLOSURES: Kevin C Chun, BS, Kai Y Teng, BS, Elyse N Van Spyk, BS, John G Carson, MD, Eugene S Lee, MD, PhD

Total Aneurysms	698/9,788	7.1%
3.0 - 3.9 cm	460/9,788	4.7%
4.0 - 4.9 cm	146/9,788	1.5%
5.0 - 5.4 cm	47/9,788	0.5%
5.5 cm <	45/9,788	0.5%

10:30 am

PVSS5. Is Depression a Risk Factor for Peripheral Arterial Disease? Insights from the Heart and Soul Study

Marlene Grenon, Hade Hiramoto, Eric Vittinghoff, Mary Whooley, Beth Cohen
UCSF, San Francisco, CA.

OBJECTIVES: Risk factors for peripheral artery disease (PAD) are tightly linked to those for coronary artery disease (CAD). Although depression is known to increase risk of CAD, fewer studies have evaluated depression and PAD. We examined the association of depression with prevalent PAD and with prospective PAD events, and evaluated potential mediators of these associations.

METHODS: We used data from the Heart and Soul Study, a prospective cohort of 1,024 men and women with CAD recruited in 2000-2002 and followed for a mean of 7.2 years. Depression was assessed with the validated nine-item Patient Health Questionnaire. Prevalent PAD at baseline was determined by self-report. Prospective PAD events were adjudicated based on physician diagnosis, radiological imaging and/or need for PAD surgery. We used logistic and Cox models to estimate the independent associations of depression with prevalent PAD at baseline and subsequent PAD events, adjusting for potential mediators of these associations.

RESULTS: At baseline, depression affected 19% of patients. Prevalent PAD was reported by 12.1% of patients with depression and 7.3% of those without (age-adjusted OR 1.79, 95% CI 1.06-3.03, $p=0.03$). In age-adjusted models, physical inactivity, diabetes, and CRP level each explained more than 5% of the association between depression and prevalent PAD. During follow-up, PAD events occurred in 9% of patients with depression and 6% of those without (age-adjusted HR 1.77, 95% CI 1.02-3.07, $p=0.04$). Factors explaining more than 5% of the association between depression and incident PAD events included inactivity, diabetes, prevalent PAD, race/ethnicity, smoking, HDL, and triglyceride levels.
CONCLUSIONS: Depression was associated with a greater risk of PAD, providing evidence that depression is an important risk factor for the development of PAD. Since elevations in traditional, modifiable cardiovascular risk factors partially explain these associations, such risk factors should be assessed and aggressively treated.

AUTHOR DISCLOSURES: **B. Cohen:** Nothing to disclose; **M. Grenon:** Nothing to disclose; **H. Hiramoto:** Nothing to disclose; **E. Vittinghoff:** Nothing to disclose; **M. Whooley:** Nothing to disclose

10:45 am

PVSS6. In Vivo Assessment of Endothelial Function in Human Lower Extremity Arteries

Vikram S. Kashyap¹, Ryan O. Lakin¹, Lindsay Feiten², Paul Bishop², Timur P. Sarac²

¹University Hospitals Case Medical Center, Cleveland, OH; ²Cleveland Clinic, Cleveland, OH.

OBJECTIVES: Endothelial function has been measured in human brachial and coronary arteries, but not in lower extremity arteries affected by atherosclerosis. We describe a novel, first-in-man, evaluation of endothelial function in patients with peripheral arterial disease (PAD) of the superficial femoral arteries (SFA).

METHODS: Patients with PAD (n=25) requiring lower extremity angiography were enrolled. Endothelial dependent relaxation (EDR) was measured using intravascular ultrasound and a Doppler Flow wire after acetylcholine infusion (Ach). IVUS derived virtual histology (IVUS-VH) of the same vessel was calculated. Endothelial independent relaxation (EIR) was measured with infusion of nitroglycerin

(NTG, 200 ug).

RESULTS: Patients (mean age 62, 48% male) had a history of hypertension (80%), coronary disease (32%), and diabetes (56%). The mean SFA diameter was 5.2 ± 0.99 mm (range 3.2-6.9 mm). EDR increased over baseline for all patients with Ach infusion 10^{-6} - 10^{-4} . Diameter (0.5% at Ach 10^{-4}) and area (1.83% at Ach 10^{-4}) changes in the diseased SFA were modest. But, average velocity of blood flow (APV) significantly increased 26.2, 46 and 63% with Ach infusion 10^{-6} - 10^{-4} . Calculations of blood flow (mm^2/sec , 67% change, Ach 10^{-4}) and limb volume flow (mm^3/sec , 68.1%, Ach 10^{-4}) were performed. Lower extremity NOx levels approximated systemic venous levels (P=0.6). NTG infusion indicated normal smooth muscle responsiveness (3.3% diameter, 8.9% area, and 116% velocity change over baseline). IVUS-VH plaque stratification indicated predominantly fibrous morphology (45.5%; necrotic core, 28.9%; calcium, 18.2%). Atheroma burden was 14.89 ± 5.5 mm^3/cm and did not correlate with endothelial responsiveness.

CONCLUSIONS: Endothelial function can be measured directly in human lower extremity arteries. Despite extensive atherosclerosis, endothelial function is still intact. These data support the application of regional endothelial-specific biological therapies in patients with PAD.

AUTHOR DISCLOSURES: **P. Bishop:** Nothing to disclose; **L. Feiten:** Nothing to disclose; **V. S. Kashyap:** NIH, AVA, Research Grants; **R. O. Lakin:** Nothing to disclose; **T. P. Sarac:** Nothing to disclose

11:00 am

PVSS7 Primary Angiosarcoma of the Aorta and Great Vessels

Javairiah Fatima, MD, Audra A Duncan, MD, Gustavo S Oderich, MD, Peter Gloviczki, MD, Manju Kalra, MD, McKusick Michael, MD, Thomas C Bower, MD

Mayo Clinic, Rochester, MN US

OBJECTIVES: Primary angiosarcomas originating from the heart, aorta or the great vessels are extremely rare, and hence poorly understood. We reviewed our experience to identify a preferred diagnostic and treatment strategy, and evaluate role of adjunctive therapy.

METHODS: We reviewed the clinical data of all patients diagnosed with primary angiosarcoma of the heart, aorta, and great vessels from 1985 to 2011, including presentation, diagnosis, management, and outcomes.

RESULTS: Thirteen patients (5 males and 8 females; mean age, 54 ± 4 years) had primary angiosarcoma arising from the aorta (n=7), heart (n=3), pericardium (n=2), and pulmonary artery (n=1). Aortic tumors most commonly presented with lower extremity claudication (n=4), renovascular HTN (n=3), abdominal pain (n=5), and weight loss (n=4). Cardiac and pericardial tumors presented with dyspnea (n=5) due to pleural effusion or cardiac tamponade. All 13 patients underwent Computed Tomography (CT) scan demonstrating irregular, lobulated mass/thrombus with peripheral enhancement and 8 patients had diagnostic echocardiogram. Metastatic disease was present in 10 patients; most common site was lungs (n=6). All except one patient had high grade sarcoma on pathology. Most common endothelial antigen was CD31. Nine patients were treated surgically; resection with aortic reconstruction (n=6), thrombectomy (n=1), and pericardiectomy with patch (n=2). Adjunctive treatment included chemotherapy (n=7) and radiation (n=4). Median survival was 8 months (range 1-75). Patients treated with all 3 treatment modalities had longer survival than patients treated with a single modality (p=0.013). Patients treated with chemotherapy had a more favorable survival than those without chemotherapy (p=0.048).

CONCLUSIONS: Primary angiosarcoma of the heart and great vessels is rare, but a harbinger of poor prognosis. Endothelial antigen CD31 is diagnostic. Combined therapy with surgical resection and chemoradiotherapy offer patients the best survival.

AUTHOR DISCLOSURES: Javairiah Fatima, MD, Audra A Duncan, MD, Gustavo S Oderich, MD, Peter Gloviczki, MD, Manju Kalra, MD, McKusick Michael, MD, Thomas C Bower, MD

11:15 am

PVSS8. Ulcer Healing and Prevention of Limb Loss following Endovascular Tibial Artery Interventions in patients presenting with tissue loss

Javier E. Anaya-Ayala, Mitul S. Patel, Matthew K. Adams, Christopher J. Smolock, Joseph J. Naoum, Jean Bismuth, Eric K. Peden, Alan Lumsden, Mark G. Davies

Cardiovascular Surgery, Methodist DeBakey Heart & Vascular Center, Houston, TX.

OBJECTIVES: To examine the outcomes of tibial endovascular interventions with respect to ulcer healing and prevention of major limb loss.

METHODS: A database of patients between 2001 and 2011 was queried. Patients presenting with tissue loss (Rutherford class 5 and 6) were selected. Immediate success of the intervention was defined as healing of the ulcer or a successful forefoot amputation after intervention. Clinical efficacy was defined as absence of recurrent symptoms, maintenance of ambulation and absence of major amputation.

RESULTS: : 248 limbs in 245 patients (60% male, mean age 67) underwent tibial artery interventions for tissue loss. 68% had diabetes, 63% hyperlipidemia and 24% chronic renal insufficiency. The mean patent tibial vessels at presentation were 1.2 ± 0.6 (SD). 76% of the tibial lesions were TASC C. Technical success was 98% with a mean of 2 vessels treated per patient. 388 tibials were treated. Overall mortality was 1% and overall morbidity was 14% at 90 days after the procedure. 76% of ulcers healed after the intervention at a mean of 9 months. 34% required either toe or trans-metatarsal amputation, while 24% of the limbs underwent major amputation. Cumulative patency was $68 \pm 5\%$ at five years. 31% of patients necessitated two or more re-interventions. At 5 years, freedom from ulcer recurrence and major limb amputations were $54 \pm 4\%$ and $48 \pm 6\%$, respectively. Clinical efficacy was $34 \pm 4\%$ at 5 years. On Cox proportional hazard analysis, greater tissue loss at presentation, BMI > 30, diabetes, hemodialysis, low mobility at presentation, higher tibial TASC lesion and poor pedal runoff were associated with decreased ulcer healing and lower limb salvage.

CONCLUSIONS: Tibial interventions do allow for ulcer healing within one year with a low mortality and morbidity; however, one in four patients will require a major amputation within 5 years.

AUTHOR DISCLOSURES: **M. K. Adams:** Nothing to disclose; **J. E. Anaya-Ayala:** Nothing to disclose; **J. Bismuth:** Nothing to disclose; **M. G. Davies:** Nothing to disclose; **A. Lumsden:** Nothing to disclose; **J. J. Naoum:** Nothing to disclose; **M. S. Patel:** Nothing to disclose; **E. K. Peden:** Nothing to disclose; **C. J. Smolock:** Nothing to disclose

11:30 am

PVSS9. Do closure devices prevent surgical complications?

Jason Q. Alexander, Kate Zimmerman, Andrew Cragg, Peter Alden, John Graber, Adnan Rizvi, Alex Tretinyak, Timothy Sullivan

Vascular and Endovascular Surgery, Minneapolis Heart Institute, Minneapolis, MN.

OBJECTIVES: Evaluate whether closure devices (CD) are a safe method for preventing surgical complications associated with femoral access. As a secondary goal, the use of ultrasound for femoral access and performance of an adequate completion angiogram prior to CD deployment were evaluated.

METHODS: All patients at a tertiary care facility that underwent femoral arterial access from January 2009 to July 2011 were reviewed. Arterial complications that resulted in operative repair during hospitalization were identified. Cases were separated into those utilizing CD and those employing manual compression (MC). The two groups were evaluated for demographic and procedural differences. The subgroup of patients that underwent CD placement were then evaluated for ultrasound use and performance of adequate completion angiogram.

RESULTS: 11,114 cases were reviewed. CD were placed in 5576 (50.2%) while MC was used in 5538 (49.8%). Surgical complications were identified in 30 (0.54%) of CD cases and 26 (0.47%) of MC cases (p=0.61). Demographic data and procedural data was not statistically significant between the two groups except for younger average age in the CD subset (p= 0.032).

Amongst the 30 surgical complications employing CD, 7 patients (23.3%) were found to have access in the wrong vessel. Ultrasound was utilized in 4/30 cases (13.3%). Completion angiograms were not recorded in 12/30 (40%) of cases. In 11/18 cases (61%) completion angiograms were determined to be inadequate for placement of a CD.

CONCLUSIONS: Our data suggests that use of CD following femoral artery access does not decrease the rate of surgical complications compared with MC. Demographic and procedural factors did not appear to influence the complication rate. In 10/30 (33.3%) cases the wrong vessel was accessed or a device was deployed in an inadequate vessel by completion angiography. Unless, factors can be employed to decrease the rate of complications, we cannot justify the use of CD in the prevention of surgical complications.

AUTHOR DISCLOSURES: **P. Alden:** Nothing to disclose; **J. Q. Alexander:** Nothing to disclose; **A. Cragg:** Nothing to disclose; **J. Graber:** Nothing to disclose; **A. Rizvi:** Nothing to disclose; **T. Sullivan:** Nothing to disclose; **A. Tretinyak:** Nothing to disclose; **K. Zimmerman:** Nothing to disclose

11:45 am

PVSS10. Temporary distal vessel occlusion using reversible Thermo-Sensitive polymer in Infra-popliteal bypasses for severe leg ischemia

Hany Zayed, Jennifer Fitzpatrick, Anwar Ahmad, Bijan Modarai, Hisham Rashid

Vascular Surgery, Kings Health Partners, London, United Kingdom.

OBJECTIVES: We report our experience with the use of a novel Thermo-Sensitive Polymer (LeGoo) for distal vessel control during Infra-Popliteal Bypasses (IPB) in patients with severe leg ischemia

METHODS: Retrospective analysis of all IPB procedures performed using LeGoo from January 2010 till April 2011. We specifically looked at technical success in achieving bloodless anastomotic field, intraoperative LeGoo-related complication and re-intervention for anastomosis-related lesion during follow-up

RESULTS: Thirty-four IPBs using LeGoo were performed during the study period. The distal anastomosis was performed to the Anterior tibial artery (n.=9), Posterior tibial artery (n.=7), Peroneal artery (n.=5), Tibio-Peroneal trunk (n.=6) and Dorsalis Pedis artery (n.=7). Follow-up period ranged from 4 to 24 months. They were all enrolled in a duplex graft surveillance programme and were offered intervention for threatened grafts. Twenty-three patients completed at least 1 year follow-up. Bloodless anastomotic field was achieved in 32 patients. One patient needed a Fogarty catheter-assisted retrieval of the occlusive polymer plug for the outflow vessel. Five patients needed salvage angioplasty, 2 of them for a distal anastomosis-related stenosis. Four grafts occluded during follow-up, one was successfully thrombolysed and 2 patients had a major amputation.

CONCLUSIONS: LeGoo is a potentially safe and useful device to achieve a bloodless distal anastomotic

filed in patients undergoing IPBs. This may be particularly important in constructing the anastomosis to a calcified distal vessel. A large randomised controlled study is needed to support our findings.

AUTHOR DISCLOSURES: **A. Ahmad:** Nothing to disclose; **J. Fitzpatrick:** Nothing to disclose; **B. Modarai:** Nothing to disclose; **H. Rashid:** Nothing to disclose; **H. Zayed:** Nothing to disclose

12:00 pm 2011 PVSS Academic Award Report

Faculty

Guillermo A. Escobar, University of Michigan, Ann Arbor, MI
Contrast Induced Nephropathy Animal Model

12:10 pm 2011 PVSS Academic Award Report

Fellow

Bjoern Suckow, University of Utah, Salt Lake City, UT
Development of a disease specific quality-of-life measure for patients with critical limb ischemia

12:20 pm 2011 PVSS Traveling Award Report

Judith C. Lin, Henry Ford Hospital, Detroit, MI

Wednesday, June 06

1:30 pm - 5:00 pm

V2: Peripheral Vascular Surgical Society Paper Session II

**Moderators: Jonathan Eliason
Ravi Veeraswamy**

1:30 pm

PVSS11. Outcomes of ischemic colitis after hybrid endovascular repair of complex aortic aneurysms in the North American Complex Abdominal Aortic Debranching (NACAAD) Registry

Carlos H. Timaran¹, Gustavo S. Oderich², Mark A. Farber³, William Quinones-Baldrich⁴, Peter Gloviczki², Guillermo Escobar⁵, Roy K. Greenberg⁶, James Black⁷, Sharif Ellozy⁸, Edward Woo⁹, Michael Singh¹⁰, Mark Fillinger¹¹, Jason Lee¹², Hasan H. Dosluoglu¹³

¹Univ of Texas Southwestern Med Ctr, Dallas, TX; ²Mayo Clinic, Rochester, MN; ³Univ of North Carolina, Chapel Hill, NC; ⁴Univ of California, Los Angeles, CA; ⁵Univ of Michigan, Ann Arbor, MI; ⁶Cleveland Clinic, Cleveland, OH; ⁷Johns Hopkins Med Ctr, Baltimore, MD; ⁸Mount Sinai School of Medicine, New York, NY; ⁹Univ of Pennsylvania Med Ctr, Philadelphia, PA; ¹⁰Univ of Rochester Med Ctr, Rochester, NY; ¹¹Dartmouth-Hitchcock Med Ctr, Lebanon, NH; ¹²Stanford Univ Med Ctr, Stanford, CA; ¹³State Univ of New York, Buffalo, NY.

OBJECTIVES: The purpose of this study was to describe the frequency, predictors and outcomes of ischemic colitis after abdominal debranching combined with aortic stent grafts (ADSG) used to treat pararenal (PRA) and thoracoabdominal aortic aneurysms (TAAAs).

METHODS: We reviewed clinical data of 208 patients treated by ADSG in 13 North American academic centers between 1999-2010. Ischemic colitis was identified by colonoscopy and/or operative findings. End-points included need for colon resection, morbidity and mortality. Predictive factors for ischemic colitis were identified using univariate and multivariate logistic regression analysis.

RESULTS: 118 male and 90 female patients (mean age, 72±10 years) were treated for 45 PRA and 163

TAAAs. ADSG required reconstruction of 468 vessels (2.8/ patient) done in a single stage in 92 patients (44%). Ischemic colitis occurred in 13 patients (6%) and transmural necrosis requiring colon resection in 4(2%). Thirty-day mortality was 14% for the entire cohort, and was significantly higher among patients with ischemic colitis (46%[6/13] vs 12%[24/195]; P<0.05), including those who required colon resection (50%). By univariate analysis, age, Society for Vascular Surgery (SVS) comorbidity score, chronic kidney disease, symptomatic or ruptured aneurysm and single-stage operation were associated with significantly higher rates (P<0.05) of ischemic colitis. Independent predictors for ischemic colitis included age (OR 1.12, 95%CI 1.02-1.24), SVS comorbidity score (OR 1.02; 95%CI 1.00-1.04) and single-stage operation (OR 1.3, 95%CI 1.25-1.37)(P<0.01). Patient survival at 1-year was significantly decreased among patients who had ischemic colitis compared to those who did not have this complication (51% vs 79%, P<0.003).

CONCLUSIONS: Ischemic colitis after ADSG is a devastating complication that carries high mortality (44%) and occurs more frequently in patients with advanced age, significant medical comorbidities and in those undergoing a single-stage operation.

AUTHOR DISCLOSURES: **J. Black:** Nothing to disclose; **H. H. Dosluoglu:** Nothing to disclose; **S. Ellozy:** Nothing to disclose; **G. Escobar:** Nothing to disclose; **M. A. Farber:** Nothing to disclose; **M. Fillinger:** Nothing to disclose; **P. Gloviczki:** Nothing to disclose; **R. K. Greenberg:** Cook Inc., Consulting fees or other remuneration (payment); **J. Lee:** Nothing to disclose; **G. S. Oderich:** Nothing to disclose; **W. Quinones-Baldrich:** Nothing to disclose; **M. Singh:** Nothing to disclose; **C. H. Timaran:** W.L. Gore & Assoc, Consulting fees or other remuneration (payment); **E. Woo:** Nothing to disclose

1:45 pm

PVSS12. Early and Late Outcomes After Open Thoracic and Thoracoabdominal Aortic Aneurysm Repair in Young Patients

Nanette R. Reed, Manju Kalra, Gustavo Oderich, Audra A. Duncan, Thomas C. Bower, Peter Gloviczki
Vascular Surgery, Mayo Clinic Rochester, Rochester, MN.

OBJECTIVES: Thoracic (TAA) and thoracoabdominal aortic aneurysms (TAAA) in young patients are rare. The aim of this study is to evaluate short and longterm outcomes following elective open TAA/TAAA repair in patients <50 years of age

METHODS: Data from 716 consecutive patients undergoing elective TAA/TAAA repair from 1971 to 2011 were analyzed retrospectively. Seventy-two patients were identified. Acute traumatic transection or acute dissection were exclusion criteria.

RESULTS: There were 50 males and 22 females (median age 41 years; range 14 -50) with 40 TAA, 2 Crawford Type I, 13 Type II, 14 Type III, and 3 Type IV TAAAs. Twenty-seven (38%) aneurysms were secondary to CTDs; the remainder were degenerative (n=22), post-traumatic (n=13), or the result of a congenital abnormality (n=10). Chronic dissection occurred in 29 patients. Median aneurysm diameter was 6.0 cm. All patients underwent open surgical repair through a left thoracic/thoracoabdominal approach. There were no early post-operative deaths. Major complications developed in 31 (43%), including cardiac (n=6), renal (n=6), paraplegia (n=3), and cerebral ischemia (n=3). Median hospital length of stay was 8 days (range 4-40). Median follow-up was 5.8 years (range 10 days-33 years). Twenty-eight patients (39%) had prior aortic surgery. Eighteen (25%) patients required aortic re-intervention; anastomotic aneurysm repair (n=5), patch aneurysm repair (n=3), ascending or aortic arch repair (n=8), and abdominal aortic repair (n=5). These subsequent repairs were associated with a 22% (4/18) early mortality. On univariate analysis, the incidence of re-intervention was significantly higher in

patients with CTD ($p=0.01$). One, 5 and 10 year survival rates were 95.8%, 91.6%, and 86.1% respectively.

CONCLUSIONS: Young patients who undergo open TAAA repair have favorable short and long-term outcomes. However, a significant proportion require further aortic intervention and imaging surveillance is advised, especially in those with CTD.

AUTHOR DISCLOSURES: **T. C. Bower:** Nothing to disclose; **A. A. Duncan:** Nothing to disclose; **P. Glociczki:** Nothing to disclose; **M. Kalra:** Nothing to disclose; **G. Oderich:** Nothing to disclose; **N. R. Reed:** Nothing to disclose

2:00 pm

PVSS13. Anatomic Characteristics of Aortic Transection: Centerline Analysis to Facilitate Emergent Repair

Ravi R. Rajani, Laura S. Johnson, Brian L. Brewer, Luke P. Brewster, Matthew A. Corriere, Yazan Duwayri, James G. Reeves, Joseph J. Ricotta, Ravi K. Veeraswamy, Thomas F. Dodson

Department of Vascular Surgery, Emory University, Atlanta, GA.

OBJECTIVES: Traumatic transection of the thoracic aorta is being treated increasingly with the use of aortic stent grafting. Unfortunately, most stent grafts are designed for treating aortic aneurysmal disease instead of traumatic injury. Further refinements in stent graft technology depend on a thorough anatomic understanding of the transection process.

METHODS: All patients with computed tomography evidence of blunt aortic injury between 2003 and 2011 were queried. Their initial scans were imported into the Intuition (Terarecon, Inc) viewing program, and off-line centerline reconstruction was performed. Standard demographic data was collected in addition to anatomic characteristics, including aortic diameters and relation of the injury to the arch vessels.

RESULTS: 52 patients were identified. Only 2 patients had evidence of injury proximal to the left subclavian artery. The average length from the left subclavian artery to the proximal site of injury was 16.2 mm (range 2-31 mm). Most patients (40) had more than 15 mm of landing zone beyond the left subclavian artery. The range of proximal diameters ranged from 19-32 mm, with an average aortic diameter of 23.7 mm. Five patients had aortic diameters smaller than 21 mm, and five patients had aortic diameters greater than 26 mm. The average length of injured aortic segment was 27 mm.

CONCLUSIONS: In this contemporary series from a large trauma center, 98% of patients are anatomically able to be treated with a stent graft that does not require coverage of the left common carotid artery. Furthermore, 80% of patients were anatomically able to be treated without left subclavian artery coverage. Most patients have an aortic diameter that falls between 21 and 26 mm in diameter as well as a short segment of injured artery. Centers interested in emergently treating aortic transections are able to do so while maintaining a limited stock of stent grafts that can be used to treat the majority of the population.

AUTHOR DISCLOSURES: **B. L. Brewer:** Nothing to disclose; **L. P. Brewster:** Nothing to disclose; **M. A. Corriere:** Nothing to disclose; **T. F. Dodson:** Nothing to disclose; **Y. Duwayri:** Nothing to disclose; **L. S. Johnson:** Nothing to disclose; **R. R. Rajani:** Nothing to disclose; **J. G. Reeves:** Nothing to disclose; **J. J. Ricotta:** Nothing to disclose; **R. K. Veeraswamy:** Nothing to disclose

2:15 pm

PVSS14. Gender differences in aortic aneurysm presentation, repair, and mortality in the VSGNE
 Ruby C. Lo¹, Rodney P. Bensley¹, Allen D. Hamdan¹, Mark Wyers¹, Elliot Chaikof¹, Julie E. Adams²,
 Marc L. Schermerhorn¹

¹Vascular Surgery, BIDMC, Boston, MA; ²University of Vermont College of Medicine, Burlington, VT.

OBJECTIVES: Prior studies examining gender differences in AAA repair suggest there may be differences in presentation, suitability for EVAR, and outcomes between men and women.

METHODS: We used the Vascular Study Group of New England database to identify all patients undergoing EVAR or open AAA repair (OAR). We analyzed demographics, comorbidities, and procedural, and perioperative data. Results were compared using Fisher's exact test.

RESULTS: 4,193 patients underwent AAA repair (78% male, 54% EVAR). Women were less likely to undergo EVAR for intact aneurysms (50% vs. 60% of, p<.001) but not for ruptured aneurysms (27% vs. 21%, p=.25). Women were older (74 years vs. 72 years for intact, p<.001; 77.5 years vs. 73 years for rupture, p<.001) with smaller aortic diameters (56mm vs. 59mm for elective, p<.001; 71mm vs. 78mm for rupture, p=.005). Women had higher 30-day mortality after OAR for both intact (4% vs. 2%, p=.05) and rupture (48% vs. 33%, p=.03) repairs. However, 30-day mortality after EVAR was similar for both intact (1% in men vs. 1% in women, p=.58) and rupture (29% in men vs. 26% in women, p=1.00) repairs.

CONCLUSIONS: Women are undergoing EVAR at a higher rate than previously reported, being treated at older ages and smaller diameters, and rupture at smaller diameters than men. Thirty-day mortality is worse in women after OAR but comparable after EVAR.

AUTHOR DISCLOSURES: **J. E. Adams:** Nothing to disclose; **R. P. Bensley:** Nothing to disclose; **E. Chaikof:** Nothing to disclose; **A. D. Hamdan:** Nothing to disclose; **R. C. Lo:** Nothing to disclose; **M. L. Schermerhorn:** Endologix, Consulting fees or other remuneration (payment) Medtronic, Consulting fees or other remuneration (payment) Boston Scientific, Consulting fees or other remuneration (payment); **M. Wyers:** Nothing to disclose

		EVAR			OAR		
		Male (n=1,820)	Female (n=453)	p- value	Male (n=1,436)	Female (n=484)	p- value
Age (years), median	All	74	77	<.001	71	73	<.001
	Intact	74	76	<.001	70	73	<.001
	Ruptured	72	78	<.001	73	77	<.001
AAA diameter (mm), mean	All	58.4	56.6	.004	64.7	59.7	<.001
	Elective	57.2	55.4	<.001	60.8	57.3	<.001
	Symptomatic	65.4	62.5	0.39	69.3	65.4	.24
	Ruptured	75.3	72.4	0.56	79.1	70.8	.004
30-day mortality (%)	All	2	2	0.46	8	9	.39
	Intact	1	1	.58	2	4	.05

	Ruptured	29	26	1.00	33	48	.03
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2:30pm

PVSS15. Outcomes Following Tevar for Acute Type B Aortic Dissection

James Sampson, MD, Marjan Mujib, MD, MPH, Mark A Patterson, MD, Marc A Passman, MD, Thomas C Matthews, MD, William D Jordan, MD

University of Alabama at Birmingham, Birmingham, AL US

OBJECTIVES: To review clinical outcomes of endovascular treatment of type B aortic dissection.

METHODS: All patients treated for type B aortic dissection between 2006-2011 were identified from a prospectively maintained registry. Health systems charts and medical correspondences were reviewed. Measured outcomes included resolution of the indication for intervention, additional procedures, and survival at 30 days and 1 year.

RESULTS: 55 patients were treated with TEVAR for type B dissection (mean age, 61±14 years), 39 (71%) for acute dissections and 16 (29%) for chronic dissections. Indications for treatment were pain (21), malperfusion (13), aneurysm (6), uncontrolled hypertension (6), expansion (5), and rupture (4). Success, defined by relief of indication and freedom from death or re-intervention at 30 days, was achieved in 87% of patients. Twenty-six additional procedures were performed in 22 patients prior to, or at the time of TEVAR. These included debranching procedures (8), renal stenting (7), Iliac stenting (5), iliac exposure or conduit creation (2), mesenteric stenting (2), thrombectomy (1), and tube thoracostomy(1). Left subclavian artery coverage was required in 23 patients. Spinal ischemia occurred in 4 patients, and lumbar drainage performed in 2 patients. Three patients required reintervention during the study period. Survival was 93% at thirty-days and 78% at one year.

CONCLUSIONS: TEVAR is effective in the treatment of the complications of both acute and chronic type B aortic dissection. Additional procedures are frequently necessary, but early results indicate favorable outcomes, while re-intervention is rare.

AUTHOR DISCLOSURES: James Sampson, MD, Marjan Mujib, MD, MPH, Mark A Patterson, MD, Marc A Passman, MD, Thomas C Matthews, MD, William D Jordan, MD

2:45 pm

PVSS16. Perioperative Use of Dextran is associated with Cardiac Complications after Carotid Endarterectomy

Alik Farber¹, Tze-Woei Tan¹, Jeffrey Kalish¹, Naomi M. Hamburg¹, Robert Eberhardt¹, Gheorghe Doros¹, Denis V. Rybin¹, Philip P. Goodney², Jack L. Cronenwett², Vascular Study Group of New England For The¹

¹*Boston Medical Center/ Boston University School of Medicine and Public Health, Boston, MA;*

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OBJECTIVES: Although dextran has been theorized to diminish the risk of stroke after carotid endarterectomy(CEA) variation exists in its use. We evaluated outcomes of dextran use in patients undergoing CEA to clarify its utility.

METHODS: We studied all primary CEA performed by 71 surgeons within the Vascular Study Group of New England database (2003-2010). Patients were stratified by perioperative dextran use. Outcomes

included perioperative death, stroke, myocardial infarction(MI) and congestive heart failure(CHF). Group and propensity score matching were performed for risk adjusted comparisons, and multivariable logistic regression was used to examine associations between dextran use and outcomes.

RESULTS: There were 6,641 CEA performed, with dextran used in 334(5%) procedures. Dextran and No Dextran patients were similar in age(70 years) and symptomatic status(25%). Other differences between the cohorts diminished after adjustment(Table). In crude, group-matched, and propensity matched analyses, stroke/death rate was similar between cohorts (1.2%),while Dextran patients were more likely to suffer perioperative MI(2.4% vs 1.0%;p=.029) and CHF(2.1% vs 0.6%;p=.005). In multivariate analysis, dextran was associated with a higher risk of perioperative MI(OR 5.2,CI:1.9-14.4;p=0.002) and CHF(OR 5.9,CI:1.9-18.5;p=0.002).

CONCLUSIONS: Dextran use was not associated with perioperative stroke but was associated with higher rates of MI and CHF. Taken together, our findings suggest limited clinical utility for dextran.

AUTHOR DISCLOSURES: **J. L. Cronenwett:** Nothing to disclose; **G. Doros:** Nothing to disclose; **R. Eberhardt:** Nothing to disclose; **A. Farber:** Nothing to disclose; **V. For The:** Nothing to disclose; **P. P. Goodney:** Nothing to disclose; **N. M. Hamburg:** Nothing to disclose; **J. Kalish:** Nothing to disclose; **D. V. Rybin:** Nothing to disclose; **T. Tan:** Nothing to disclose

	Crude Sample			Group Matched Sample			Propensity Matched Sample		
	Dextran, % (n=443)	No Dextran, % (n=6397)	p-value	Dextran, % (n=333)	No Dextran, % (n=1523)	p-value	Dextran, % (n=334)	No Dextran, % (n=1670)	p-value
Characteristics									
General Anesthesia	74.3	88.9	<0.001	74.5	79.3	0.06	74.3	73.5	0.84
Eversion	19.2	10.0	<0.001	19.2	24.7	0.03	19.2	19.2	0.99
Shunt	18.9	48.6	<0.001	18.9	20.1	0.65	18.9	23.2	0.10
Outcomes									
Stroke or Death	1.2	1.0	0.58	1.2	0.6	0.27	1.2	0.7	0.32
MI	2.4	1.0	0.03	2.4	0.6	0.005	2.4	0.5	0.003
CHF	2.1	0.6	0.005	2.1	0.5	0.006	2.1	0.2	<0.001

3:00 pm

PVSS17. The impact of Centers for Medicaid & Medicare Services (CMS) high risk (HR) criteria on outcome after Carotid Endarterectomy (CEA) and Carotid Artery Stenting (CAS) in the SVS Vascular Registry™ (VR)

Marc L. Schermerhorn¹, Philip P. Goodney², Ellen D. Dillavou³, Jeffrey Jim⁴, Christopher T. Kenwood⁵, Flora S. Siami⁵

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OBJECTIVES: CMS requires high risk criteria for CAS reimbursement. The impact of these criteria on outcomes remains uncertain, potentially biasing comparative effectiveness analysis. We evaluate this using data from the SVS Vascular Registry™.

METHODS: We analyzed 10,107 patients undergoing CEA (6,370) and CAS (3,737). Patients were stratified by CMS high risk (HR) criteria. The primary endpoint was composite death, stroke and MI (MACE) at 30 days.

RESULTS: CAS patients were more likely to have preoperative stroke (26 v 21%) or TIA (23 v 19%) than CEA. While age ≥80years was similar, CAS had higher prevalence of all other HR criteria. For CEA, HR patients had higher MACE than normal risk: SX (7.3 v 4.6%, p<.01) and ASX (5 v 2.2%, p<.0001). For CAS there was no difference: SX (9.1 v 6.2%, p=.24) or ASX (5.4 v 4.2%, p=.61) All CAS patients had MACE rates similar to HR CEA. After risk adjustment, CAS had higher rates than CEA for MACE (OR 1.2, 95%CI 1.0-1.5), death (1.5, 1.0-2.2) and stroke (1.3, 1.0-1.7), while there was no difference in MI (OR 0.8, 0.6-1.3). Multivariate analyses for predictors of MACE are reported in Table 1. Radiation and restenosis were protective for MACE from CAS.

CONCLUSIONS: CEA is safer in the majority of patients with carotid disease. Normal risk CAS may be confined to restenosis and radiation.

AUTHOR DISCLOSURES: E. D. Dillavou: Nothing to disclose; P. P. Goodney: Nothing to disclose; J. Jim: Nothing to disclose; C. T. Kenwood: Nothing to disclose; M. L. Schermerhorn: Nothing to disclose; F. S. Siami: Nothing to disclose

Table 1: Multivariate logistic models for 30-day MACE

CEA - Risk Factors	Odds Ratio	95% CI	p-value
Symptomatic	1.831	1.426 - 2.351	<0.0001
Age ≥80y	1.370	1.024 - 1.833	0.0341
CHF Class III/IV	1.707	1.027 - 2.839	0.0392
LVEF <30%	3.529	1.620 - 7.690	0.0015
Angina	3.920	1.545 - 9.942	0.0040
Contralateral Occlusion	3.164	2.112 - 4.738	<0.0001
High Anatomic Lesion	2.723	1.321 - 5.616	0.0067
CAS - Risk Factors	Odds Ratio	95% CI	p-value
Symptomatic	1.674	1.292 - 2.170	<0.0001
Recent MI	3.433	1.674 - 7.043	0.0008
Restenosis	0.591	0.430 - 0.813	0.0012
Prior Radiation to Neck	0.418	0.225 - 0.776	0.0057

PVSS18. Long-term clinical and anatomic outcomes following carotid endarterectomy

Jeanwan Kang, Virendra I. Patel, Shankha Mukhopadhyay, Ashu Garg, Matthew R. Cambria, Mark F. Conrad, Glenn M. LaMuraglia, Richard P. Cambria

Massachusetts General Hospital, Boston, MA.

OBJECTIVES: Carotid angioplasty and stenting (CAS) has been proposed as alternative to carotid endarterectomy (CEA), but late outcomes are unknown. Late outcomes after CEA have not been examined in a contemporary series and such is the aim of the current study.

METHODS: This was a retrospective study of patients who had undergone CEA at a single institution between 01/01/1989 and 12/01/2005. Primary study end points were stroke and death. Secondary study end points were recurrent stenosis and reintervention. Kaplan-Meier analysis was used to create survival curves for the study end points. Multivariate models were created to identify variables associated with the study end points.

RESULTS: A total of 3308 CEAs (mean age 71.1 ± 8.9 years; 60.4% male; 31.3% symptomatic; 3.5% redo surgery; 49.2% primary closure) were performed during the study period with mean follow up of 5.1 years [0-21.9 years]. Thirty-day stroke and death rates were 2.0% (1.2% ipsilateral) and 1.3% (inclusive of CEA/CABG), respectively. Median survival was 8.2 years with 5, 10, and 15-year survival of 70%, 42%, and 19%, respectively. Five, 10, and 15-year (any) stroke-free survival were 93%, 85%, and 72%, respectively. Cox proportional hazards analysis showed diabetes (HR=1.90; P<.0001), coronary artery disease (HR=1.75; P<.0001), chronic obstructive pulmonary disease (HR=1.60; P=.0002), current smoking status (HR=1.41; P=.0011), male gender (HR=1.20; P=.04), and age at CEA (HR=1.07; P<.0001) to be predictive of death. Symptomatic disease (HR=1.83; P<.0001), diabetes (HR=1.75; P=.0004), and female gender (HR=1.61; P=.0013) were predictive of late stroke. Restenosis(moderate or severe)-free survival at 5, 10, and 15 years were 77%, 64%, and 47%, respectively, whereas reintervention-free survival at 5, 10, and 15 years were 97%, 93%, and 89%, respectively.

CONCLUSIONS: CEA is associated with favorable long-term clinical and anatomic outcomes. These data may serve as a standard to compare late outcomes of CAS.

AUTHOR DISCLOSURES: **M. R. Cambria:** Nothing to disclose; **R. P. Cambria:** Nothing to disclose; **M. F. Conrad:** Nothing to disclose; **A. Garg:** Nothing to disclose; **J. Kang:** Nothing to disclose; **G. M. LaMuraglia:** Nothing to disclose; **S. Mukhopadhyay:** Nothing to disclose; **V. I. Patel:** Nothing to disclose

3:30 pm

PVSS19. Accuracy of administrative versus clinical data to evaluate carotid endarterectomy and carotid stenting

Rodney P. Bensley, Rob Hurks, Ruby C. Lo, Jeremy D. Darling, Elliot L. Chaikof, Allen D. Hamdan, Mark C. Wyers, Marc L. Schermerhorn

Surgery, Beth Israel Deaconess Medical Center, Boston, MA.

OBJECTIVES: Administrative data (AD) have been used to compare CEA and CAS. However, there are limitations in defining prior stroke/TIA and complications that may vary by procedure. Therefore, we did a direct comparison between administrative data and MD chart review for CEA and CAS.

METHODS: We performed an outcomes analysis on all CEA and CAS procedures from 2005-2010. We obtained ICD-9 codes from hospital records regarding prior stroke/TIA, symptom and high-risk status, and complications. An MD performed a chart review of the same patient records and the results were

compared.

RESULTS: We identified 983 patients: 876 CEA and 107 CAS. Prior stroke/TIA (>6 months old) was overestimated with AD (8.5% vs 5.9%) while the proportion of symptomatic patients was grossly underestimated (8.4% vs 31.6%). Physiologic high-risk status was also underestimated (5.0% vs 9.1%), but individual physiologic high-risk variables were overestimated. Anatomic high-risk status was unable to be determined with AD. The identification of perioperative strokes was identical at 2.1%, but with AD there were 6 false positive strokes and 6 false negative strokes identified giving an accuracy of 56%.

CONCLUSIONS: Administrative data are useful, but subject to coding accuracy. Administrative data are unreliable for determining preoperative symptom status and postoperative stroke complications when analyzing outcomes of CEA and CAS.

AUTHOR DISCLOSURES: **R. P. Bensley:** Nothing to disclose; **E. L. Chaikof:** Nothing to disclose; **J. D. Darling:** Nothing to disclose; **A. D. Hamdan:** Nothing to disclose; **R. Hurks:** Nothing to disclose; **R. C. Lo:** Nothing to disclose; **M. L. Schermerhorn:** Medtronic, Consulting fees or other remuneration (payment) Boston Scientific, Consulting fees or other remuneration (payment) Endologix, Consulting fees or other remuneration (payment); **M. C. Wyers:** Nothing to disclose

Comparison of outcomes analysis using administrative data versus MD chart review in patients who have undergone CEA or CAS

	Administrative data	MD chart review		Administrative data	MD chart review
Prior stroke/TIA	8.5%	5.9%	Physiologic high-risk	5.0%	9.1%
Symptomatic	8.4%	31.6%	Age > 80	19.3%	19.3%
Anatomic high-risk	0%	4.8%	MI within 30 days	12.6%	0.2%
Stroke complications *	2.1%	2.1%	Unstable angina	0.1%	1.0%
True positive strokes	15 (71.4%)	21	CHF class III/IV	9.3%	0.3%
False positive strokes	6 (28.6%)	0	Hemodialysis	8.9%	1.1%
False negative strokes	6 (28.6%)	0	Pulmonary dysfunction	16.7%	1.0%

* The accuracy of identification of postoperative strokes with administrative data is 56%

3:45 pm

PVSS20. Evaluating Effectiveness of Antibiotic Polymethylmethacrylate Beads in Treating Early and Late Vascular Graft Infections

Mun Jye Poi, MD, George Pisimisis, MD, Neal Barshes, MD MPH, Peter H Lin, MD, Panagiotis Kougias, MD, Carlos F Bechara, MD

Baylor College of Medicine; Houston, TX

OBJECTIVES: The objective is to evaluate effectiveness of antibiotic-based polymethylmethacrylate (ab-PMMA) beads in treating vascular graft infections.

METHODS: We reviewed 31 patients treated for 32 graft infections over the past 5 years using ab-PMMA beads in a single institution. All patients were started on broad spectrum antibiotics and later switched to targeted therapy based on intra-operative cultures for at least 6 weeks. All patients underwent multiple planned wound explorations, debridements and washouts. Cultures were obtained each time. Decision to do formal closure depended on culture results and wound appearance. All wounds were closed with a muscle flap. Our endpoints included limb salvage, recurrence of infection and graft preservation.

RESULTS: A total of 19 different organisms were isolated and 47% of cases were polymicrobial. The majority (n=23) received a mix of tobramycin/vancomycin PMMA beads, vancomycin beads (n=5), tobramycin beads (n=1) and gentamicin/vancomycin beads (3). Wound sterilization based on cultures was achieved in 28 cases (87.5%) with graft preservation. Four patients underwent early graft removal, three with immediate reconstruction. No death occurred within 30 days and one patient underwent a major amputation (3.1%). Limb salvage was achieved in 86.6% of the preserved graft group at a mean of 24.5 months (3-48 months). Four patients presented with graft occlusion and acute limb ischemia resulting in major amputation at 2.5, 7, 23 and 26 months. All 4 had evidence of recurrent graft infection (13.3%).

CONCLUSIONS: Sterilization of graft infection can be achieved with ab-PMMA beads followed by closure with muscle flap resulting in acceptable limb salvage rate.

AUTHOR DISCLOSURES: Mun Jye Poi, MD, George Pisimisis, MD, Neal Barshes, MD MPH, Peter H Lin, MD, Panagiotis Kougiaris, MD, Carlos F Bechara, MD

4:00 pm

PVSS21. Patient-Based Outcomes Following Wartime Extremity Vascular Injury: An Interim Analysis of the GWOT Vascular Injury Initiative (GWOT-VII)

Daniel J Scott, MD, Adam Stannard, MRCS, Zachary M Arthurs, MD, Diane L Lynd, RN, Howard M Monroe, PhD, April C Ames-Chase, RN, William D Clouse, MD, Todd E Rasmussen, MD
San Antonio Military Medical Center, Ft. Sam Houston, TX

OBJECTIVES: Modern studies on wartime vascular trauma have previously focused on management strategies and early results with no characterization of enduring functional limb salvage or its relation to quality of life. The objective of this study is to describe long-term, patient-based outcomes following extremity vascular injury.

METHODS: The Joint Theater Trauma Registry was queried for US troops with extremity vascular injury. Data from the time of injury was recorded and, in a prospective manner, the Short Form 36 (SF-36) was administered. Primary end-points were amputation-free survival and quality of life measures.

RESULTS: One hundred eighty-nine (age 27.1±6.6 years) patients completed surveys. Injury Severity and Mangled Extremity Severity Scores were 15.24±8.7 and 5.65±1.4, respectively. Amputation-free survival was 86% at 61±22 months. SF-36 Physical and Mental Component Scores in the overall cohort were 43.3±9.3 and 46.6±12.4, respectively. Compared to limb salvage, secondary amputation had no effect on mental component outcomes but did result in lower Physical Functioning (37.4±11, p<0.05) and Physical Component Summary scores (40.5±9, p=0.09). Additionally, age greater than 40 years or the presence of chronic pain or depression were associated with poor physical and mental component outcomes (p<0.05). Conversely, favorable employment status and a higher educational background were associated with improved outcomes (p<0.05).

CONCLUSIONS: This study characterizes long-term, patient-based outcomes following wartime extremity vascular injury. Despite a laudable amputation rate, a lasting burden of limb salvage is present

which limits quality of life years after injury. Additional study is needed to identify management and recovery strategies that will improve post-injury quality of life.

AUTHOR DISCLOSURES: Daniel J Scott, MD, Adam Stannard, MRCS, Zachary M Arthurs, MD, Diane L Lynd, RN, Howard M Monroe, PhD, April C Ames-Chase, RN, William D Clouse, MD, Todd E Rasmussen, MD

4:15 pm

PVSS22. Racial Disparities and Site of Care in Readmissions after Major Vascular Surgery

Micah Girotti¹, Jonathan L. Eliason², Justin B. Dimick¹, Peter K. Henke²

¹University of Michigan, Department of Surgery, Center for Healthcare Outcomes and Policy, Ann Arbor, MI; ²University of Michigan, Department of Surgery, Section of Vascular Surgery, Ann Arbor, MI.

OBJECTIVES: Black patients are disadvantaged in many aspects of vascular surgical care compared to non-blacks, such as post-operative mortality and receipt of endovascular procedures. We sought to examine whether these racial disparities extend to rates of post-operative readmission.

METHODS: National Medicare beneficiaries undergoing major vascular surgery (open abdominal aortic aneurysm repair (AAAR) and lower extremity bypass (LEB)) in 2000-2008 were examined (n=387,501). Risk-adjusted 30-day readmission was the primary outcome measure. Logistic regression was used to adjust for patient factors. After ranking hospitals by proportion of black patients served, differences in readmission rates were examined. Finally, the impact of the site of care on the observed disparity was assessed by using modeling techniques that adjust for hospital-specific readmission differences.

RESULTS: After adjusting for patient factors, blacks were 20% more likely than non-blacks to be readmitted. Black patients receiving care in predominantly minority-serving hospitals were readmitted more often than black patients in non-minority-serving hospitals (19.9% vs. 14.2%, p<.001). In models accounting for differences in site of care, the hospitals where black patients receive care accounted for approximately 55% of the residual disparity in readmission rates. This magnitude of this effect was similar for both operations (34% in AAAR, 56% in LEB).

CONCLUSIONS: Black patients are more likely to be readmitted to the hospital following major vascular surgery compared to non-black patients. Higher readmission rates in minority-serving hospitals play an important role in this observed disparity. Whether patient-level factors or hospital-level processes contribute will require further study.

AUTHOR DISCLOSURES: **J. B. Dimick:** Nothing to disclose; **J. L. Eliason:** Nothing to disclose; **M. Girotti:** Nothing to disclose; **P. K. Henke:** Nothing to disclose

4:30 pm

PVSS23. Simulation-based training to teach open AAA repair to surgical residents requires dedicated faculty instruction

William P. Robinson¹, Donald T. Baril¹, Odette Taha¹, Andres Schanzer¹, Anne C. Larkin¹, Jean Bismuth³, Erica L. Mitchell², Louis M. Messina¹

¹University of Massachusetts Medical School, UMass Memorial Medical Center, Worcester, MA;

²Oregon Health & Science University, Portland, OR; ³Methodist DeBakey Heart and Vascular Center, The Methodist Hospital, Houston, TX.

OBJECTIVES: We assessed the impact of AAA-specific simulation training on resident performance in simulated open abdominal aortic aneurysm repair (SOAAAR) and determined whether simulation training required dedicated faculty instruction.

METHODS: We randomized 18 residents (PGY3-5) to an AAA simulation course consisting of either two mandatory practice sessions proctored by a surgical skills lab coordinator (Group A, n=8) or two sessions led by a vascular faculty instructor (Group B, n=10). All residents received a detailed manual and video demonstrating the technique of open AAA repair. Blinded faculty graded SOAAAR performance at baseline and post-course using a validated tool.

RESULTS: Characteristics and baseline scores between Groups A and B were not different. Post-course, there was a trend towards improved performance in Group A as measured by procedural checklist scores (34.8 ± 9.5 vs. 31 ± 12.6 , $P=.08$). Group B performance was improved from baseline with regard to procedural checklist scores (44.1 ± 6.3 vs. $34.9 \pm .5$, $P=.02$), global rating scores ($28.4 \pm .6$ vs. 25.3 ± 5.0 , $P=.049$), and overall assessment of operative competence ($P=.02$), with a trend toward significance in quality of final product ($P=.1$). Time to complete SOAAAR improved in both groups ($P=.02$). Baseline performance varied significantly with year of training (PGY3: 42 ± 15 - PGY5: 67 ± 15 , $P=.008$). Improvement varied inversely with year of training ($P<.05$) and post-course scores were equivalent for PGY3-5 residents.

CONCLUSIONS: An AAA-specific simulation training course improved resident performance in simulated open AAA repair. Dedicated faculty instruction during the simulation training was required for significant improvement in resident performance. The impact of simulation training was greatest in more junior residents. Procedure-specific simulation training with dedicated faculty can be used to effectively teach operative procedures and should focus on early residency training.

AUTHOR DISCLOSURES: **D. T. Baril:** Nothing to disclose; **J. Bismuth:** Nothing to disclose; **A. C. Larkin:** Nothing to disclose; **L. M. Messina:** Nothing to disclose; **E. L. Mitchell:** Nothing to disclose; **W. P. Robinson:** Nothing to disclose; **A. Schanzer:** Nothing to disclose; **O. Taha:** Nothing to disclose

4:45 pm

PVSS24. Surgical intervention for radial artery catheter-associated ischemic complications

Phong T. Dargon, Timothy K. Liem, Margaret C. Gorman, Amir F. Azarbal, Erica L. Mitchell, Gregory J. Landry, Gregory L. Moneta

Oregon Health & Science University, Portland, OR.

OBJECTIVES: Radial artery catheterization may be complicated by arterial thrombosis and hand ischemia. We sought to identify risk factors for radial catheter-associated ischemic hand complications and need for operative intervention.

METHODS: All patients with radial artery catheter-associated ischemic hand complications at a single hospital between 2006 and 2011 were identified. Clinical risk factors (vascular comorbidities, anticoagulation or antiplatelet therapy, shock, sepsis, and APACHE score) in patients whose complications lead to surgical consultation, were compared with an age- and gender-matched control patient cohort with uncomplicated radial artery catheters. Nominal variables were compared using McNemar test, chi-square, and fisher's exact test ($P<.05$). Paired t-test and one-way ANOVA were used for continuous variables.

RESULTS: There were 23 consultations performed for hand ischemia related to radial artery catheters.

Compared to nonischemic controls consulted patients were more likely to have shock ($P=.002$), sepsis ($P=.01$), and be receiving anticoagulation ($P=.04$). Twelve patients (52%) required surgical revascularization; thrombectomy (91.7%), intraoperative thrombolysis (58.3%), vein patch angioplasty (33.3%), and intraoperative angiography (50%). In patients who underwent revascularization, 2 required digital amputation, 1 required major upper extremity amputation, and 2 patients died. In patients who underwent nonoperative management, none required amputation. Overall mortality was 22% in patients requiring vascular consultation and 17% in those requiring operation for radial artery catheter ischemic complications.

CONCLUSIONS: Fifty-two percent of patients with ischemic complications of radial artery catheters require operation and mortality is high. Patients with shock and sepsis are more likely to develop radial catheter-associated upper extremity ischemia. Those requiring revascularization have a high rate of digital or major upper extremity amputation.

AUTHOR DISCLOSURES: **A. F. Azarbal:** Nothing to disclose; **P. T. Dargon:** Nothing to disclose; **M. C. Gorman:** Nothing to disclose; **G. J. Landry:** Nothing to disclose; **T. K. Liem:** Nothing to disclose; **E. L. Mitchell:** Nothing to disclose; **G. L. Moneta:** Nothing to disclose