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Vascular & Endovascular Surgery Society

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W. Darrin Clouse, MD

SVS Young Surgeons Advisory

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Past Meetings & Presidents

Date	Location	President
1976	Chicago, IL	Organizational Meeting
1977	Dallas, TX	Steven M. Dosick, MD
1978	San Francisco, CA	Robert G. Scribner, MD
1979	Chicago, IL	William S. Gross, MD
1980	Chicago, IL	Charles A. Andersen, MD
1981	Dallas, TX	Larry H. Hollier, MD
1982	Boston, MA	G. Edward Bone, MD
1983	San Francisco, CA	Robert C. Batsou, MD
1984	Atlanta, GA	Lee C. Bloemendal, MD
1985	Baltimore, MD	George J. Collins, Jr.
1986	New Orleans, LA	Jonathan B. Towne, MD
1987	Toronto, Canada	Thomas S. Riles, MD
1988	Chicago, IL	Paul T. McDonald, MD
1989	New York, NY	Anthony J. Comerota, MD
1990	Los Angeles, CA	John W. Hallett, Jr., MD
1991	Boston, MA	Paul M. Orecchia, MD
1992	Chicago, IL	David L. Rollins, MD
1993	Washington, DC	Frank T. Padberg, Jr., MD
1994	Seattle, WA	Peter G. Kalman, MD
1995	New Orleans, LA	William J. Quinones-Baldrich, MD
1996	Chicago, IL	Joseph L. Mills, MD
1997	Boston, MA	Gary Giangola, MD
1998	San Diego, CA	J. Gordon Wright, MD
1999	Washington, DC	Jeffrey R. Rubin, MD
2000	Toronto, Canada	Donald L. Akers, Jr., MD
2001	Baltimore, MD	Thomas F. Lindsay, MD
2002	Boston, MA	R. Clement Darling, III, MD
2003	Chicago, IL	Jeffrey L. Ballard, MD
2004	Anaheim, CA	Samuel R. Money, MD
2005	Chicago, IL	Lewis B. Schwartz, MD
2006	Philadelphia, PA	Robert A. Cambria, MD
2007	Baltimore, MD	William D. Jordan, Jr., MD
2008	San Diego, CA	W. Charles Sternbergh, III, MD
2009	Denver, CO	Tina R. Desai, MD
2010	Boston, MA	Karl A. Illig, MD
2011	Chicago, IL	Marc A. Passman, MD
2012	Baltimore, MD	Martin R. Back, MD
2013	Park City, UT	Ruth L. Bush, MD, MPH
2014	Steamboat Springs, CO	W. Darrin Clouse, MD
2015	Vail, CO	Vikram S. Kashyap, MD
2016	Park City, UT	Sean P. Roddy, MD
2017	Steamboat Springs, CO	Thomas S. Maldonado, MD
2018	Vail, CO	Peter R. Nelson, MD

Award History

Year	Award	Recipient
2011	<ul style="list-style-type: none">• Academic Award—Faculty• Academic Award—Fellow• Travel Award	Guillermo A. Escobar, Ann Arbor, MI Bjoern Suckow, MD, Salt Lake City, UT Judith C. Lin, MD, Detroit, MI
2012	<ul style="list-style-type: none">• Academic Award—Faculty• Academic Award—Fellow• Travel Award• Norman M. Rich Military Award	John Curci, MD, St. Louis, MO Kathleen Lamb, MD, Philadelphia, PA Karen Woo, MD, Los Angeles, CA Cpt. Carole Villamaria, MD, Ft. Sam Houston, TX
2013	<ul style="list-style-type: none">• Norman M. Rich Military Award	Cpt. Marlin Wayne Causey, MD, Tacoma, WA
2014	<ul style="list-style-type: none">• Norman M. Rich Military Award• Young Faculty Research Award	Cpt. Daniel Scott, MD, San Antonio, TX Dawn M. Coleman, MD, Ann Arbor, MI
2015	<ul style="list-style-type: none">• Early Career Faculty Research Award• W. L. Gore Travel Award	Ryan McEnaney, MD, Pittsburgh, PA Matthew Mell, MD, Stanford, CA
2016	<ul style="list-style-type: none">• Best Paper Award• W. L. Gore Travel Award	Diego Ayo, MD, New York, NY Justin Hurie, MD, Winston-Salem, NC
2017	<ul style="list-style-type: none">• Early Career Faculty Award• Medtronic Resident Research Award• W. L. Gore Travel Award	Jean Marie Ruddy, MD, Charleston, SC Gayan de Silva, MD, St. Louis, MO Ying Wei Lum, MD, Baltimore, MD
2018	<ul style="list-style-type: none">• Early Career Faculty Award• Medtronic Resident Research Award• W. L. Gore Travel Award	Jeffrey Siracuse, MD, Boston, MA Frank Davis, MD, Ann Arbor, MI Nicolas Mouawad, MD, Bay City, MI

General Information

Registration

For security reasons, the scientific session hall and exhibit hall will be monitored for conference badges and/or hotel staff badges. Please wear your conference badge to all events. The VESS registration desk will be located in the **Ballroom Foyer** at the Cliff Lodge. Registration hours are as follows:

Thursday, January 31	7:00 am – 5:00 pm
Friday, February 1	6:00 am – 9:30 am
	3:00 pm – 6:30 pm
Saturday, February 2	6:00 am – 9:30 am
	3:00 pm – 6:00 pm
Sunday, February 3	6:30 am – 9:30 am

Scientific Sessions

All scientific sessions will be conducted in **Ballroom 2 & 3** at the Cliff Lodge unless otherwise noted.

Speaker Ready Room

Speakers are required to check-in to the Speaker Ready Room to upload their PowerPoint presentations (using USB flash drive) at least 2-hours prior to their scheduled talk. **No personal laptops will be permitted at the podium.** The hours of operation of the Speaker Ready Area are listed below:

Thursday, January 31	7:00 am – 1:00 pm
Friday, February 1	6:30 am – 9:30 am
	3:30 pm – 7:00 pm
Saturday, February 2	6:30 am – 9:30 am
	3:30 pm – 6:00 pm
Sunday, February 3	6:30 am – 9:30 am

Technology Forum

The 2019 Tech Exchange will focus on broad vascular pathology and will showcase some of the best that industry has to offer. In addition to highlighting aortic endografts, peripheral and embolization technology and the latest in venous care, we will also be showcasing current and advanced capabilities in medical imaging. The emphasis of this program is for industry to provide insight into current and up-and-coming technology, as well as what treating physicians may see in the near future as it relates to developments in the pipeline. It will also provide opportunity for an intensive, hands-on experience in a small group format that provides a granular experience for the participating physicians.

The Technology Forum will be held on **Thursday, January 31, 2019** from **2:30 pm – 5:30 pm** in **Ballroom 2** at the Cliff Lodge. If you did not pre-register for this event, please check-in at the registration desk located in the Ballroom Foyer.

Please Note: This program is not eligible for CME credits.

Round Table Discussions

Friday, February 1, 2019

10:00 am – 12:00 pm

Location: Wasatach Room

Career Options for Young Surgeons (Pros and Cons of Academic vs. Private)

Moderator: Faisal Aziz, MD

Objectives:

- To understand the career path in the field of vascular surgery
- Understanding pros and cons of joining an academic or private practice
- How to Succeed in academic or private practice careers

Saturday, February 2, 2019

10:00 am – 12:00 pm

Location: Wasatach Room

Building Your Brand as a Young Surgeon

Moderator: James Black, MD

Objectives:

- Explore career development for young surgeons
- Acquisition of new skill sets as a young surgeon
- Understand reporting standards that can influence practice development

Continuing Medical Education Credit Information

Accreditation Statement

In support of improving patient care, this activity has been planned and implemented by Amedco, LLC and Vascular and Endovascular Surgery Society. Amedco LLC is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE) and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

Credit Designation Statement

Amedco designates this live activity for a maximum of 14.50 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Satisfactory Completion

Learners must complete an evaluation form to receive a certificate of completion. Your chosen sessions must be attended in their entirety. Partial credit of individual sessions is not available. If you are seeking continuing education credit for a specialty not listed below, it is your responsibility to contact your licensing/certification board to determine course eligibility for your licensing/certification requirement.

Learning Objectives

This activity is designed for vascular surgeons. Upon completion of this course, attendees should be able to:

- Evaluate the use of tibial interventions within their own practice
- Review their practice patterns regarding the administration of opioid medications
- Better stratify patients for risk of deep vein thrombosis after ablation of superficial veins
- Better evaluate patients regarding use of measures of frailty
- Understand risk factors for high radiation exposure
- Better treat patients who have sustained vascular injuries from trauma
- Evaluate the use of ultrasound for arterial access within their own institution

Acknowledgements

Educational Grants

The Vascular and Endovascular Surgery Society wishes to recognize and thank the following companies for their ongoing support through educational grants:

Boston Scientific
Cook Medical
Medtronic
W. L. Gore

Marketing Support

The Vascular and Endovascular Surgery Society wishes to recognize and thank the following companies for their ongoing support through marketing:

Abbott Vascular
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2019 Exhibitors

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Tactile Medical
Terumo Aortic
W.L. Gore & Associates
Zero Gravity



Notes

Schedule-At-A-Glance

Thursday, January 31, 2019

7:00 am – 5:00 pm	Registration
8:15 am – 12:15 pm	VESS VASCULAR FELLOWS' COURSE
8:15 am – 12:15 pm	VESS STUDENT MENTOR PROGRAM
10:30 am – 11:00 am	Coffee Break
12:30 pm – 1:30 pm	Fellows /Students Lunch
2:30 pm – 5:30 pm	VESS VASCULAR TECHNOLOGY FORUM (Didactic & Hands-On)
5:30 pm – 7:00 pm	WELCOME RECEPTION All attendees, guests & exhibitors are welcome.

Friday, February 1, 2019

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
7:00 am – 9:15 am	SCIENTIFIC SESSION I Moderators: Jonathan Eliason, MD & Justin Hurie, MD
7:00 am – 7:12 am	1 The Rates of Endovascular Tibial Intervention are Increasing without Affecting the Rates of Major Amputations Peng Zhao, Javier Bautista, Joseph J. Guido, Elaine L. Hill, Gary R. Morrow, Adam J. Doyle, Jennifer L. Ellis, Kathleen G. Raman, Michael C. Stoner, Roan J. Glocker - University of Rochester, Rochester, NY
7:12 am – 7:24 am	2 Endovascular Aneurysm Repair Cost Varies by Complication Type and Center but Not by Endograft Manufacturer Zachary J. Wanken ¹ , Spencer W. Trooboff ¹ , Barbara Gladders ² , Art Sedrakyan ³ , Jesse A. Columbo ¹ , Bjoern D. Suckow ¹ , David H. Stone ¹ , Philip P. Goodney ¹ - ¹ Dartmouth-Hitchcock Medical Center, Lebanon, NH; ² The Dartmouth Institute, Lebanon, NH; ³ Weill-Cornell Medical School, New York City, NY
7:24 am – 7:36 am	3 Are Volume Standards for Open AAA Repair Realistic? Margaret E. Smith, Danielle C. Sutzko, Jonathan L. Eliason, Peter K. Henke, Nicholas H. Osborne - University of Michigan, Ann Arbor, MI

Schedule-At-A-Glance

7:36 am – 7:48 am	4 Incidence and Risk Factors for Deep Vein Thrombosis after Ablation of Superficial Lower Extremity Veins Nathan K. Itoga, Celine Deslarzes-Dubuis, Kara A. Rothenberg, Elizabeth George, Venita Chandra, E. John Harris - Stanford University, Stanford, CA
7:48 am – 7:56 am	5 (RF) Vascular Complications Following Percutaneous Femoral Arterial Access at a Multi-Disciplinary Institution Danielle R. Lyon, Timothy M. Sullivan, Andrew H. Cragg, Peter B. Alden, Jesse M. Manunga, Elliot J. Stephenson, Jessica M. Titus, Joseph Karam, Xiaoyi Teng, Jason Q. Alexander - Minneapolis Heart Institute Foundation, Minneapolis, MN
7:56 am – 8:04 am	6 (RF) The Impact of Achieving a Normal ABI on Patency and Limb Salvage after Peripheral Vascular Intervention Zdenek Novak, Johnston L. Moore, John C. Axley, Emily L. Spangler, Benjamin J. Pearce, Graeme E. McFarland, Mark A. Patterson, Marc A. Passman, Adam W. Beck - University of Alabama at Birmingham School of Medicine, Birmingham, AL
8:04 am – 8:12 am	7 (RF) Underutilization of Non-Opioid Pain Medication in Patients Undergoing AAA Repair John Phair ¹ , Dov Levine ² , Larry Scher ¹ , Karan Garg ¹ - ¹ Montefiore Medical Center, Bronx, NY; ² Albert Einstein College of Medicine, Bronx, NY
8:12 am – 8:24 am	8 Endovascular Creation of an Arteriovenous Fistula with a Next Generation 4 Fr Device Design for Hemodialysis Access: Clinical Experience from the EASE Study Todd Berland, Greg Westin, Jason Clement, Joe Griffin, Mike Sadek, Sheila Blumberg, Mike Barfield, Tom Maldonado - New York University, New York, NY
8:24 am – 8:35 am	9 Management of Concomitant Vein Injury in the Setting of Military Popliteal Artery Trauma: Limb Outcomes Assessment Jordan L. Guice, Shaun M. Gifford, Kai W. Hata, Xiaoming Shi, Brandon W. Propper, David S. Kauvar - San Antonio Military Medical Center, Fort Sam Houston, TX

Schedule-At-A-Glance

8:35 am – 8:47 am	10 System-Wide Analysis of Radiation use among Surgical Specialties: Identifying Where Vascular Surgeons Can Improve Sharon C. Kiang ¹ , Austin S. Huh ² , Jessica R. Davis ² , Hans K. Boggs ² , Jon W. Floresca ² , Donald V. Farley ² , Ahmed M. Abou-Zamzam, Jr. ² , Roger T. Tomihama ² - ¹ Veterans Affairs Loma Linda Healthcare System, Loma Linda, CA; ² Loma Linda University Medical Center, Loma Linda, CA
8:47 am – 8:55 am	11 (RF) Contemporary Upper Extremity Vascular Injury in Combat Matthew Vuoncino, Andrew J. Soo Hoo, Paul W. White, Todd E. Rasmussen, Joseph M. White - Walter Reed National Military Medical Center, Bethesda, MD
8:55 am – 9:03 am	12 (RF) A Systematic Review and Meta-Analysis Comparing Abdominal Aortic Aneurysm Repair Outcomes Between Obese and Non-Obese Patients Ian Wee ¹ , Hao Yun Yap ² , Edward Choke ² , Tze Tec Chong ² - ¹ Yong Loo Lin School of Medicine, National University of Singapore, Singapore; ² Singapore General Hospital, Singapore
10:00 am – 12:00 pm	ROUND TABLE DISCUSSIONS (Optional Programming) Career Options for Young Surgeons (Pros and Cons of Academic vs. Private Practice) <i>See page 9 for more information</i>
3:00 pm	Registration Re-Opens
3:30 pm – 4:00 pm	Coffee Break
4:00 pm – 6:00 pm	SCIENTIFIC SESSION II Moderators: Faisal Aziz, MD & Andrew Metzler, MD
4:00 pm – 4:12 pm	13 Lowering the Ankle Brachial Index Threshold in Blunt Lower Extremity Trauma May Prevent Unnecessary Imaging Jake F. Hemingway, Enock A. Adjei, Sarasijhaa K. Desikan, Joel A. Gross, Nam T. Tran, Niten Singh, Elina Quiroga - University of Washington, Seattle, WA
4:12 pm – 4:24 pm	14 Expedited Arteriovenous Graft Creation for the Super-Elderly Does Not Significantly Decrease Hemodialysis Catheter Time or Short-Term Morbidity Miles Jackson, Luke Pesonen, Abdulhameed Aziz, Chinmaya Shelgikar, Ahmed Rehan - St. Joseph Mercy, Ann Arbor, Ypsilanti, MI

Schedule-At-A-Glance

4:24 pm – 4:36 pm	15 Impact of Staged Vascular Management on Limb Outcomes in Wartime Femoropopliteal Arterial Injury David S. Kauvar ¹ , Brandon W. Propper ¹ , Zachary M. Arthurs ¹ , Thomas J. Walters ² - ¹ San Antonio Military Medical Center, Fort Sam Houston, TX; ² United States Army Institute of Surgical Research, Fort Sam Houston, TX
4:36 pm – 4:48 pm	16 Discharge to a Facility is Not Protective Against Wound Events Following Emergent Femoral Artery Repair Joseph M. Anderson, Thomas Brothers, Jacob Robison, Mathew Wooster, Ravikumar Veeraswamy, Rupak Mukherjee, Jean M. Ruddy - Medical University of South Carolina, Charleston, SC
4:48 pm – 4:56 pm	17 (RF) Penetrating Abdominal Aortic Injury: Comparison of Level I and II Trauma Centers Brian M. Sheehan, Areg Grigorian, Shelley Maitzel, Boris Borazjani, Nii-Kabu Kabutey, Roy Fujitani, Michael Lekawa, Jeffrey Nahmias - University of California, Irvine Medical Center, Orange, CA
4:56 pm – 5:04 pm	18 (RF) Use of Thrombolysis in Acute Lower Extremity Ischemia with Known Distal Target Vessel for Revascularization Nicholas J Gargiulo, III - The Brookdale University Hospital & Medical Center, Mineola, NY
5:04 pm – 5:12 pm	19 (RF) Anatomic Variation of the Phrenic Nerve and Brachial Plexus Encountered During 100 Supraclavicular Decompressions for Neurogenic Thoracic Outlet Syndrome with Associated Post-Operative Neurologic Complications Scott R. Golarz ¹ , Joseph M. White ² - ¹ Temple University Hospital, Philadelphia, PA; ² Walter Reed National Military Medical Center, Bethesda, MD
5:12 pm – 5:24 pm	20 Optimal Timing of Carotid Endarterectomy in Symptomatic Patients James Andersen, Kristyn Mannoia, Sheela Patel, Sharon Kiang, Christian Bianchi, Theodore H. Teruya, Ahmed Abou-Zamzam, Jr. - Loma Linda University Medical Center, Loma Linda, CA

Schedule-At-A-Glance

5:24 pm – 5:36 pm	21 Analysis of Genetic Polymorphism of HLA-DRB1 Alleles in Mexican Patients with Abdominal Aortic Aneurysms and Possible Associations with Susceptibility or Protection Javier E. Anaya-Ayala ¹ , Manuel Garcia-Toca ² , Susana Hernandez-Dono ¹ , Monica Escamilla-Tilch ³ , Jose Marquez-Garcia ⁴ , Kemberly Hernandez-Sotelo ¹ , Julio Granados ¹ , Carlos A. Hinojosa ¹ - ¹ Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico; ² Stanford University, Palo Alto,CA; ³ Centro Medico Nacional 20 de Noviembre, ISSSTE, Mexico; ⁴ Instituto Nacional de Enfermedades Respiratorias Ismael Cosío Villegas, Mexico
5:36 pm – 5:48 pm	22 Performance of Drug Technology in Patients with Critical Limb Ischemia Treated with Paclitaxel-Eluting Stents and Paclitaxel-Coated Balloons Matthew Carnevale ¹ , John Phair ² , Karan Garg ² - ¹ Albert Einstein College of Medicine, Bronx, NY; ² Montefiore Medical Center, Bronx, NY
5:48 pm – 6:00 pm	23 Long-Term Proximal Aortic Remodeling Following Thoracic Endovascular Aortic Repair for Blunt Thoracic Aortic Injury Emily H. Bero, Calvin T. Nguyen-Ho, Brian D. Lewis, William D. Foley, Cheong J. Lee - Medical College of Wisconsin, Milwaukee, WI
6:00 pm	VESS MEMBER BUSINESS MTG.
6:15 pm – 7:15 pm	INDUSTRY SPONSORED SYMPOSIUM <i>Sponsored by: Janssen Pharmaceuticals</i> XARELTO®: Compass Trial Results for Patients with Chronic CAD/PAD Brian Ferris, MD Vascular Surgeon/Clinical Investigator Medical Director, Lake Washington Vascular Laboratory (ICAVL Certified) Chief of Surgery, Overlake Hospital Medical Center
7:00 pm	Free Evening

Saturday, February 2, 2019

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
6:55 am – 7:00 am	NEWS AND VIEWS FROM THE SVS Kim Hodgeson, MD President-Elect, SVS

Schedule-At-A-Glance

7:00 am – 8:15 am	<p>SCIENTIFIC SESSION III Moderators: Cheong Lee, MD & Ravi Rajani, MD</p>
7:00 am – 7:12 am	<p>24 Disparity in Outcomes after Revascularization for Critical Limb Ischemia Warrants Separate Reporting of Tissue Loss and Rest Pain Anand Brahmandam¹, Navid Gholitabar¹, Jonathan Cardella¹, Naiem Nassiri¹, Alan Dardik¹, Marc Georgi², Cassius Iyad Ochoa Chaa¹ - ¹Yale University School of Medicine, New Haven, CT; ²Catalyst Medical Consulting, Simpsonville, SC</p>
7:12 am – 7:24 am	<p>25 Operative Complexity and Prior Endovascular Intervention Negatively Impact Morbidity after Aortobifemoral Bypass in the Modern Era Charles Decarlo, Laura Boitano, Emel Ergul, Samuel I. Schwartz, Robert T. Lancaster, Mark F. Conrad, Matthew J. Eagleton, W. Darrin Clouse - Massachusetts General Hospital, Boston, MA</p>
7:24 am – 7:36 am	<p>26 Obesity Should not Prevent Radiofrequency Ablation in C2 and C3 Venous Disease Patients Peng Zhao, Mark D Balceniuk, Isabelle Chu, Luke Cybulski, Adam J. Doyle - University of Rochester Medical Center, Rochester, NY</p>
7:36 am – 7:48 am	<p>27 Clinical Practice Patterns and Bias in Randomized Trials: A Survey of Investigators in the BEST-CLI Trial Alik Farber¹, Matthew Menard², Susan Assmann³, Mazen S. Albaghdadi⁴, Michael N. Young⁴, Maria F. Villarreal¹, Sandra Siami³, George Sopko⁵, Diane Reid⁵, Michael Strong², Kenneth Rosenfield⁴ - ¹Boston Medical Center, Boston, MA; ²Brigham and Women's Hospital, Boston, MA; ³New England Research Institutes, Inc. (NERI), Watertown, MA; ⁴Massachusetts General Hospital, Boston, MA; ⁵National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health (NIH), Bethesda, MD</p>
7:48 am – 7:56 am	<p>28 (RF) Long-Term Quality of Life Comparison Between Supra and Infraclavicular Rib Resection in Patients with vTOS Anahita Dua, Kara Rothenberg, Jason T. Lee - Stanford University, Menlo Park, CA</p>
7:56 am – 8:04 am	<p>29 (RF) Temporal Trends and Hospital Charges Associated with an Endovascular Approach for Acute Limb Ischemia Courtenay M. Holscher, Joseph K. Canner, Jacqueline M. Garonzik Wang, Christopher J. Abularrage, James H. Black, III, Caitlin W. Hicks - Johns Hopkins University, Baltimore, MD</p>

Schedule-At-A-Glance

8:04 am – 8:12 am	30 (RF) Influence of Suprarenal Fixation on Perioperative Renal Outcomes after EVAR: Keep the Function you Still Have Jaime Benarroch-Gampel, Christopher R. Ramos, Amit Pujari, Yazan Duwayri, Ravi R. Rajani, William D. Jordan, Jr., Robert S. Crawford - Emory University, Atlanta, GA
8:15 am – 8:45 am	AWARD SESSION Moderators: Jonathan Eliason, MD & Karen Woo, MD Update from 2018 Winner(s) <ul style="list-style-type: none"> • Travel Award • Resident Research Award • Early Career Faculty Award 2019 Award Winners <ul style="list-style-type: none"> • Medtronic Vascular Resident Research Award • VESS Early Career Faculty Research Award
8:50 am – 9:00 am	Introduction of the President James Black, MD
9:00 am – 9:45 am	PRESIDENTIAL ADDRESS Jonathan Eliason, MD
10:00 am - 12:00 pm	ROUND TABLE DISCUSSIONS (Optional Programming) Building Your Brand as a Young Surgeon <i>See page 9 for more information</i>
3:00 pm	Registration Re-Opens
3:30 pm – 4:00 pm	Coffee Break
4:00 pm – 6:00 pm	SCIENTIFIC SESSION IV Moderators: Mark Conrad, MD & Matthew Corriere, MD
4:00 pm – 4:12 pm	31 Contemporary Outcomes of Peripheral Bypass Compared to Amputation in Octogenarians Cheryl Richie, Daniel Davenport, Nathan T. Orr - University of Kentucky, Lexington, KY
4:12 pm – 4:24 pm	32 Renal Artery Coverage During EVAR for Ruptured AAA Adam Tanius ¹ , Laura T. Boitano ¹ , Linda J. Wang ¹ , Murray L. Shames ² , Jason T. Lee ³ , Mathew J. Eagleton ¹ , W. Darrin Clouse ¹ , Mark F. Conrad ¹ - ¹ Massachusetts General Hospital, Boston, MA; ² University of South Florida, Tampa, FL; ³ Stanford University, Stanford, CA
4:24 pm – 4:36 pm	33 The Reintervention Index a New Measure for Comparative Effectiveness of Lower Extremity Revascularization Cassius Iyad Ochoa Chaar, Navid Gholitabar, Mara DeTrani, Saman Doroodgar, Haoran Zhuo, Yawei Zhang, Alan Dardik - Yale University, New Haven, CT

Schedule-At-A-Glance

4:36 pm – 4:48 pm	34 Timing of Minor Amputation Following Lower Extremity Revascularization Impacts Healing Outcomes Tia Sutton ¹ , Sanya Lulla ² , Sean Nassoioy ² , Carlos Bechara ² , Paul Crisostomo ² , Pegge Halandras ² , Michael Soult ² , Bernadette Aulivola ² - ¹ Loyola University Chicago Stritch School of Medicine, Maywood, IL; ² Loyola University Medical Center, Maywood, IL
4:48 pm – 4:56 pm	35 (RF) Lower Socioeconomic Status is Associated with Groin Wound Complications Following Revascularization for Peripheral Artery Disease Saagar C. Bakshi, Amanda Fobare, Jaime Benarroch-Gampel, Victoria Teodorescu, Ravi R. Rajani - Emory University, Atlanta, GA
4:56 pm – 5:04 pm	36 (RF) Utilization and Outcomes of Radial Artery Access for Lower Extremity Endovascular Intervention Abhisekh Mohapatra, Zein M. Saadeddin, Efthymios D. Avgerinos, Georges E. Al-Khoury, Eric S. Hager, Mohammad H. Eslami - University of Pittsburgh Medical Center, Pittsburgh, PA
5:04 pm – 5:12 pm	37 (RF) Bilateral Iliac Vein Stenting Reduces Great and Small Saphenous Venous Reflux Jesse Chait, Pavel Kibrik, Kevin Kenney, Ahmad Alsheekh, Yuriy Ostrozhynskyy, Anil Hingorani, Enrico Ascher, Sareh Rajaei - Vascular Institute of New York, Brooklyn, NY
5:12 pm – 5:24 pm	38 Opioid Consumption Following Carotid Revascularization Mark D. Balceniuk, Peng Zhao, Isabelle V. Chu, Brian C. Ayers, Tianna M. Negron, Kathleen Raman, Jennifer L. Ellis, Adam J. Doyle, Roan J. Glocker, Michael C. Stoner - University of Rochester Medical Center, Rochester, NY
5:24 pm – 5:36 pm	39 Prolonged Door to Intervention Time is Not Associated with Inferior Outcomes for Ruptured AAAs Frank M. Davis, Danielle C. Sutzko, Margaret E. Smith, Katherine Gallagher, Peter K. Henke, Nicholas H. Osborne - University of Michigan, Ann Arbor, MI
5:36 pm – 5:48 pm	40 Comparison of Perioperative Outcomes Following Iliac Branch Endoprostheses (IBE) Compared to Hypogastric Occlusion or Open Surgery for Elective Treatment of Aortoiliac Aneurysms in the NSQIP Database Mario D'Oria, Bernardo Mendes, Katherine Bews, Jill Johnstone, Fahad Shuja, Manju Kalra, Thomas Bower, Gustavo Oderich, Randall DeMartino - Mayo Clinic, Rochester, MN

Schedule-At-A-Glance

5:48 pm – 5:56 pm	41 (RF) A Survey of 2018 Integrated Vascular Surgery Applicants and Trends in the Integrated Vascular Surgery Match Mark Conant ¹ , James Brooks ¹ , Murray Shames ¹ , Jason T. Lee ² , Jeffrey Jim ³ - ¹ University of South Florida, Tampa, FL; ² Stanford University, Stanford, CA; ³ Washington University St. Louis, St. Louis, MO
5:56 pm – 6:04 pm	42 (RF) Vascular Access Types and Outcomes Vary Significantly by Race and Ethnicity Timothy Copeland, Peter F. Lawrence, Karen Woo - UCLA, Los Angeles, CA
7:00 pm – 10:00 pm	PRESIDENT'S DINNER

Sunday, February 3, 2019

6:30 am – 7:00 am	Continental Breakfast
6:30 am – 9:00 am	Registration
7:00 am – 9:00 am	SCIENTIFIC SESSION V Moderators: James Black, MD & Caitlin Hicks, MD
7:00 am – 7:12 am	43 Selective Use of Anticoagulation or Dual Antiplatelet Therapy for Patients with Extra-Anatomic Bypasses Victoria G. Teveris ¹ , Jesse Columbo ¹ , Peter Bartline ² , Philip Goodney ¹ , David Stone ¹ , Bjoern Suckow ¹ - ¹ Dartmouth-Hitchcock Medical Center, Lebanon, NH; ² University of Wisconsin, Madison, WI
7:12 am – 7:24 am	44 Sexual Harassment in Vascular Surgery Training Programs Melanie Nukala ¹ , Mollie Freedman-Weiss ² , Peter Yoo ² , Matthew R. Smeds ¹ - ¹ Saint Louis University, Saint Louis, MO; ² Yale University, New Haven, CT
7:24 am – 7:36 am	45 Superior Short- and Long-Term Cardiovascular Morbidity and Mortality in Patients Undergoing PTFE Tibial/Peroneal Arterial Revascularization Compared to Primary Amputation Nicholas J Gargiulo, III - The Brookdale University Hospital & Medical Center, Mineola, NY
7:36 am – 7:44 am	46 (RF) Ambulatory Status Following Major Lower Extremity Amputation Katherine P. MacCallum, Patricia Yau, Karan Garg - Montefiore Medical Center, Bronx, NY

Schedule-At-A-Glance

7:44 am – 7:52 am	47 (RF) Virtual Histology of Human Arterial Wall Segments Using Microcomputed Tomography for Soft Tissue Imaging Scott T. Robinson ¹ , Ruth Levey ¹ , Eimear Dolan ¹ , David Connolly ¹ , Marcus Chin ¹ , Nicholas H. Osborne ² , Peter Dockery ¹ , Peter K. Henke ² , Garry P. Duffy ¹ - ¹ NUI Galway, Galway, Ireland; ² University of Michigan, Ann Arbor, MI
7:52 am – 8:00 am	48 (RF) Ambulatory Patients Undergoing Above-Knee Amputation Have Significantly Higher Post-Operative Mortality Compared to Non-Ambulatory Patients Patricia Yau ¹ , Charles DeCarlo ² , Katherine Maccallum ¹ , Patricia Friedmann ³ , Larry Scher ¹ , Saadat Shariff ¹ , Evan Lipsitz ¹ , Karan Garg ¹ - ¹ Montefiore Medical Center, Bronx, NY; ² Massachusetts General Hospital, Boston, MA; ³ Albert Einstein College of Medicine, Bronx, NY
8:00 am – 8:12 am	49 Early Real World Experience with Endoanchors Based on Indication Vy T. Ho, Elizabeth L. George, Anahita Dua, Kedar S. Lavingia, Michael D. Sgroi, Michael D. Dake, Jason T. Lee - Stanford University, Stanford, CA
8:12 am – 8:24 am	50 Factors Associated with Amputation after Peripheral Vascular Intervention (PVI) for Intermittent Claudication in the Vascular Quality Initiative (VQI) John C. Axley ¹ , Zdenek Novak ¹ , Salvatore T. Scali ² , Mark A. Patterson ¹ , Benjamin J. Pearce ¹ , Graeme E. McFarland ¹ , Emily S. Spangler ¹ , Marc A. Passman ¹ , Adam W. Beck ¹ - ¹ University of Alabama at Birmingham, Birmingham, AL; ² University of Florida College of Medicine, Gainesville, FL
8:24 am – 8:36 am	51 Digital Pedometer Based Outcome Monitoring for Patients Undergoing Intervention for Intermittent Claudication Reid Ravin ¹ , Ageliki Voyouka ² , Rami Tadros ² , Daniel Han ² , Daniel Fremed ³ , Peter Faries ² - ¹ Mount Sinai West Hospital, New York, NY; ² Mount Sinai Hospital, New York, NY; ³ The Cardiovascular Care Group, Livingston, NJ
8:36 am – 8:48 am	52 Midterm Outcomes of Nellix EVAS According to Revised Instructions For Use Kevin N. Peek, Manar Khashram - Auckland District Health Board, Auckland, New Zealand

Schedule-At-A-Glance

8:48 am – 9:00 am

53

**Frailty Syndrome in Patients with Carotid Disease:
Simplifying How We Calculate Frailty**

Viraj Pandit, Sandeep Jahjj, Ashton Lee, Bradley Trinidad,
Kaoru Goshima, Craig Weinkauff, Wei Zhou, Tze-Woei Tan -
University of Arizona, Tucson, AZ

9:00 am

Annual Meeting Adjourns



Notes

Full Program & Abstracts

Thursday, January 31, 2019

7:00 am – 5:00 pm	Registration
8:15 am – 12:15 pm	VESS VASCULAR FELLOWS' COURSE
8:15 am – 12:15 pm	VESS STUDENT MENTOR PROGRAM
10:30 am – 11:00 am	Coffee Break
12:30 pm – 1:30 pm	Fellows /Students Lunch
2:30 pm – 5:30 pm	VESS VASCULAR TECHNOLOGY FORUM (Didactic & Hands-On)
5:30 pm – 7:00 pm	WELCOME RECEPTION All attendees, guests & exhibitors are welcome.

Friday, February 1, 2019

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
7:00 am – 9:15 am	SCIENTIFIC SESSION I Moderators: Jonathan Eliason, MD & Justin Hurie, MD
7:00 am – 7:12 am	1 The Rates of Endovascular Tibial Intervention are Increasing without Affecting the Rates of Major Amputations Peng Zhao, Javier Bautista, Joseph J. Guido, Elaine L. Hill, Gary R. Morrow, Adam J. Doyle, Jennifer L. Ellis, Kathleen G. Raman, Michael C. Stoner, Roan J. Glocker - University of Rochester, Rochester, NY

INTRODUCTION: Endovascular tibial interventions are becoming more frequently performed, often in an outpatient setting. It is unclear whether the increased number of endovascular tibial interventions is associated with a decrease in major amputation. Our study compares the rates of endovascular tibial intervention, tibial bypass, and major amputation in current practice.

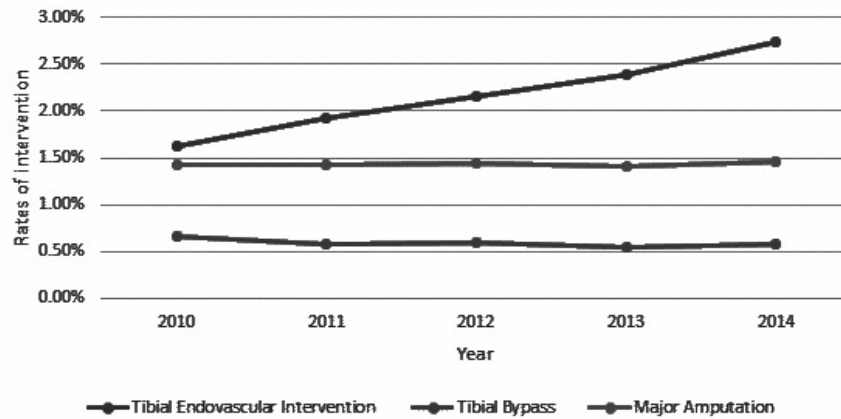
METHODS: Procedural data from 2010 to 2014 were abstracted from a 5% CMS dataset. Procedural rates were normalized to the prevalence of atherosclerosis. Trends in endovascular tibial intervention, tibial bypass, and major amputation were analyzed.

RESULTS: The rate of tibial intervention increased from 1.63% to 2.73%. Rate of tibial bypass remained stable at 0.6% and the rate of major amputation stayed relatively constant at 1.43%. Regression analysis showed that tibial intervention significantly increased over the five-year period ($p=0.0002$), whereas the rates of bypass and amputation did not change. The number of outpatient tibial interventions increased from 2010 to 2014 ($p=0.0027$). The majority of the increase in the rate of tibial interventions were in the outpatient setting.

Full Program & Abstracts

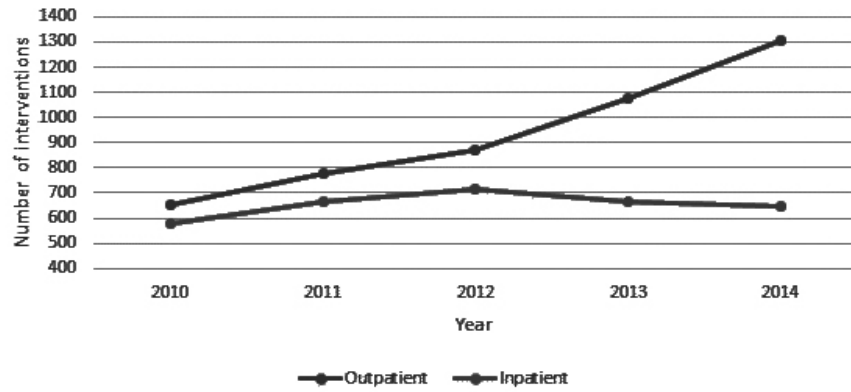
CONCLUSION: The rate of endovascular tibial intervention is increasing, almost entirely in the outpatient setting without a resultant decrease in major amputation. These data suggest that endovascular tibial interventions are being overutilized without benefit to patients.

Figure 1. Rates of Endovascular Tibial Intervention, Tibial Bypass and Major Amputation as a Percentage of Atherosclerotic Disease, 2010-2014



Full Program & Abstracts

Figure 2. Number of Outpatient and Inpatient Endovascular Tibial Interventions Performed in 2010 to 2014, Based on a 5% Random Sample CMS Dataset



Full Program & Abstracts

7:12 am – 7:24 am

2

Endovascular Aneurysm Repair Cost Varies by Complication Type and Center but Not by Endograft Manufacturer

Zachary J. Wanken¹, Spencer W. Trooboff¹, Barbara Gladders², Art Sedrakyan³, Jesse A. Columbo¹, Bjoern D. Suckow¹, David H. Stone¹, Philip P. Goodney¹ - ¹Dartmouth-Hitchcock Medical Center, Lebanon, NH; ²The Dartmouth Institute, Lebanon, NH; ³Weill-Cornell Medical School, New York City, NY

INTRODUCTION/OBJECTIVES: Endovascular aortic aneurysm repair (EVR) is a costly procedure. Prior cost analysis studies have been limited to single centers or failed to report the individual factors associated with payment variation. We describe the cost of EVR for a national cohort of Medicare patients studied in the Vascular Quality Initiative (VQI) and evaluate determinants of high cost index hospitalizations.

METHODS: We examined Medicare-VQI matched patients undergoing EVR from 2003-2015. The analytic cohort was limited to patients who were fully covered by Medicare part A&B fee-for-service in the year of their operation. Index hospitalization costs were determined using the amount paid by Medicare for inpatient institutional and professional fees. Descriptive analysis was performed to evaluate cost variation by complication type, graft manufacturer, and VQI center.

RESULTS: The analytic cohort comprised 10,156 patients undergoing EVR. The mean cost of EVR was \$27,487 (SD=\$15,770). Patients experiencing any complication (8.7%, n=884) had a higher mean cost of index surgery (\$45,542, SD=\$36,669 vs. \$25,766, SD=\$10,502 without complication). Intestinal ischemia, respiratory failure and surgical site infections were the costliest complications, incurring an incremental mean cost of care of \$41,476, \$36,730, and \$34,593 respectively (Figure 1). Mean payments stratified by endograft manufacturer ranged from \$26,486 to \$30,577 (Figure 2), and mean costs per center ranged from \$19,123 to \$56,122.

CONCLUSION: EVR costs incurred by Medicare vary by complication status and center, but relatively little by graft manufacturer. Controlling EVR cost requires strategies to mitigate costly complications and reduce variation between centers.

Full Program & Abstracts

Figure 1. Medicare Payment Cost by Complication Type

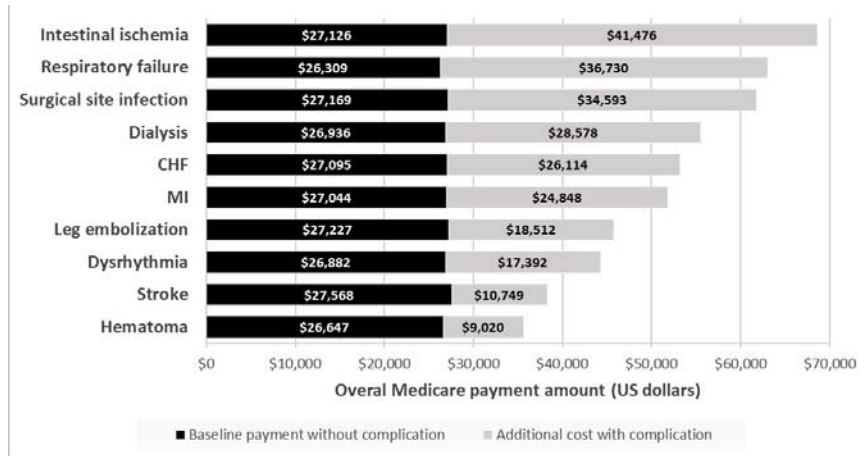
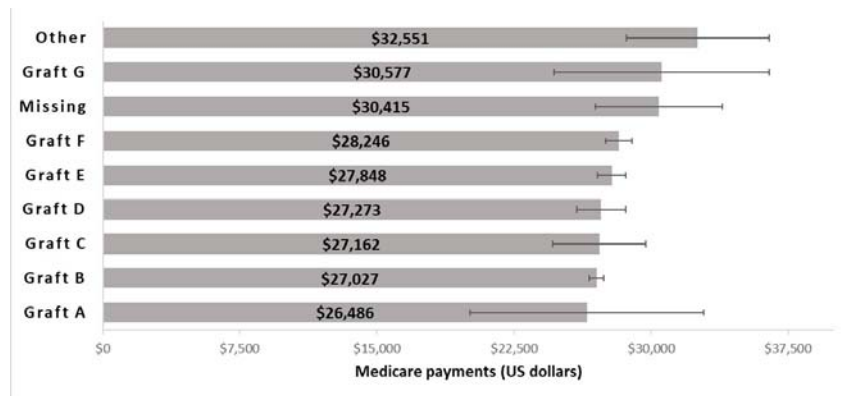


Figure 2. Medicare Payment Amount Stratified by Endograft Manufacturer



Full Program & Abstracts

7:24 am – 7:36 am

3

Are Volume Standards for Open AAA Repair Realistic?
Margaret E. Smith, Danielle C. Sutzko, Jonathan L. Eliason,
Peter K. Henke, Nicholas H. Osborne - University of
Michigan, Ann Arbor, MI

INTRODUCTION AND OBJECTIVES: Volume-outcome relationships exist for many complex surgical procedures, prompting institutions to adopt surgical volume standards for credentialing. The current hospital annual volume standard for open abdominal aortic aneurysm repair (oAAA) is 15. However, this is primarily based off data from the 1990's and may not be appropriate given the dramatic decline in oAAA. We sought to quantify the proportion of hospitals meeting volume standards, the difference in mortality between low- and high-volume hospitals, and the potential impact of volume credentialing on patients.

METHODS: We identified patients age ≥ 65 years undergoing oAAA in 2013 - 2014 Medicare claims data. Hospital annual volume was calculated. Since Medicare represents ~55% of the payer mix for AAA, volumes were adjusted to reflect all payers. Hospitals were stratified into oAAA volume cohorts: <5 /year, 5-9/year, 10-14/year, and ≥ 15 /year. Risk-adjusted mortality rates were calculated for each hospital and compared across cohorts.

RESULTS: 11,655 oAAA were performed at 1,445 hospitals between 2013-2014. The average hospital oAAA annual volume was 7.8 (SD 9.3) with a median of 4.5. Amongst the 1,445 hospitals, only 190 (13.1%) performed ≥ 15 oAAA per year. 756 hospitals (53.3%) performed <5 per year. 337 hospitals (23.3%) performed 5-9 oAAA/year and 162 hospitals (11.2%) performed 10-14 oAAA/year. Among patients who underwent oAAA in 2014, 5,395 (53.3%) received care at a hospital that performed <15 per year. Notably, there was no difference in mortality between hospitals that performed <5 oAAA and ≥ 15 per year (5.7% vs 5.6%; $p=0.1249$).

CONCLUSIONS: By conservative estimates, only 13% of hospitals performing oAAA meet current volume standards. Triaging patients to these hospitals would require shifting over 5,000 patients annually. Implementation of current oAAA volume standards will likely impose unreasonable travel burdens on patients and exaggerate health care disparities for vulnerable populations without any improvement in clinical outcomes.

Full Program & Abstracts

7:36 am – 7:48 am

4

Incidence and Risk Factors for Deep Vein Thrombosis after Ablation of Superficial Lower Extremity Veins

Nathan K. Itoga, Celine Deslarzes-Dubuis, Kara A. Rothenberg, Elizabeth George, Venita Chandra, E. John Harris - Stanford University, Stanford, CA

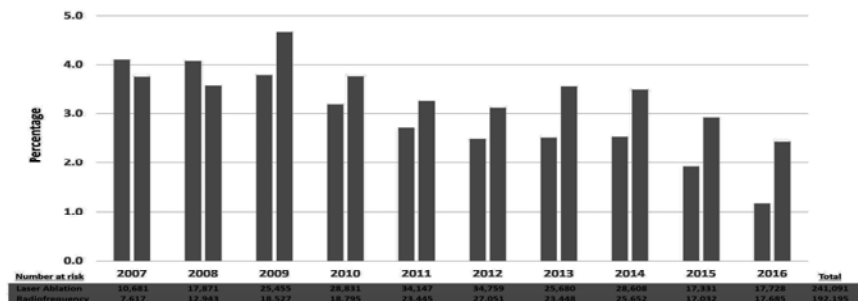
INTRODUCTION: Deep vein thrombosis (DVT) is a rare complication after venous ablation procedures. We sought to describe the incidence of DVT after radiofrequency ablation (RFA) and laser ablation (LA).

METHODS: The Truven Health Marketscan database, a national private insurance claims database, was queried from 2007-16 to identify patients undergoing RFA or LA. Patients were included if a follow-up duplex ultrasound was performed within 30-days. The primary outcome was DVT at 7-days and 30-days identified by ICD-9 and ICD-10 codes. Multivariable regression was used to evaluate risk factors for developing a new DVT, expressed as odds-ratios and 95% confidence interval (OR 95%CI).

RESULTS: A total of 256,999 patients underwent 433,286 procedures: 192,195 (44.4%) RFA and 241,091 LA. Of these, 8,203 (1.9%) had a newly diagnosed DVT within 7-days and 13,347 (3.1%) had a DVT within 30-days. Comparison of RFA and LA demonstrated a lower incidence of 30-day DVT for LA (2.8%) compared to RFA (3.4%), $P < .001$. The incidence of 30-day DVT trended downward 2009-16 for both procedures, see Figure. On multivariable regression, LA (OR 0.83, 95% CI 0.80-0.85), female gender (OR-0.75, 95%CI 0.72-0.78) and sclerotherapy (OR-0.91, 95%CI 0.84-0.97) was associated with a decreased risk for 30-day DVT. Factors associated with an increased risk were a diagnosis of peripheral artery disease (OR-1.21, 95%CI 1.13-1.28), lower extremity wounds (OR-1.23, 95%CI 1.16-1.30) and stab phlebectomy (OR-1.43, 95%CI 1.37-1.49).

CONCLUSIONS: The incidence of newly diagnosed DVT within 30-days after an ablation procedure was 3.1%, but significantly higher than 7-day rates. DVT after ablation procedures has decreased in recent years indicating improved safety, but standard venous duplex follow-up within 7 days may be inadequate, and may need to be extended.

Figure 1. Incidence of DVT at 30 Days after Lower Extremity Venous Ablation



Full Program & Abstracts

7:48 am – 7:56 am

5 (RF)

Vascular Complications Following Percutaneous Femoral Arterial Access at a Multi-Disciplinary Institution

Danielle R. Lyon, Timothy M. Sullivan, Andrew H. Cragg, Peter B. Alden, Jesse M. Manunga, Elliot J. Stephenson, Jessica M. Titus, Joseph Karam, Xiaoyi Teng, Jason Q. Alexander - Minneapolis Heart Institute Foundation, Minneapolis, MN

INTRODUCTION AND OBJECTIVES: The number of complex cases requiring percutaneous femoral arterial access is increasing. With the trend toward minimally invasive procedures, the pool of patients at risk for percutaneous complications has similarly increased. Severe complications that threaten life and limb often require vascular surgical intervention. This study evaluates vascular surgical complications following percutaneous femoral arterial access over a seven year span at a multidisciplinary center. Trends over time, between disciplines and practitioners as well as vascular closure device (VCD) usage were identified.

METHODS: Retrospective review of all patients undergoing percutaneous femoral arterial access at a multi-disciplinary institution between January 1, 2009 and March 1, 2016. Patient demographics, intraoperative and postoperative details, complications, and outcomes were analyzed.

RESULTS: Over the study period; 36,849 percutaneous femoral arterial access procedures were performed. 144 (0.39%) patients had complications requiring vascular surgical repair. Trends over time were evaluated by dividing the time span into three groups. Vascular complications were 0.49% (55/11,114) in group 1 (January 2009-August 2011), 0.31% (36/11,603) in group 2 (August 2011-January 2014) and 0.38% (53/14,132) in group 3 (January 2014-March 2016). Complications occurred in 0.38% (87/22,954) procedures using VCD. Manual compression resulted in a rate of 0.41% (57/13,895). Interventional cardiology was responsible for 66% of complications, followed by interventional radiology (13%), interventional neuroradiology (11%) and vascular surgery (10%). Complication rates were not statistically different between specialties. Subgroup analysis of individual practitioners however, demonstrated a difference in complication rates (.25 to 2.4%, $p=.007$) favoring practitioners who utilized ultrasound guided puncture (.47% vs 1.1%).

CONCLUSIONS: Surgical complications following percutaneous femoral arterial access have remained steady over time despite an increase in VCDs. No difference in complication rates is appreciated between specialties but there is a difference between individual practitioners favoring proceduralists who utilize ultrasound.

Full Program & Abstracts

7:56 am – 8:04 am

6 (RF)

The Impact of Achieving a Normal ABI on Patency and Limb Salvage after Peripheral Vascular Intervention

Zdenek Novak, Johnston L. Moore, John C. Axley, Emily L. Spangler, Benjamin J. Pearce, Graeme E. McFarland, Mark A. Patterson, Marc A. Passman, Adam W. Beck - University of Alabama at Birmingham School of Medicine, Birmingham, AL

INTRODUCTION AND OBJECTIVES: The ideal outcome of PVI is a normal ABI. We sought to determine the impact of hemodynamic result after PVI on 1-year patency.

METHODS: Elective unilateral PVI cases with 1-year f/u were identified in VQI from 2003-17. Maintenance of normal ABI at 1-year was evaluated, and ABI collected within 0-3 month f/u was used to stratify groups. Cohorts by early post-op ABI were: 0-0.5 (N=44), 0.5-0.9 (N=293) and 0.9-1.3 (N=407). Table 1 demonstrates factors evaluated. Early f/u is not mandatory in VQI, thus patients with and w/o early f/u were compared at 1-year to evaluate for selection bias.

RESULTS: Potential bias between patients with and w/o early f/u showed no difference in major amputation or ABIs. 63.1% of those with normal early ABI maintained at f/u, and none required major amputation. Treatment of the CFA, SFA, peroneal artery (listed as index vessel) and length of treatment were associated with decreasing f/u ABI. Of patients discharged with suboptimal ABI, 22.5% reached normal ABI at f/u, and 1 major amp occurred. Preoperative ABI below 0.9 was predictive of poor result at 1-year; however, TP trunk PVI and vessel diameter predicted a maintained ABI (Table 2).

CONCLUSIONS: In patients with normal ABIs at 0-3 months, 1-year outcomes are dependent on the treatment length and location. However, in patients with suboptimal postop ABIs, the most important predictive factor is the pre-op ABI, suggesting that every attempt should be made to maximize the hemodynamic result of PVI and achieve a normal ABI when possible.

Full Program & Abstracts

Table 1. Demographics, Risk Factors and Treatments

Variable	Discharge ABI 0.9-1.3 (n=407)			Discharge ABI 0.5-0.9 (n=293)		
	LTF ABI 0.9-1.3	LTF ABI <0.9	p	LTF ABI 0.9-1.3	LTF ABI <0.9	p
Age (mean ± SD)	67.02 ± 10.21	66.87 ± 12.58	0.901	66.59 ± 10.33	70.74 ± 9.47	0.002
Preop ABI	0.68 ± 0.23	0.63 ± 0.21	0.051	0.66 ± 0.23	0.56 ± 0.25	<0.001
Female gender	101 39.3%	75 50.0%	0.036	25 37.9%	120 52.9%	0.032
Non-white	60 23.3%	37 24.7%	0.763	13 19.7%	45 19.8%	0.982
Hispanic/Latino	13 5.1%	7 4.7%	0.860	3 4.5%	9 4.0%	0.834
COPD	53 20.6%	23 15.3%	0.187	13 19.7%	52 22.9%	0.581
HD	4 1.6%	3 2.0%	0.740	1 1.5%	4 1.8%	0.892
DM	94 36.6%	60 40.0%	0.492	26 39.4%	113 49.8%	0.137
CAD	58 22.6%	29 19.3%	0.443	17 25.8%	66 29.1%	0.599
HTN	211 82.1%	134 89.3%	0.050	59 89.4%	207 91.2%	0.657
Smoking	220 85.9%	115 77.2%	0.025	52 78.8%	182 80.2%	0.804
Leg symptoms			0.354			0.002
ASX	12 4.7%	4 2.7%		2 3.0%	4 1.8%	
Claudication	172 66.9%	99 66.0%		38 57.6%	127 55.9%	
Moderate Claudication	14 5.4%	7 4.7%		8 12.1%	8 3.5%	
Rest Pain	23 8.9%	9 6.0%		10 15.2%	34 15.0%	
Tissue Loss	24 9.3%	21 14.0%		1 1.5%	42 18.5%	
Acute Ischemia	10 3.9%	10 6.7%		7 10.6%	11 4.8%	
Not Treated	2 0.8%	0 0.0%		0 0.0%	1 0.4%	
Number of treated arteries			0.302			0.678
1	175 68.1%	90 60.0%		45 68.2%	142 62.6%	
2	66 25.7%	45 30.0%		16 24.2%	71 31.3%	
3	12 4.7%	10 6.7%		4 6.1%	8 3.5%	
4	4 1.6%	5 3.3%		1 1.5%	5 2.2%	
5	0	0		0 0.0%	1 0.4%	
First treatment type			0.459			0.249
Balloon	172 66.9%	106 70.7%		39 59.1%	163 71.8%	
Stent/Balloon	42 16.3%	16 10.7%		13 19.7%	39 17.2%	
Stent Graft	10 3.9%	4 2.7%		4 6.1%	7 3.1%	
Cutting/Special Balloon	10 3.9%	6 4.0%		3 4.5%	5 2.2%	
Atherectomy	23 8.9%	18 12.0%		7 10.6%	13 5.7%	

Full Program & Abstracts

Table 2. Multivariate Logistic Regression Results (Dependent Variable—LTF ABI Drop Below 0.9 at 1 Year). Only Significant Variables Shown.

3mo ABI		OR	95% C.I. for OR		P-value
			Lower	Upper	
0.9-1.3	CFA PVI*	4.054	1.249	13.16	0.020
	SFA PVI*	2.917	1.508	5.644	0.001
	Peroneal a. PVI*	15.662	2.842	86.292	0.002
	Length tr a.	1.034	1.001	1.069	0.045
0.5-0.9	TP trunk PVI*	0.124	0.016	0.96	0.046
	Diameter tr a.	0.757	0.587	0.976	0.032
	Preop ABI 0-0.2 [#]	20.158	1.038	391.354	0.047
	Preop ABI 0.2-0.5 [#]	17.786	2.241	141.13	0.006
	Preop ABI 0.5-0.9 [#]	9.467	1.325	67.639	0.025

* reference to iliac a. and above # reference ABI 0.9-1.3

Full Program & Abstracts

8:04 am – 8:12 am

7 (RF)

Underutilization of Non-Opioid Pain Medication in Patients Undergoing AAA Repair

John Phair¹, Dov Levine², Larry Scher¹, Karan Garg¹ -

¹Montefiore Medical Center, Bronx, NY; ²Albert Einstein College of Medicine, Bronx, NY

OBJECTIVES: To describe rates and risk factors for postoperative use of opioids in patients undergoing AAA repair as well as identify pain modalities that are underutilized.

METHODS: We retrospectively analyzed pain medication prescriptions in the perioperative period for endovascular (EVAR) and open AAA repair. The EVAR group was further subdivided into percutaneous (pEVAR) and cutdown (cEVAR) groups. Primary outcomes were post-operative and discharge pain medication prescriptions; measured in morphine milligram equivalents (MMEs) and perioperative pain scores.

RESULTS: Open repair had increased post-operative pain reported compared to EVAR (2.67+/-0.75 vs 0.96+/-0.19, p<0.01). Adjunctive epidural reduced perceived post-operative pain for open repair (0.77 +/-0.48 vs 3.50 +/-0.96 p<0.01). During admission, EVAR had significantly less number of post-operative opioid prescriptions as compared to open repair (73.91% vs 100%, p<0.01). Patients with bilateral cutdowns as opposed to a single cutdown received more opioid prescriptions than pEVAR patients (84.44 vs 65.8% p=0.036). Those undergoing percutaneous repair had significantly less MME use during hospitalization compared to femoral cutdown, 17+/-3.52mg vs 31.90+/-5.43mg, respectively (p<0.01). Tylenol use was not significantly different in the open group compared to EVAR repair (25% vs 36%, p=0.29). NSAIDs were rarely used in the post-operative period for open or EVAR (8.3% vs 1.1%). pEVAR patients reported less pain at discharge compared to cEVAR patients (0.18+/-0.12 vs 0.88+/-0.29, p=0.036). pEVAR and cEVAR patients received similar number of prescriptions for opioids with no significant difference in MMEs (29.26% vs 27.45, p=0.84144+/-14.48 vs 134 +/-27.00, p=0.76). Open and EVAR had comparable low rates of NSAID and acetaminophen prescriptions at discharge.

CONCLUSIONS: AAA patients are predominantly treated with opioid pain medications with few adjunctive therapies. Intraoperative epidural and pEVAR may aid in decreasing the total MME of opioids used. However, the total number of opioid prescribed are similar for pEVAR and cEVAR despite the difference in approach.

Full Program & Abstracts

8:12 am – 8:24 am

8

Endovascular Creation of an Arteriovenous Fistula with a Next Generation 4 Fr Device Design for Hemodialysis Access: Clinical Experience from the EASE Study

Todd Berland, Greg Westin, Jason Clement, Joe Griffin, Mike Sadek, Sheila Blumberg, Mike Barfield, Tom Maldonado - New York University, New York, NY

INTRODUCTION: To describe our clinical experience in using the next generation endoAVF system with a 4Fr catheter profile for endovascular creation of an arteriovenous fistula (AVF) in hemodialysis patients.

METHODS: This was a multi-operator, single-arm, prospective study intended to evaluate safety and efficacy of a 4Fr endovascular AVF (endoAVF) system for the creation of a vascular access in hemodialysis patients. Patients were followed at regular intervals through 6 months to determine procedural, maturation, and cannulation success as well as intervention rate and patency.

RESULTS: From May to November 2016, 32 patients underwent the endoAVF procedure with no device-related adverse events. An endoAVF was successfully created in the proximal forearm for all 32 patients. The device successfully created an endoAVF in every patient for a technical success rate of 100%(32/32). The device- or procedure-related serious adverse event rate was 3%(1/32); one patient experienced a venous guidewire perforation successfully managed with a stent graft. Primary and cumulative patency rates through 6 months were 83% and 87%, respectively, with an intervention rate of 0.21 per patient-year. Physiological suitability, as defined by target flow rates ≥ 500 ml/min and cannulation vessel diameters ≥ 4 mm, were achieved in 91%(29/32) of patients by 90 days. Successful 2-needle cannulation was achieved in 78%(21/27) by 90 days, with mean time to cannulation of 43 ± 14 days. Functional cannulation, as defined by successful 2-needle cannulation for two-thirds of the dialysis sessions within 1 month, was achieved in 95% (20/21) of the patients that were successfully cannulated for an overall rate of 74%(20/27). No patient that achieved functional cannulation required an intervention to assist in maturation.

CONCLUSIONS: The 4Fr endoAVF system allowed physicians multiple access and fistula creation site options to tailor the procedure to individual patient anatomy. High procedure success and unassisted functional cannulation success were observed with minimal complications.

Full Program & Abstracts

8:24 am – 8:35 am

9

Management of Concomitant Vein Injury in the Setting of Military Popliteal Artery Trauma: Limb Outcomes Assessment

Jordan L. Guice, Shaun M. Gifford, Kai W. Hata, Xiaoming Shi, Brandon W. Propper, David S. Kauvar - San Antonio Military Medical Center, Fort Sam Houston, TX

INTRODUCTION: Despite aggressive limb salvage attempts, military popliteal artery injuries are associated with high amputation rates. Combined arterial and venous injuries present a management dilemma for military surgeons in austere settings and the impact of vein injury management strategy on limb outcomes is not clear.

METHODS: Military casualties sustaining combined ipsilateral popliteal artery and vein injuries from 2003-2016 were identified from a military vascular injury database. Limbs were grouped based on whether venous ligation or repair was initially performed. The primary outcome was secondary amputation; secondary outcomes included limb and vascular/graft complications.

RESULTS: 56 limbs were included, 27 (48%) managed with vein ligation and 29 (52%) with repair. Veins were repaired primarily in 13 (45%) cases with the remainder treated with interposition grafts. Median ISS was higher in the ligation group (19 vs 15, $P=.09$) but vascular and concomitant limb injury characteristics were similar. Amputation rate did not differ by vein treatment (45% repair vs. 41% ligation, $P=.76$) and this held with injuries above and below the knee considered independently. Most (71%) amputations were performed <30 days from injury. Amputation was indicated more frequently for vascular repair failure in the ligated group (55% vs 15%, $P=.04$). Four graft infections were all in the repair group ($P=.05$ vs ligation). Arterial graft complications were more frequent with vein repair (45%) than ligation (30%), but this did not reach significance ($P=.24$). Only one deep vein thrombosis was diagnosed in each group ($P=.96$).

CONCLUSIONS: Type of management of concomitant popliteal vein injury was not associated with early or late amputation in this series of military popliteal artery injuries. Vein injury management may have had implications for the development of arterial graft and limb.

Full Program & Abstracts

8:35 am – 8:47 am

10

System-Wide Analysis of Radiation use among Surgical Specialties: Identifying Where Vascular Surgeons Can Improve

Sharon C. Kiang¹, Austin S. Huh², Jessica R. Davis², Hans K. Boggs², Jon W. Floresca², Donald V. Farley², Ahmed M. Abou-Zamzam, Jr.², Roger T. Tomihama² - ¹Veterans Affairs Loma Linda Healthcare System, Loma Linda, CA; ²Loma Linda University Medical Center, Loma Linda, CA

INTRODUCTION AND OBJECTIVES: There is burgeoning understanding of radiation use in vascular surgery. In the era of endovascular therapies, the analysis of radiation use in vascular procedures at a systems based level can help identify high use factors that can lead to quality improvement initiatives.

METHODS: A retrospective review of all operative fluoroscopic guided procedures from 2010-2017 from 3 hospitals in a tertiary academic health care system was performed. Various radiation exposure metrics were collected: fluoroscopy time (FT), cumulative dose (CD), dose area product (DAP) and percentage of dose reduction techniques. Cases were categorized into four anatomic surgical fields and top four operative radiation use surgical specialties.

RESULTS: 1,252 cases were analyzed and notable trends were identified across all surgical subspecialties and surgical fields. Vascular surgery averaged 40 times higher radiation exposure than other specialties (613.3 mGy vs 15.6 mGy, $p=0.001$). By surgical field, vascular surgery consistently utilized more radiation. In the abdomen/pelvis, vascular surgery averaged 11.6 times higher CD than orthopedic surgery (429.2 mGy vs. 36.8, $p=0.001$), 8.7 times higher than neurosurgery (429.2 mGy vs. 49.1 mGy, $p=0.001$) and 64 times higher than urology (429.2 mGy vs. 6.7 mGy, $p=0.001$). However, vascular surgeons utilized dose reduction techniques less frequently than urology (21.5% vs 70%, $p=0.001$) but more than neurosurgery and orthopedics (21.5% vs 1.3%, and 21.5% vs 0%, $p=0.001$), respectively.

CONCLUSIONS: A system-wide healthcare analysis identified vascular surgery with higher radiation usage compared to all other subspecialties regardless of surgical field. However, vascular surgeons utilized dose reduction techniques less frequently. Decreasing magnification and increased pulsed fluoroscopy use may decrease radiation exposure. These data can serve as baseline information for future specialty specific quality improvement initiatives.

Full Program & Abstracts

8:47 am – 8:55 am

11 (RF)

Contemporary Upper Extremity Vascular Injury in Combat

Matthew Vuoncino, Andrew J. Soo Hoo, Paul W. White, Todd E. Rasmussen, Joseph M. White - Walter Reed National Military Medical Center, Bethesda, MD

OBJECTIVES: The incidence of wartime upper extremity vascular injury (UEVI) has been stable for the past century. The objective of this study is to provide a contemporary review of wartime UEVI, including epidemiologic characterization and description of early limb loss.

METHODS: The Department of Defense Trauma Registry (DoDTR) was queried to identify U.S. service members who sustained a battle-related UEVI in Afghanistan between January 2009 and December 2015. Anatomic distribution of injury, mechanism of injury (MOI), associated injuries, early management, and early limb loss were analyzed.

RESULTS: Analysis identified 247 casualties who sustained 308 UEVI. The most common injury was to the vessels distal to the brachial bifurcation (63.3%, n=185), followed by the brachial vessels (27.3%, n=84) and the axillary vessels (9.4%, n=29). The predominant MOIs were penetrating explosive fragments (74.1%, n=183) and gunshot wounds (25.9%, n=64). Associated fractures were identified in 151 (61.1%) casualties, and nerve injuries in 133 (53.8%). Angiography was performed in 91 (36.8%) patients, and endovascular treatment was performed 11 (4.5%) times. Temporary vascular shunts were utilized in 39 (15.8%) casualties, and surgical bypass was completed in 19 UEVI (7.7%). The early limb loss rate was 12.1% (n=30). For all of the casualties sustaining early limb loss, the MOI was penetrating explosive fragments, the average injury severity score (ISS) was 32.3 and the mortality was 6.7% (n=2). In those without amputation, the ISS and mortality were lower at 20 and 4.6% (n=10), respectively. Overall mortality was 4.9% (n=12).

CONCLUSIONS: The early limb loss rate was significant especially when compared to initial descriptions from Operation Iraqi Freedom. Amputations are associated with a higher ISS. Improved data capture and fidelity, or differing MOIs, may account for this trend. Proficiency with open and endovascular therapy remains a critical focus for combat casualty care.

Full Program & Abstracts

8:55 am – 9:03 am

12 (RF)

A Systematic Review and Meta-Analysis Comparing Abdominal Aortic Aneurysm Repair Outcomes Between Obese and Non-Obese Patients

Ian Wee¹, Hao Yun Yap², Edward Choke², Tze Tec Chong² -
¹Yong Loo Lin School of Medicine, National University of Singapore, Singapore; ²Singapore General Hospital, Singapore

INTRODUCTION: Obesity is a global epidemic with rising prevalence, and is a potential risk factor portending poor surgical outcomes. Using body mass index (BMI) as an objective marker, this study aims to compare outcomes of abdominal aortic aneurysm (AAA) repair between obese and non-obese adult patients.

METHODS: This study was performed in accordance to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The risk ratio (RR) and mean difference (MD) for dichotomous and continuous outcomes respectively were calculated and pooled.

RESULTS: A total of 9 cohort studies were included, comprising 45,938 patients, of which 30.4% were obese, and 69.6% were non-obese. Endovascular aneurysm repair (EVAR) was performed in 76.0%, and open repair was performed in 23.0%. There was a significantly 20% increased risk of 30-day morbidity in obese patients (RR 1.21, 95% CI 1.04-1.42, P=0.02, I²=87%), particularly in open repair, but no significant difference in 30-day mortality (RR 1.04, 95% CI 0.87-1.24, P=0.67, I²=48%). When classifying complications, there was a significantly 35% and 94% increased risk of renal complications (RR 1.35, 95% CI 1.23-1.49, P<0.00001, I²=34%) and wound infection (RR 1.94, 95% CI 1.68-2.24, P<0.00001, I²=45%) respectively in obese patients. The length of surgery was also found to be longer in the obese group compared to the non-obese group (MD 19.23, 95% CI 5.10-33.35, P=0.008, I²=92%), particularly in open repair. No significant difference was noted in the length of hospital stay. Compared to non-obese patients, morbidly-obese patients had a 60% and 125% increased risk of 30-day morbidity (RR 1.62, 95% CI 1.28-2.04, P<0.0001, I²=94%), and wound infections (RR 2.25, 95% CI 1.58-3.21, P<0.00001, I²=64%) respectively.

CONCLUSION: Obese patients undergoing AAA repair are at increased risk of major morbidity, particularly wound infection. When counselling patients for AAA repair, obesity should be considered as a separate significant risk factor.

10:00 am – 12:00 pm

ROUND TABLE DISCUSSIONS (Optional Programming)
Career Options for Young Surgeons (Pros and Cons of Academic vs. Private Practice)
See page 9 for more information

3:00 pm

Registration Re-Opens

3:30 pm – 4:00 pm

Coffee Break

Full Program & Abstracts

4:00 pm – 6:00 pm

SCIENTIFIC SESSION II

Moderators: Faisal Aziz, MD & Andrew Metzler, MD

4:00 pm – 4:12 pm

13

Lowering the Ankle Brachial Index Threshold in Blunt Lower Extremity Trauma May Prevent Unnecessary Imaging

Jake F. Hemingway, Enock A. Adjei, Sarasijhaa K. Desikan, Joel A. Gross, Nam T. Tran, Niten Singh, Elina Quiroga - University of Washington, Seattle, WA

INTRODUCTION AND OBJECTIVES: Current algorithms for the management of blunt lower extremity trauma recommend additional imaging if the ankle-brachial index (ABI) is less than 0.9. The aim of this study was to analyze lower extremity Computed Tomography Angiographies (CTAs) to determine the incidence and characteristics of patients sustaining vascular injury from blunt lower extremity trauma. We hypothesized that a lower ABI threshold can avoid unnecessary imaging without missing clinically significant vascular injury.

METHODS: A single center, retrospective review of all consecutive patients who presented to a level 1 trauma center with blunt lower extremity trauma and underwent a CTA from January 2015-December 2017 was conducted. Baseline demographics, clinical features, and outcomes were recorded. Patients without documented ABIs were excluded. A receiver operator characteristic (ROC) curve was used to define the ABI threshold.

RESULTS: 125 patients (133 injured limbs) met inclusion criteria. The mean age was 44 years (range 9-96), and 74% of patients were male. A vascular abnormality was identified on CTA in 65 limbs (49%), of which only 8 (12%) required intervention. The ABIs in these injured limbs were between 0 and 0.6 (Figure 1). An ABI threshold of 0.6 maximized the balance between sensitivity (100%) and specificity (87%) and missed no injuries requiring revascularization (Figure 2).

CONCLUSIONS: The ABI remains useful in evaluating blunt lower extremity trauma. A lower ABI threshold may avoid unnecessary imaging without missing vascular injuries. Further prospective studies are needed to validate the safety and effectiveness of a lower ABI threshold.

Full Program & Abstracts

Figure 1. Cumulative Distribution of ABI Values Among Injured and Uninjured Limbs

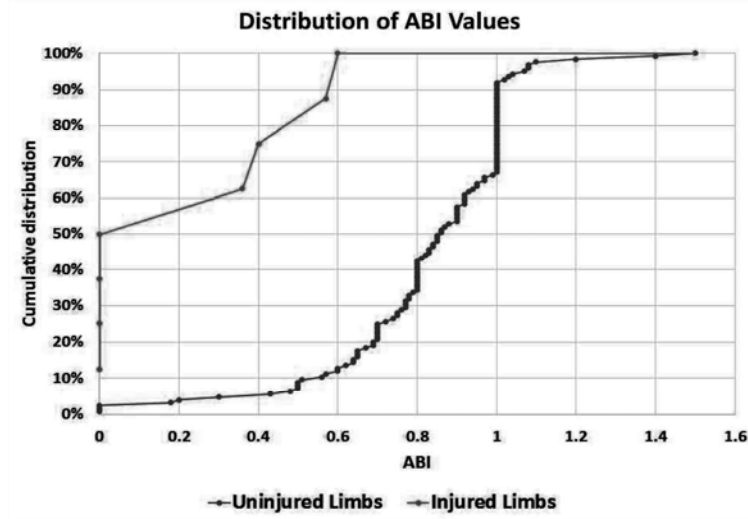
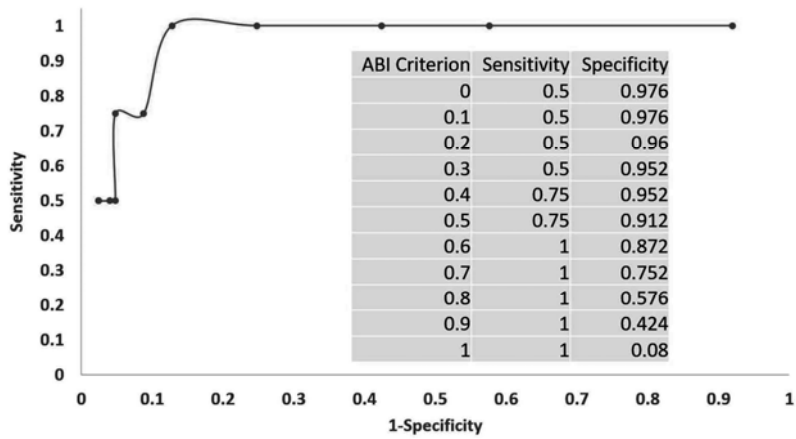


Figure 2. Receiver Operating Characteristic Curve for ABI



Full Program & Abstracts

4:12 pm – 4:24 pm

14

Expedited Arteriovenous Graft Creation for the Super-Elderly Does Not Significantly Decrease Hemodialysis Catheter Time or Short-Term Morbidity

Miles Jackson, Luke Pesonen, Abdulhameed Aziz, Chinmaya Shelgikar, Ahmed Rehan - St. Joseph Mercy, Ann Arbor, Ypsilanti, MI

INTRODUCTION AND OBJECTIVES: ESRD is increasingly pervasive in our aging population. Morbidity of catheter-related infections in the super-elderly can be profound. Autogenous fistula creation, an ideal conduit for dialysis access, takes time to create and mature while catheter-related infections occur. We hypothesized that arteriovenous (AV) graft creation in this particular population (≥ 75 yo) could expedite catheter removal.

METHODS: A retrospective, single-institution study was completed from January 2013 to December 2015 reviewing patients with AV creation over 75 yo. We collated demographics, hemodialysis (HD) catheter placement times, total HD catheter time, and post-operative morbidity. Statistical analyses were used to compare the groups using Student t-test or ANOVA where appropriate.

RESULTS: A total of 70 patients (36 male [51%], 34 female [49%]) were reviewed with average age of 81.7 ± 4.3 years. 52 patients had autogenous AV access creation (74%) with 18 receiving AV grafts (26%). There was no significant difference in age between the fistula (81.8 ± 4.2) and graft (81.3 ± 4.5) populations ($p=0.65$). Time from initial HD catheter placement to surgery was comparable in fistula (7.5 ± 12.5 weeks) and graft (6.0 ± 6.6 , $p=0.65$) groups. Total time of HD catheter duration showed no significant difference between the fistula (22.4 ± 37 weeks) and graft groups (17 ± 17.7 , $p=0.56$). Even when doing a subgroup analysis evaluating placement of Flixene graft ($n=11$), with expedited cannulation, there was no difference in total HD catheter time between groups ($p=0.39$). Morbidity in all patients was low, with minor complications in both groups and no evidence of significant infection at 30 days post-operatively.

CONCLUSIONS: Expedited placement of arteriovenous grafts for the super-elderly did not appreciably decrease total HD catheter times in our retrospective study, even with “early-cannulation” AV grafts. Though placement of AV grafts is an attractive and safe option to decrease catheter-related morbidity, a “fistula-first” paradigm may still be advocated for the super-elderly dialysis population.

Full Program & Abstracts

4:24 pm – 4:36 pm

15

Impact of Staged Vascular Management on Limb Outcomes in Wartime Femoropopliteal Arterial Injury
David S. Kauvar¹, Brandon W. Propper¹, Zachary M. Arthurs¹,
Thomas J. Walters² - ¹San Antonio Military Medical Center,
Fort Sam Houston, TX; ²United States Army Institute of
Surgical Research, Fort Sam Houston, TX

INTRODUCTION: By necessity, wartime arterial injuries undergo staged management. Initial procedures may occur at a Forward Surgical Team (Role 2) where temporary shunts can be placed before transfer to a larger field hospital (Role 3) for definitive reconstruction. Our objective was to evaluate the impact of staging femoropopliteal injury care on limb outcomes.

METHODS: A military vascular injury database was queried for Iraq/Afghanistan casualties with femoropopliteal arterial injuries undergoing attempted reconstruction (2004-2012). Cases were grouped by initial arterial management: shunt placed at Role 2 (R2SHUNT), reconstruction at Role 2 (R2RECON), and initial management at Role 3 (R3MGT). The primary outcome was limb salvage; secondary outcomes were limb-specific complications. Descriptive and intergroup comparative statistics were performed with significance defined at $P \leq 0.05$.

RESULTS: Of 257 cases, all but 4 had definitive reconstruction prior to evacuation to Germany (median 2 days). 46 R2SHUNT, 84 R2RECON, and 127 R3MGT, median MESS was 6 for all groups. R2SHUNT had median extremity AIS-vascular of 4, (other groups 3, $P < .05$) and were more likely to have concomitant venous injury and to undergo fasciotomy. Shunts were used for 5 ± 3 hours. 24% of R2RECON repairs revised at Role 3. Limbs salvage rate of 80% was similar between groups, 62% of amputations performed within 48 hours of injury. Rates of limb and composite graft complications were similar between groups. Thrombosis was more common in R2SHUNT (22%) than R2RECON (6%) or R3MGT (12%), $P = .03$. Late (>48h) thrombosis rates were similar while 60% of R2SHUNT thromboses occurred on day of injury ($P = .003$ vs 25% and 0%).

CONCLUSIONS: Staged femoropopliteal injury care is associated with similar limb salvage to initial Role 3 management. Early thrombosis is likely due to shunt failure but does not lead to limb loss. Current military practice guidelines are appropriate and may inform civilian vascular injury management protocols.

Full Program & Abstracts

4:36 pm – 4:48 pm

16

Discharge to a Facility is Not Protective Against Wound Events Following Emergent Femoral Artery Repair

Joseph M. Anderson, Thomas Brothers, Jacob Robison, Mathew Wooster, Ravikumar Veeraswamy, Rupak Mukherjee, Jean M. Ruddy - Medical University of South Carolina, Charleston, SC

INTRODUCTION: Access site complication is the most common adverse event following endovascular intervention and may significantly increase morbidity. The intent of this project was to identify risk factors for wound events after emergent operative repair of the femoral artery. It was hypothesized that patients discharged to a facility would benefit from ongoing care of medical professionals, with more consistent follow-up and lower wound complication rates.

METHODS: Patients who underwent percutaneous femoral artery access and required subsequent open femoral artery repair at an academic institution between 2015 and 2018 were examined. The primary outcomes of interest included wound complication (infection, wound breakdown requiring more than wet-to-dry dressing, or rehospitalization), discharge disposition, and outpatient follow-up with Vascular Surgery. Chi-square, univariate analysis, and multivariate analysis were completed.

RESULTS: Forty-four patients were identified with emergent femoral artery treatment between 2015 and 2018, and wound complication occurred in 32%. Despite the significant comorbidities and emergent nature of the surgery, only 24% of patients were discharged to a facility. Among those discharged to a rehabilitation or nursing facility, the rate of follow-up to the surgeon's clinic was lower ($p<0.05$), while the incidence of wound complication was greater (44% vs 24%, $p=0.11$). Univariate analysis indicated that kidney disease, albumin $<3\text{g/dL}$, and current smoking were predictive of wound complication. On multivariate analysis, only kidney disease remained predictive ($p<0.05$).

DISCUSSION: Despite the availability of medical personnel to arrange transportation and provide wound care in rehabilitation or nursing facilities, patients who were discharged to such a facility after emergent femoral artery repair experienced lower compliance with follow-up and suffered more wound complications. Improving communication with facilities as well as integrating telehealth may offer opportunities to decrease wound morbidity for these complicated patients.

Full Program & Abstracts

4:48 pm – 4:56 pm

17 (RF)

Penetrating Abdominal Aortic Injury: Comparison of Level I and II Trauma Centers

Brian M. Sheehan, Areg Grigorian, Shelley Maitzel, Boris Borazjani, Nii-Kabu Kabutey, Roy Fujitani, Michael Lekawa, Jeffrey Nahmias - University of California, Irvine Medical Center, Orange, CA

INTRODUCTION AND OBJECTIVES: Penetrating abdominal aortic injury (PAAI) is often lethal, with an associated mortality rate up to 80%. A previous study demonstrated that trauma centers have similar mortality rates when a trauma surgeon is available within 15 minutes. This is more likely with an in-house call system. Surgeons at level-I centers are more likely to take in-house call compared to level-II centers. Therefore, we hypothesized level-I centers will have a lower risk of mortality for PAAI, compared to level-II centers.

METHODS: The Trauma Quality Improvement Program was queried for patients with PAAI, and those treated at level-I centers were compared to those treated at level-II centers. Chi-square, t-test, and multivariable logistic regression models were used for analysis.

RESULTS: From 97,401 penetrating trauma admissions, 534 (0.5%) sustained PAAI. More patients were treated at a level-I center (54.7%), compared to level-II (16.1%). There was a similar median time to hemorrhage control in individuals treated with exploratory laparotomy at the two types of centers (level-I:40.8 minutes vs. level-II:49.2, $p=0.21$). Patients had similar comorbidities and injury severity scores ($p>0.05$) across centers. There was no difference in the number of packed red blood cell units given, intensive care unit length of stay, or ventilator days ($p>0.05$). After controlling for covariates, there was no difference in risk of mortality between level-I and level-II centers (OR=1.01, CI:0.38-2.64, $p=0.99$).

CONCLUSION: Most PAAIs are treated at ACS-level-I centers with hemorrhage control occurring within an hour of arrival in patients requiring laparotomy. There is no difference in morbidity and risk of mortality between level-I and level-II centers, which reinforces the ACS-verification process that aims to achieve comparable clinical results between level-I and level-II centers.

Full Program & Abstracts

Table 1. Clinical Outcomes in Adult Trauma Patients with PAAI Stratified by Hospital Type

Outcome	ACS-Level I (n=292)	ACS-Level II (n=86)	p-value
LOS, days, median (IQR)	1.0 (7)	1.0 (7)	0.99
ICU, days, median (IQR)	4.0 (10)	4.5 (8)	0.90
Ventilator, days, median (IQR)	1.0 (4)	1.0 (4)	0.97
Laparotomy for hemorrhage control, n (%)	74 (25.3%)	20 (23.3%)	0.69
Minutes to hemorrhage control, median (IQR)	40.8 (61)	49.2 (82)	0.21
Thoracotomy for hemorrhage control, n (%)	18 (6.2%)	8 (9.3%)	0.31
Minutes to hemorrhage control, median (IQR)	15.0 (25)	10.2 (17)	0.67
Numbers of PRBC units within 4 hours, median (IQR)	14.0 (23)	13.0 (14)	0.89
Complications, n (%)			
Acute kidney injury	16 (5.5%)	4 (4.7%)	0.76
ARDS	10 (3.4%)	3 (3.5%)	0.98
Deep vein thrombosis	7 (2.4%)	3 (3.5%)	0.58
Pulmonary embolism	3 (1.0%)	2 (2.3%)	0.35
Pneumonia/VAP	11 (3.8%)	2 (2.3%)	0.52
Mortality, n (%)	202 (69.2%)	61 (70.9%)	0.76

ACS = American College of Surgeons, LOS = length of stay, IQR = interquartile range, ICU = intensive care unit, PRBC = packed red blood cells, ARDS = acute respiratory distress syndrome, VAP = ventilator associated pneumonia

Full Program & Abstracts

4:56 pm – 5:04 pm

18 (RF)

Use of Thrombolysis in Acute Lower Extremity Ischemia with Known Distal Target Vessel for Revascularization

Nicholas J Gargiulo, III - The Brookdale University Hospital & Medical Center, Mineola, NY

INTRODUCTION AND OBJECTIVES: Thrombolysis is an important therapeutic tool in localizing a distal arterial target vessel in patients presenting with acute lower extremity ischemia. In some patients, however, thrombolysis fails to identify a suitable target vessel for lower extremity bypass often resulting in amputation. Pre-existing knowledge of the distal target vessel may obviate the need for thrombolytic-mediated distal arterial recanalization. We report our five year experience in managing patients with acute lower extremity ischemia with a known distal arterial target vessel without thrombolytic therapy.

METHODS: Over a five year period, 27 patients presented with varying degrees of lower extremity ischemia SVS I (7), SVS II (18), SVS III (2). All patients with emboli were excluded from this experience. Twenty three of 27 patients had acute graft occlusions and the remaining four patients had native arterial occlusions. In 14 of 27 patients, the distal peripheral arterial status was unknown and required thrombolytic therapy. In the other 13 patients, a known distal arterial target vessel was used for successful revascularization without the aid of thrombolysis.

RESULTS: The 14 patients who failed to demonstrate a distal target vessel after thrombolysis ultimately required below-knee or above-knee amputation despite surgical intervention exploring distal arterial target vessels for revascularization. The other 13 patients with a known distal arterial target did not require thrombolysis and underwent successful revascularization. Despite this, 3 of these 13 patients ultimately required amputation between 3 and 6 months.

CONCLUSIONS: Pre-existing knowledge of the distal arterial target vessel obviates the need of thrombolytic therapy in those patients presenting with acute lower extremity ischemia. Additionally, amputation may be avoided in those patients who fail to manifest a distal arterial target after thrombolytic therapy in which the distal arterial target vessel is already known.

Full Program & Abstracts

5:04 pm – 5:12 pm

19 (RF)

Anatomic Variation of the Phrenic Nerve and Brachial Plexus Encountered During 100 Supraclavicular Decompressions for Neurogenic Thoracic Outlet Syndrome with Associated Post-Operative Neurologic Complications

Scott R. Golarz¹, Joseph M. White² - ¹Temple University Hospital, Philadelphia, PA; ²Walter Reed National Military Medical Center, Bethesda, MD

OBJECTIVES: The objective of this study is to characterize phrenic nerve and brachial plexus variation encountered during supraclavicular decompression for neurogenic thoracic outlet syndrome (NTOS) and identify associated post-operative neurologic complications.

METHODS: A multicenter retrospective review was performed to evaluate anatomic variation of the phrenic nerve and brachial plexus from November 2010 to July 2018. After initial characterization, two groups were identified: variant anatomy (VA) group and standard anatomy (SA) group. Complications were analyzed and compared between the two groups.

RESULTS: Supraclavicular decompression for NTOS was completed in 100 patients. Any anatomic variation of the standard course or configuration of the phrenic nerve and, or brachial plexus was encountered in 47 (47%) patients. Phrenic nerve anatomic variations were identified in 28 (28%) patients. These included: 9 duplicated nerves, 6 lateral accessory nerves, 8 medially, and 5 laterally. Brachial plexus anatomic variation was found in 34 (34%) patients. The most common variant configuration of a fused middle and inferior trunk was identified in 25 patients. Combined phrenic nerve and brachial plexus anatomic variation was demonstrated in 15 patients. The VA group and SA groups consisted of 47 and 53 patients, respectively. Transient phrenic nerve injury with post-operative elevation of the ipsilateral hemidiaphragm was documented in 3 patients in the VA group and 6 patients in the SA group ($p=0.49$). Permanent phrenic nerve injury was identified in 1 patient in the VA group ($p=0.47$) and none in the SA group. Transient brachial plexopathy was encountered in 1 patient in the SA group ($p=1.0$) with full recovery to normal function.

CONCLUSIONS: Anatomic variability of the phrenic nerve and brachial plexus are encountered more frequently than previously reported. While the incidence of nerve injury is low, surgeons operating within the thoracic aperture should be familiar with variant anatomy in order to reduce post-operative complications.

Full Program & Abstracts

5:12 pm – 5:24 pm

20

Optimal Timing of Carotid Endarterectomy in Symptomatic Patients

James Andersen, Kristyn Mannoia, Sheela Patel, Sharon Kiang, Christian Bianchi, Theodore H. Teruya, Ahmed Abou-Zamzam, Jr. - Loma Linda University Medical Center, Loma Linda, CA

INTRODUCTION AND OBJECTIVES: Guidelines recommend that patients with carotid artery stenosis >50% (Sx-CAS) undergo carotid endarterectomy (CEA) within 14 days of symptoms. However, perioperative risks, especially stroke, may be increased when CEA is performed within 48 hours. This study seeks out the optimal timing of CEA for Sx-CAS.

METHODS: All CEAs in the Southern California Vascular Outcomes Improvement Collaborative (SoCal VOICe) from 2012-18 were reviewed. Ipsilateral cortical or visual symptoms within 6 months defined Sx-CAS. Timing from symptom occurrence to CEA was classified as immediate (0-2 days), early (3-14 days) or delayed (>14 days). Perioperative stroke, myocardial infarction (MI), and death rates were compared by time to surgery.

RESULTS: Of 2203 CEAs, 436 (20%) were for Sx-CAS (52% stroke, 48% TIA). Mean time from symptoms to CEA was 28.3 days (range 0-172, median 14 days). Sixty-one cases (14%) were immediate, 166 (38%) early and 209 (48%) delayed. Perioperative stroke occurred in 2.8% and stroke/MI/death in 3.7%. Stroke rate was significantly higher in the immediate group (vs. early and delayed): 8.2%, vs. 3.0%, and 0.96%, respectively (P=0.009). Stroke/MI/death was also higher in the immediate group: 11.5%, vs. 4.2%, and 1.0%, respectively (P=0.001). On univariate analysis, immediate surgery was predictive of perioperative events (P=0.009), while age, comorbidities, functional status, Rankin score and ASA class had no impact. Wide variability existed among centers in the timing of CEA (immediate - range 0-50%, delayed - range 41-83%, P=0.01).

CONCLUSIONS: In the SoCal VOICe, 52% of patients undergo CEA within 2 weeks of symptoms. Increased stroke rates occur when CEA is performed within 2 days, while outcomes are improved at 3-14 days and beyond. These data support avoidance of immediate CEA. Opportunity exists to standardize timing of CEA for Sx-CAS among SoCal VOICe participants. Further study is required to define the role of immediate CEA.

Full Program & Abstracts

5:24 pm – 5:36 pm

21

Analysis of Genetic Polymorphism of HLA-DR β 1 Alleles in Mexican Patients with Abdominal Aortic Aneurysms and Possible Associations with Susceptibility or Protection

Javier E. Anaya-Ayala¹, Manuel Garcia-Toca², Susana Hernandez-Dono¹, Monica Escamilla-Tilch³, Jose Marquez-Garcia⁴, Kemberly Hernandez-Sotelo¹, Julio Granados¹, Carlos A. Hinojosa¹ - ¹Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico; ²Stanford University, Palo Alto,CA; ³Centro Medico Nacional 20 de Noviembre, ISSSTE, Mexico; ⁴Instituto Nacional de Enfermedades Respiratorias Ismael Cosío Villegas, Mexico

INTRODUCTION AND OBJECTIVES: The pathogenesis of abdominal aortic aneurysms (AAA) is multifactorial; however previous studies have suggested the role played by autoimmunity, genetic predisposition and ethnic susceptibility. We investigated possible associations of the Class II Human Leucocyte Antigens-DR β 1 (HLA-DR β 1) in Mexican patients with AAA.

METHODS: Case Control Study, HLA molecular typing was completed for DR β 1 loci by Sequence-Specific Oligonucleotide (SSO) in 39 [69% males with a mean age of 72 years, Standard deviation (SD) 9] patients with degenerative AAA that underwent open surgical or endovascular repair and compared with 99 patients without the disease [Control group (CG)] from the same ethnic group. Gene frequencies (gf) were determined, associations were assessed by chi square test at significance level (<0.05), and Odds ratios (OR) were calculated using the STATA v14 Software.

RESULTS: We examined 78 alleles of AAA patients and 198 from CG. When comparing gf, we observed the HLA-DR β 1*01 gf of 0.128 in the AAA compared to 0.05 in the CG (p=0.03 and OR 2.6; 95% CI, 1.01-6.7), the HLA-DR β 1*16 gf were 0.115 in the AAA and 0.025 in CG (p=0.002 and OR 5; 95% CI 1.6-15). Interestingly the HLADR β 1*08 gf were 0.064 in the AAA compared to the 0.165 in the CG showing significant protective effects (p=0.02).

CONCLUSIONS: This analysis confirmed increased frequencies of HLA-DR β 1*01 and HLA-DR β 1*16 alleles and association to the development of AAA in Mexican patients, while the HLA-DR β 1*08 seems to be protective. The understanding of these mechanisms may assist in identifying individuals at genetic risk in different ethnic populations that might benefit from early ultrasound screening and close surveillance.

Full Program & Abstracts

5:36 pm – 5:48 pm

22

Performance of Drug Technology in Patients with Critical Limb Ischemia Treated with Paclitaxel-Eluting Stents and Paclitaxel-Coated Balloons

Matthew Carnevale¹, John Phair², Karan Garg² - ¹Albert Einstein College of Medicine, Bronx, NY; ²Montefiore Medical Center, Bronx, NY

OBJECTIVE: This study evaluated the performance of endovascular paclitaxel drug technology on wound healing in patients with critical limb ischemia (CLI) being treated with either paclitaxel-eluting stents (PES) or paclitaxel-coated balloons (PCB).

METHODS: A retrospective review of all patients with CLI undergoing endovascular revascularization with paclitaxel related technology was carried out, PCB or PES over a 4-year period was performed. The primary endpoint of this study was amputation free survival at 12 months. Secondary endpoints included wound healing and freedom from target lesion revascularization.

RESULTS: A total of 88 limbs were revascularizations in 88 patients. PES was used as the sole drug technology in 56 patients (60.7% male, median age 70.5 years), PCB was used as the sole drug technology in 32 patients (46.9% male, median age 66 years). Limbs were treated for Rutherford stage 5 CLI in 71.6% and stage 6 CLI in 28.4%. After 12 months of follow up, amputation free survival was significantly higher in the PES group compared to the PCB (88.5% vs. 71.1%; $p=0.0443$). Wound healing rates after 1 year were also higher in the PES group (83.9% vs. 59.4%; $p=0.0198$). Freedom from target lesion revascularization was no different between patients treated with PES compared to patients treated with PCB (90.6% vs. 85.7%; $p=0.5185$). Target lesion patency at 12 months in patients treated with PES was significantly than patients treated with PCB (80.4% vs. 58.1%; $p=0.0255$).

CONCLUSION: Amputation free survival was significantly increased in patients treated with PES compared to PCB. The results observed are consistent with previously reported data on paclitaxel. The use of PES for CLI significantly improves overall wound healing compared to PCB as well as previously published data regarding balloon angioplasty and bare metal stenting. Lesions treated with PES have higher patency rates than those treated with PCB.

Full Program & Abstracts

5:48 pm – 6:00 pm

23

Long-Term Proximal Aortic Remodeling Following Thoracic Endovascular Aortic Repair for Blunt Thoracic Aortic Injury

Emily H. Bero, Calvin T. Nguyen-Ho, Brian D. Lewis, William D. Foley, Cheong J. Lee - Medical College of Wisconsin, Milwaukee, WI

INTRODUCTION AND OBJECTIVES: There is limited data assessing long-term consequences of thoracic endovascular aortic repair (TEVAR) in the treatment of blunt thoracic aortic injury (BTAI). Studies have shown significant changes in aortic stiffness with TEVAR. We aim to evaluate aortic remodeling and long-term outcomes following TEVAR for BTAI. We hypothesize that changes in the proximal aorta occur after TEVAR.

METHODS: A retrospective review of patients who underwent TEVAR for BTAI was performed. Between 2004-2018, we identified 32 patients with TEVAR for BTAI who had at least one follow-up with postoperative CTA. Diameter of aortic segments and branches, proximal endograft seal zones, and distal endograft seal zones were measured. Centerline measurement from reformatted 3D CTA was used to assess ascending aorta length, aortic arch length, average aortic curvature, and aortic tortuosity. Device related outcomes such as bird-beaking, mural thrombus, stent migration, and persistent endoleak were also assessed.

RESULTS: The average diameter of the ascending aorta increased significantly following TEVAR (1.5 ± 1.5 , $p < 0.001$ mm). The average diameter of the mid-aortic arch increased significantly (1.3 ± 1.7 mm, $p < 0.001$) and proximal and the distal endograft landing zone diameters increased significantly (1.9 ± 2.1 mm, 2.2 ± 1.6 mm respectively, $p < 0.001$) following TEVAR. Following TEVAR, the ascending aortic length increased significantly (mean 5.7 ± 4.6 mm). There were significant associations between the presence of endograft infolding and the development of endograft mural thrombus ($p < 0.001$) and the need for secondary intervention with the presence of endograft mural thrombus ($p < 0.05$).

CONCLUSIONS: TEVAR for BTAI caused significant geometric changes in the ascending aorta and aortic arch, proximal to the stented aorta. Changes were noted within the stented aortic segment with increased aortic diameters and development of mural thrombus within the endograft. Although clinical significance is yet to be determined, post-TEVAR changes in aortic architecture warrant continued surveillance for better understanding of long-term aortic remodeling.

6:00 pm

VESS MEMBER BUSINESS MTG.

6:15 pm – 7:15 pm

INDUSTRY SPONSORED SYMPOSIUM

Sponsored by: Janssen Pharmaceuticals

XARELTO®: Compass Trial Results for Patients with Chronic CAD/PAD

Brian Ferris, MD

Vascular Surgeon/Clinical Investigator

Medical Director, Lake Washington Vascular Laboratory
(ICAVL Certified)

Chief of Surgery, Overlake Hospital Medical Center

7:00 pm

Free Evening

Full Program & Abstracts

Saturday, February 2, 2019

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
6:55 am – 7:00 am	NEWS AND VIEWS FROM THE SVS Kim Hodgeson, MD President-Elect, SVS
7:00 am – 8:15 am	SCIENTIFIC SESSION III Moderators: Cheong Lee, MD & Ravi Rajani, MD
7:00 am – 7:12 am	24 Disparity in Outcomes after Revascularization for Critical Limb Ischemia Warrants Separate Reporting of Tissue Loss and Rest Pain Anand Brahmandam ¹ , Navid Gholitabar ¹ , Jonathan Cardella ¹ , Naiem Nassiri ¹ , Alan Dardik ¹ , Marc Georgi ² , Cassius Iyad Ochoa Chaar ¹ - ¹ Yale University School of Medicine, New Haven, CT; ² Catalyst Medical Consulting, Simpsonville, SC

INTRODUCTION: Critical Limb Ischemia (CLI) manifests as tissue loss (TL) and rest pain (RP). Outcomes of lower extremity revascularization (LER) for CLI have traditionally been evaluated as a single entity and compared with claudication. We hypothesize that patients presenting with TL have worse short-term outcomes after LER, compared to patients with RP.

METHODS: The National Inpatient Sample (NIS) was reviewed between 2009-2013. All patients undergoing LER for TL and RP were identified. Patient characteristics, Charlson comorbidity index (CCI), length of stay (LOS), rates of inpatient major amputation and mortality after LER were noted. Multivariable regression analysis was performed to identify predictors of inpatient mortality and major amputation between the two groups.

RESULTS: A total of 218,628 patients underwent LER (RP = 76,108, TL = 142,519). Patients in TL were more likely to undergo endovascular LER (RP = 31.3% vs TL = 48.7%; $P < 0.001$). Patients with TL had significantly higher comorbidities (CCI \geq 3: RP = 22.9% vs TL = 40.3%; $P < .001$). (Table) The mean charges were significantly higher in the TL group (RP = \$69,721 vs TL = \$95,985; $P < 0.001$). There was a significantly higher rate of major amputation (RP = 1.3% vs TL = 6.6%; $P < 0.001$) and inpatient mortality (RP = 0.9% vs TL = 1.9%; $P < 0.001$) after LER for TL. On multivariable analysis, TL was independently associated with increased major amputation (OR 4.93; 95% CI 4.18-5.81) and increased mortality (OR-1.42; 95% CI 1.16-1.74) compared to RP.

CONCLUSION: There is significant disparity in outcomes of LER for TL and RP. TL is independently associated with major amputation and inpatient mortality. Outcomes of LER for TL and RP should be reported separately for benchmarking.

Full Program & Abstracts

Table. Patient Characteristics

Patient Characteristics	Rest Pain (n= 76,108)	Tissue Loss (n= 142, 519)	P-Value
Mean Age in years (Lin. SE)	67.7 (0.13)	71.5 (0.10)	0.001
Male (%)	42, 012 (55.2)	80,808 (56.7)	0.002
Female (%)	36,096 (44.8)	61,711 (43.3)	0.002
Race			0.001
<i>White (%)</i>	54,874 (72.1)	97, 483 (68.4)	
<i>Black (%)</i>	13,319 (17.5)	26,081 (18.3)	
<i>Hispanic (%)</i>	4,795 (6.3)	11,687 (8.2)	
<i>Asian or Pacific Islander (%)</i>	609 (0.8)	2,138 (1.5)	
<i>Native American (%)</i>	533 (0.7)	1,140 (0.8)	
<i>Other (%)</i>	2,055 (2.7)	3,991 (2.8)	
Socioeconomic Status (income)			0.001
\$1 - \$38,999 (%)	26,409 (34.7)	45,464 (31.9)	
\$39,000 - \$47,999 (%)	20,549 (27.0)	37,625 (26.4)	
\$48,000 - 62,999 (%)	16,744 (22.0)	32,352 (22.7)	
\$63,000 or more (%)	12,406 (16.3)	27,079 (19.0)	
Diabetes (%)	28,794 (37.8)	78,364 (54.9)	0.001
Hypertension (%)	60,074 (78.9)	115,039 (80.7)	0.004
Smoking (%)	26,672 (35.0)	30,054 (21.1)	0.001
Hyperlipidemia (%)	40,315 (52.9)	66,007 (46.3)	0.001
Coronary Artery Disease (%)	35,882 (47.1)	69,236 (48.5)	0.012
Congestive Heart Failure (%)	8,566 (11.2)	31,072 (21.8)	0.001
Chronic Kidney Disease (%)	12,610 (16.5)	48,186 (33.8)	0.001
Chronic Pulmonary Disease (%)	22,089 (29.0)	33,275 (23.3)	0.001
Obesity (%)	5,230 (6.8)	10,765 (7.5)	0.012

Full Program & Abstracts

CCI ≥ 3 (%)	17,494 (22.9%)	57,468 (40.3%)	0.001
CCI 0-2 (%)	58,614 (77.0)	85,051 (59.7)	
Mean CCI (Lin. SE)	1.6 (0.02)	2.3 (0.01)	0.001
Revascularization			
<i>Open (%)</i>	52,259 (68.7)	73,105 (51.3)	0.001
<i>Endovascular (%)</i>	23,850 (31.3)	69,414 (48.7)	0.001
Outcomes			
<i>Inpatient Mortality (%)</i>	733 (0.9)	2,673 (1.9)	0.001
<i>Inpatient Major Amputation (%)</i>	1042 (1.4)	9,425 (6.6)	0.001
Mean Hospital Charges (Lin. SE)	\$69,721.4 (\$1,145.2)	\$95,984.9 (\$1,498.9)	0.001
Mean LOS in days (Lin. SE)	4.9 (0.07)	8.5 (0.08)	0.001

Full Program & Abstracts

7:12 am – 7:24 am

25

Operative Complexity and Prior Endovascular Intervention Negatively Impact Morbidity after Aortobifemoral Bypass in the Modern Era

Charles Decarlo, Laura Boitano, Emel Ergul, Samuel I. Schwartz, Robert T. Lancaster, Mark F. Conrad, Matthew J. Eagleton, W. Darrin Clouse - Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Endovascular therapy is first-line treatment for aortoiliac occlusive disease. This shift has altered case volume, patient selection, and risk profile for aortobifemoral bypass (ABF). Given this, we sought to investigate factors influencing morbidity and mortality after ABF in the endovascular era.

METHODS: Data for patients undergoing primary ABF from 2000 to 2017 was queried. Primary endpoints included major complication (unplanned return to OR, life-or-limb-threatening complications, and 30-day readmission or death) and long-term survival. Logistic regression and cox proportional hazards determined predictors of primary endpoints. Kaplan-Meier analysis estimated long-term survival.

RESULTS: During this 17-years, 256 patients underwent primary ABF. Mean age was 67.9 ± 10.6 years and 51.2% were women. Most had claudication (69.5%); 28.9% had critical ischemia. Sixty-five (25.4%) patients had prior aortoiliac endovascular intervention, 106 (41.4%) required aortic cuff endarterectomy, 111 (43.3%) femoral outflow adjunct, 9 (3.5%) simultaneous lower extremity bypass, and 230 (89.8%) had TASC D lesions. Concomitant renovisceral revascularization was needed in 42 (16.4%) patients. Thirty-day mortality was 2.7%. Major complication occurred in 92 patients (35.9%). Predictors included prior endovascular intervention (OR-2.2,95%CI, 1.2-4.1;p=0.01), malignancy (OR-2.6,1.3-5.3;p=0.01), intraoperative complication (OR-3.3,1.3-9.2;p=0.03), operative blood loss, (OR-1.0/100ml,1.0-1.0 ;p=0.03), and cuff endarterectomy (OR-1.8,1.0-3.1;p=0.04). Median follow-up was 5.3 years (interquartile range: 7.2 years). Survival at 1, 3, and 5-years was 94%, 90%, and 82%, respectively. Primary-patency and freedom from reintervention at 5-years were 76% and 79%, respectively. Predictors of late mortality included malignancy (HR-2.3, 95%CI, 1.3-3.9;p<0.01), COPD (HR-1.8, 1.1-3.1;p=0.02), CHF (HR-2.3, 1.2-4.3;p=0.01), Rutherford's class (HR-1.5, 1.1-2.1;p=0.01), operative blood loss (HR-1.0/100ml, 1.0-1.0;p=0.04) and CKD (HR-2.3, 1.2-4.2;p=0.01).

CONCLUSIONS: Although late outcomes after ABF in the contemporary era remain acceptable, major complications are frequent. Operative complexity and prior endovascular revascularization predict complications. Long-term survival is driven by degree of limb-ischemia and comorbidities. These should be considered in selection for ABF, potentially modifying approach to improve outcomes.

Full Program & Abstracts

7:24 am – 7:36 am

26

Obesity Should not Prevent Radiofrequency Ablation in C2 and C3 Venous Disease Patients

Peng Zhao, Mark D Balceniuk, Isabelle Chu, Luke Cybulski, Adam J. Doyle - University of Rochester Medical Center, Rochester, NY

BACKGROUND: Patients with higher clinical CEAP score (cCEAP) require treatment given skin damage, whereas treating patients with lower cCEAP is debatable. Obesity is a risk factor for progression to chronic venous insufficiency and it is often cited for increased peri-procedural risks in surgery. The objective of the study is to compare patient-reported outcomes between obese and non-obese patients with C2 and C3 disease after radiofrequency ablation (RFA).

METHODS: 418 patients (559 limbs) with C2 and C3 disease who underwent RFA were evaluated. Patients were grouped into obese and non-obese cohorts. Patient-reported symptoms were obtained from the Venous Health Questionnaire (VHQ) during initial clinic visit and at follow-up. Outcomes were compared within each cohort and between both cohorts.

RESULTS: There were 209 non-obese patients (271 limbs) and 219 obese patients (288 limbs). There were significant differences in preprocedural symptoms between groups of leg swelling, achiness, complaints of appearance. Leg swelling continued to be significantly different between groups post-intervention, but the other symptoms were not. Each cohort independently showed significant improvement in symptoms and cCEAP after RFA (Table). When comparing the two groups using Cumulative Link Mixed Model, no significant difference was found in any of the patient-reported symptom between the groups to suggest one group benefited more than the other from the procedure. In addition, the incidence of complication was not significantly different between groups ($p=0.202$).

CONCLUSIONS: This is the first study to compare patient-reported outcomes in obese and non-obese patient with cCEAP after RFA. Both patient groups had significant improvements in symptoms and cCEAP without added complication. Therefore, obesity alone should not be a barrier to RFA for patients with C2 and C3 venous disease.

Full Program & Abstracts

Table. Between-Group Comparison of Symptoms and cCEAP; In-Group Comparison of Change in cCEAP and Symptoms

	Baseline cCEA and symptoms score			Followup cCEAP and symptoms score			In-group comparison of score changes	
	Non-obese, n=271, Mean (SE)	Obese, n=288, Mean (SE)	p Value	Non-obese, n=271, Mean (SE)	Obese, n=288, Mean (SE)	p Value	Non-obese, n=271, p value	Obese, n=288, p value
cCEAP	2.45 (0.03)	2.65 (0.03)	<0.001	2.18 (0.04)	2.51 (0.05)	<0.001	<0.001	<0.001
Heaviness	1.77 (0.09)	1.89 (0.09)	0.384	0.838 (0.069)	1.01 (0.07)	0.13	<0.001	<0.001
Achiness	2.10 (0.09)	2.41 (0.09)	0.016	1.24 (0.07)	1.39 (0.08)	0.238	<0.001	<0.001
Swelling	1.52 (0.09)	2.05 (0.10)	<0.001	0.657 (0.067)	0.976 (0.076)	<0.001	<0.001	<0.001
Throbbing	1.54 (0.09)	1.76 (0.09)	0.167	0.664 (0.063)	0.753 (0.063)	0.334	<0.001	<0.001
Itching	1.07 (0.08)	1.17 (0.08)	0.436	0.598 (0.058)	0.715 (0.062)	0.234	<0.001	<0.001
Appearance	2.72 (0.07)	2.40 (0.08)	<0.001	1.57 (0.07)	1.47 (0.07)	0.162	<0.001	<0.001
Impact on work/activity	1.27 (0.07)	1.30 (0.07)	0.609	0.749 (0.064)	0.813 (0.064)	0.372	<0.001	<0.001

Full Program & Abstracts

7:36 am – 7:48 am

27

Clinical Practice Patterns and Bias in Randomized Trials: A Survey of Investigators in the BEST-CLI Trial

Alik Farber¹, Matthew Menard², Susan Assmann³, Mazen S. Albaghdadi⁴, Michael N. Young⁴, Maria F. Villarreal¹, Sandra Siami³, George Sopko⁵, Diane Reid⁵, Michael Strong², Kenneth Rosenfield⁴ - ¹Boston Medical Center, Boston, MA; ²Brigham and Women's Hospital, Boston, MA; ³New England Research Institutes, Inc. (NERI), Watertown, MA; ⁴Massachusetts General Hospital, Boston, MA; ⁵National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health (NIH), Bethesda, MD

INTRODUCTION: Bias often confounds interpretation of research trial results. Best Endovascular versus Best Surgical Therapy for Patients with Critical Limb Ischemia (BEST-CLI) is a randomized trial comparing surgical and endovascular revascularization strategy in patients with CLI. Because blinding of treatment strategy is not feasible, differential collection of data between the open and endovascular arms can lead to ascertainment bias. We assessed the degree of this bias related to the BEST-CLI trial.

METHODS: A cross-sectional electronic survey was carried out to evaluate investigator demographics, self-reported primary specialty, geographic location, volume of CLI cases, and institutional practice patterns with respect to pre- and post-procedure cardiac testing.

RESULTS: The survey was sent to 932 BEST-CLI investigators; 183 (20%) completed the survey, including 140 (77%) vascular surgeons and 43 (23%) non-surgeon interventionalists. A cardiac evaluation protocol was routinely followed by 65% and 32% of investigators before open and endovascular revascularization, respectively ($p < 0.0001$). Cardiac stress testing was more commonly ordered in the open surgery group (median 50% of patients vs 5%, $p < 0.0001$). Post-procedural protocols to assess for cardiac complications were used by 29% and 21% of investigators after open and endovascular revascularization, respectively ($p = 0.0004$). ECG and troponins were more likely to be ordered after open than endovascular surgery ($P < 0.0001$). Vascular surgeons were more likely to order evaluation for ECG changes, heart failure, and arrhythmia than non-surgical interventionalists (94% vs. 84%; $p = 0.0499$, 96% vs. 81%, $p = 0.01$; 89% vs. 72%, $p = 0.01$, respectively.)

CONCLUSIONS: BEST-CLI Investigators evaluate for presence of cardiac disease before and after intervention differently based on whether the patient is undergoing open or endovascular revascularization. This ascertainment bias can influence the detection of cardiac complications in this patient population and thus may influence reported outcomes.

Full Program & Abstracts

7:48 am – 7:56 am

28 (RF)

Long-Term Quality of Life Comparison Between Supra and Infraclavicular Rib Resection in Patients with vTOS

Anahita Dua, Kara Rothenberg, Jason T. Lee - Stanford University, Menlo Park, CA

INTRODUCTION AND OBJECTIVES: Rib resection in venous thoracic outlet syndrome (VTOS) may be approached via a transaxillary, supraclavicular, or infraclavicular approach based on surgeon preference. This study aimed to compare long term quality of life outcomes in vTOS patients managed with a supraclavicular versus infraclavicular rib resection.

METHODS: All patients with vTOS undergoing rib resection at a single institution were retrospectively reviewed. In 2012 we switched our approach to infraclavicular. Clinical records and imaging results were tabulated. Postoperative outcomes, complications, and long term symptom follow up via QuickDASH surveys were reported. The QuickDASH score ranges from 0-100 with lower numbers indicating better functional status (100 = worst).

RESULTS: Over the 19-year study period we performed 109 rib resections in patients with vTOS (mean age 29.8 years). From 2000 to 2012, 54 patients were approached via a supraclavicular approach and from 2012-2018, 55 patients were approached via an infraclavicular approach. There was a significant decrease in the number of complications in the infraclavicular cohort compared to the supraclavicular group. There was no difference in long term QuickDASH scores (Table 1).

CONCLUSIONS: The infraclavicular approach in vTOS patients is associated with a lower rate of complications while maintaining excellent long-term quality of life outcomes.

Table 1.

	Supraclavicular (n=54)	Infraclavicular (n=55)	
Average Age	29.6	30.5	
Complications			
Pneumothorax	6	4	
Hemothorax	1	0	
Lymphocele	5	0	
Long thoracic nerve injury	1	0	
Total	13 (24.1%)	4 (7.2%)	P<0.05
Average follow up	5.8 years	4.0 years	
QuickDASH score	3.9	3.34	

Full Program & Abstracts

7:56 am – 8:04 am

29 (RF)

Temporal Trends and Hospital Charges Associated with an Endovascular Approach for Acute Limb Ischemia

Courtenay M. Holscher, Joseph K. Canner, Jacqueline M. Garonzik Wang, Christopher J. Abularrage, James H. Black, III, Caitlin W. Hicks - Johns Hopkins University, Baltimore, MD

INTRODUCTION/OBJECTIVES: Recent studies suggest similar perioperative outcomes for endovascular and open surgical management of acute limb ischemia (ALI). We sought to describe temporal trends, patient factors, and hospital charges associated with contemporary ALI management.

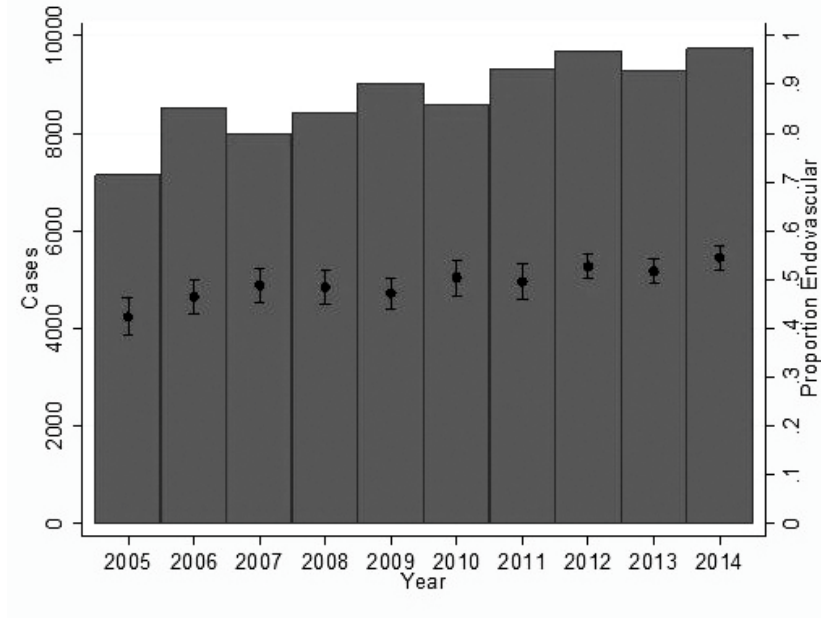
METHODS: We used the weighted National Inpatient Sample to estimate primary ALI cases requiring open or endovascular intervention(2005-2014). We used various multivariable regression models with an interaction term for calendar year to examine patient factors, length of stay(LOS), and risk-adjusted total hospital charges associated with an endo-first vs. open-first intervention.

RESULTS: Among 87,725 ALI cases, 49.4% had an endo-first approach. Both the number and proportion of cases with an endo-first approach increased over time ($P<0.001$; Figure 1). Independent predictors of endo-first management included younger age, male sex, renal insufficiency, tobacco use, and more recent admission ($P\leq 0.02$). Patients who underwent fasciotomy, those with Medicaid, and those admitted on a weekend were more likely to receive open-first management($P\leq 0.02$). LOS was shorter with endo-first approach (7.3 ± 0.1 vs. 8.3 ± 0.1 days, $P<0.001$). Total risk-adjusted hospital charges increased over time with both approaches, but the increase was more dramatic in the endo-first group (interaction $P<0.001$; Figure 2). In the open-first group, total charges increased by \$4,304/year (95%CI \$2,688-\$5,920), while in the endo-first group, total charges increased by \$9,239/year (95%CI \$4,900-\$13,578).

CONCLUSION: An endovascular-first approach to ALI has significantly increased over time. Despite a shorter LOS, this approach is more costly and charges are increasing more quickly with time than for open surgery. The cost effectiveness of endovascular ALI management warrants further investigation.

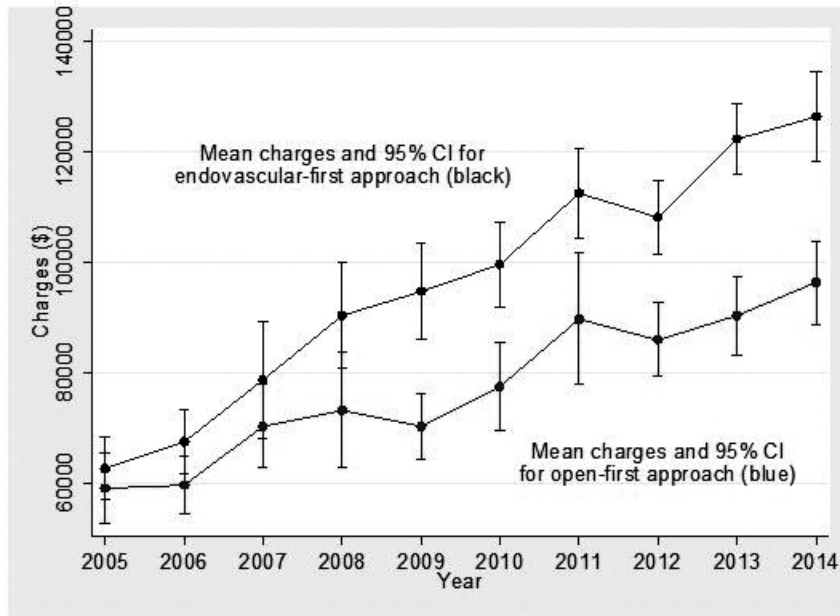
Full Program & Abstracts

Figure 1. Increase in Both the Number and Proportion of ALI Cases Undergoing an Endovascular-First Approach Over Time. Mean and 95% Confidence Interval of Proportion Endovascular Shown.



Full Program & Abstracts

Figure 2. Increase in Hospital Charges for Endovascular-First and Open-First Approach to ALI Over Time. Means and 95% Confidence Intervals (CI) Shown.



Full Program & Abstracts

8:04 am – 8:12 am

30 (RF)

Influence of Suprarenal Fixation on Perioperative Renal Outcomes after EVAR: Keep the Function you Still Have

Jaime Benarroch-Gampel, Christopher R. Ramos, Amit Pujari, Yazan Duwayri, Ravi R. Rajani, William D. Jordan, Jr., Robert S. Crawford - Emory University, Atlanta, GA

OBJECTIVE: To compare outcomes in patients with normal, moderate and severe chronic kidney disease undergoing endovascular abdominal aortic aneurysm repair (EVAR) using devices with and without suprarenal fixation.

METHODS: Patients with normal (GFR \geq 60 mL/min/1.73m²), moderate (GFR=30–59 mL/min/1.73m²) or severe (GFR<30 mL/min/1.73m²) kidney disease who underwent EVAR (N=5,534) were identified from the ACS-NSQIP targeted database (2011-2015). Groups were determined by the presence (Cook Zenith® or Medtronic Endurant®) or absence (Gore Excluder®) of a suprarenal fixation system. Postoperative renal complications defined as: 1) rise in baseline creatinine of >2mg without dialysis or 2) new dialysis requirements, were analyzed with results stratified by degree of kidney disease.

RESULTS: A total of 3,225 (58.3%) patients underwent EVAR using a device with a suprarenal fixation system. Patients undergoing EVAR with suprarenal fixation system were less commonly used in symptomatic patients (11 vs. 13.7%; P=.002) as well as for ruptured AAA patients (4.5% vs. 6%; P=0.01). There was no difference in baseline kidney function between groups. EVAR with suprarenal fixation was associated with more renal complications (1.40% vs. 0.65%; P=.008). In subgroup analysis, patients with moderate kidney dysfunction (n=1,780) had more renal complication rates (2.2% vs. 0.8%; P=.02) with suprarenal fixation systems. No differences were seen in patients with normal (0.4% vs. 0.2%; P=.32; n=3,597) or severe (14.3% vs. 10.2%; P=.45; n=157) kidney dysfunction. This difference was driven mostly by postoperative elevation on baseline creatinine (0.6% vs. 0.2%; P=.03) without requirements for new dialysis (0.8% vs. 0.4%, P=.08). After adjustments with multivariate logistic regression models, EVAR with suprarenal fixation was associated with more renal complications (OR=2.65; 95%CI=1.32–5.34).

CONCLUSION: EVAR with suprarenal fixation devices are associated with more postoperative renal complications in patients with moderate kidney dysfunction. Long-term evaluation of this subgroup of patients undergoing EVAR should be considered.

8:15 am – 8:45 am

AWARD SESSION

Moderators: Jonathan Eliason, MD & Karen Woo, MD

Update from 2018 Winner(s)

- Travel Award
- Resident Research Award
- Early Career Faculty Award

2019 Award Winners

- Medtronic Vascular Resident Research Award
- VESS Early Career Faculty Research Award

8:50 am – 9:00 am

Introduction of the President

James Black, MD

9:00 am – 9:45 am

PRESIDENTIAL ADDRESS

Jonathan Eliason, MD

Full Program & Abstracts

10:00 am - 12:00 pm	ROUND TABLE DISCUSSIONS (Optional Programming) Building Your Brand as a Young Surgeon <i>See page 9 for more information</i>
3:00 pm	Registration Re-Opens
3:30 pm – 4:00 pm	Coffee Break
4:00 pm – 6:00 pm	SCIENTIFIC SESSION IV Moderators: Mark Conrad, MD & Matthew Corriere, MD
4:00 pm – 4:12 pm	31 Contemporary Outcomes of Peripheral Bypass Compared to Amputation in Octogenarians Cheryl Richie, Daniel Davenport, Nathan T. Orr - University of Kentucky, Lexington, KY

INTRODUCTION AND OBJECTIVES: Chronic limb threatening ischemia (CLTI) in octogenarians presents unique treatment challenges in patients with multiple comorbidities and variable functional status. Endovascular interventions offer a better risk profile; however, this is not always a feasible option for anatomic or disease specific reasons. This study compares outcomes of peripheral bypass versus amputation in octogenarians.

METHODS: The ACS-NSQIP database was queried from 2013 to 2016 for patients >80 years-old undergoing femoral-popliteal (FPB), femoral-tibial (FTB), or popliteal-tibial (PTB) bypass with vein or prosthetic graft versus above-knee (AKA) or below-knee amputation (BKA). Patients presenting with SIRS, sepsis, septic shock, or a leukocytosis > 11,000 were excluded. Patient demographics, risk factors, and 30-day unadjusted outcomes were analyzed. Multivariate regression analysis was then performed to compare risk adjusted 30-day morbidity and mortality.

RESULTS: The bypass group contained 2226 patients compared to 1253 patients in the amputation group. AKA represented 59.9% of the amputation group. The largest portion of bypasses were FPBs at 58.6%. Total pre-op functional dependence was 1.3% for bypass versus 18.2% for amputation (p-value, <0.01). Risk factors for amputation over bypass included age, minority race, ASA class IV-V, diabetes, CHF, dialysis, preoperative open wound, facility of origin, and functional dependence. Unadjusted 30-day mortality was 3.6% for bypasses and 7.7% for amputations (p-value, <0.01), with an in-hospital mortality of 2.0% v. 3.2% and a mortality after discharge of 1.6% v. 4.5%, respectively (p-value <0.01). Unadjusted morbidity was not significantly different between the two groups (18.7% bypass v. 17.8% amputation, p-value, 0.52). After multivariate risk adjustment, there was no statistically significant difference in mortality or morbidity between the groups.

CONCLUSIONS: Contemporary risk-adjusted 30-day morbidity and mortality for bypass versus amputation in octogenarians shows no significant difference. This data demonstrates that aggressive surgical limb salvage can be safe in well-selected patients in this age group.

Full Program & Abstracts

4:12 pm – 4:24 pm

32

Renal Artery Coverage During EVAR for Ruptured AAA

Adam Taniou¹, Laura T. Boitano¹, Linda J. Wang¹, Murray L. Shames², Jason T. Lee³, Mathew J. Eagleton¹, W. Darrin Clouse¹, Mark F. Conrad¹ - ¹Massachusetts General Hospital, Boston, MA; ²University of South Florida, Tampa, FL; ³Stanford University, Stanford, CA

INTRODUCTION: Coverage of one or both renal arteries may be required to facilitate endovascular repair (EVAR) in patients who are not candidates for open surgery in ruptured abdominal aortic aneurysms (rAAA). We sought to understand the consequences of renal coverage during these emergent procedures.

METHODS: Utilizing the VQI dataset from 2013–present, we selected patients who had undergone EVAR for rAAA. Patients were distinguished by whether they had none, unilateral, or bilateral renal artery coverage. Patients were excluded if they were previously on dialysis or had an intervention to preserve renal perfusion. Primary endpoints included in-hospital mortality, composite permanent-dialysis/30-day-death, and 1-year survival.

RESULTS: Overall there were 2278 patients presenting with ruptured aneurysms. Table 1 shows the breakdown of these patients and outcome variables. On multivariate regression, bilateral renal coverage was associated with increased odds of in-hospital mortality (OR=5.7, +/-4; p=.030) permanent-dialysis/30-day-death (OR=8.6, +/-7; p=.016), and permanent dialysis (OR=7.2, +/-7; p=.049). Two patients with bilateral renal coverage did not suffer permanent-dialysis/death. Single renal artery coverage significantly increased the odds of any post-operative complication (OR=2.8, +/-1; p=.046), post-operative respiratory failure (OR=4.8, +/-3; p=.003), permanent-dialysis (OR=5.2, +/-4; p=.035), but not in-hospital mortality. Unadjusted Kaplan Meier one-year survival estimates were significantly lower with bilateral renal coverage (HR=3.4, p=.0002). Bilateral coverage remained a significant predictor on adjusted analysis (HR=3.5, p=0.002), however single renal coverage did not significantly affect survival in unadjusted or adjusted models.

CONCLUSION: Bilateral renal coverage in rAAA significantly increases in-hospital mortality, lowers survival, and increases the risk of permanent-dialysis/death. While single renal artery coverage increases the risk of permanent dialysis, respiratory failure, and any complication, it does not significantly affect in-hospital mortality or one-year survival.

Full Program & Abstracts

Table 1. Outcomes Based on Renal Coverage in Ruptured AAA

Variable	No Renal Coverage	Single Renal Coverage	Bilateral Renal Coverage	p-Value
Number of Patients	2,230	30	18	
In-Hospital Mortality	482 (22%)	7 (23%)	13 (72%)	< .001
Mean Survival	780 Days (+/- 17)	422 days (+/- 83)	219 Days (+/- 99)	.005
Post-Op Permanent Dialysis/ 30-Day Death	513 (23%)	12 (40%)	16 (89%)	< .001
Length of Stay	9.4 days	11.9 days	3.6	.360
Post-Op Permanent Dialysis	58 (3%)	5 (17%)	5 (31%)	< .001
Post-Op Myocardial Infarction	106 (5%)	1 (3%)	1 (6%)	.924
Post-Op Respiratory Failure	336 (15%)	8 (27%)	2 (11%)	.190
Post-Op Complication	492 (37%)	19 (63%)	12 (75%)	< .001

Full Program & Abstracts

4:24 pm – 4:36 pm

33

The Reintervention Index a New Measure for Comparative Effectiveness of Lower Extremity Revascularization

Cassius Iyad Ochoa Chaar, Navid Gholitabar, Mara DeTrani, Saman Doroodgar, Haoran Zhuo, Yawei Zhang, Alan Dardik
- Yale University, New Haven, CT

INTRODUCTION AND OBJECTIVES: Reinterventions after lower extremity revascularization (LER) are common. Current outcome measures for durability rely on freedom from reintervention but cannot assess the extent of repeated LER. The aim of this study is to compare the reintervention index, defined as the mean number of repeat LER, after open and endovascular revascularization.

METHODS: A retrospective review of the charts of consecutive patients undergoing LER for peripheral artery disease (PAD) in 2013-2014 by multiple providers in a tertiary care center was performed. Patients were divided into open and endovascular groups based on the first LER procedure performed during the study period. Patient characteristics and outcomes were compared between the 2 groups. Multivariable regression was performed to determine factors associated with reintervention.

RESULTS: There were 367 patients (Endo = 316, Open = 51). A total of 211 patients underwent 523 reinterventions (reintervention rate = 57.5%, reintervention index = 2.47 ± 2.02 procedures [Range 1-12]). Patients in the open group were more likely to be smokers ($P=0.018$), and to have prior open LER ($P=0.003$) while patients in the endovascular group were older ($P<0.001$) and more likely to have cardiovascular comorbidities. On follow up, there was no difference in overall or ipsilateral reintervention rates or reintervention indices between endovascular and open LER. (Table) Major amputation was significantly higher after open LER (19.61% vs 8.54%, $P=0.013$) but there was no difference in survival ($P=0.448$). Multivariable analysis did not show a significant relation between type of procedure and reintervention.

CONCLUSIONS: The reintervention index is a measure to assess the extent of repeated LER. Patients with PAD are afflicted with similar extent of reinterventions after open and endovascular LER.

Full Program & Abstracts

Table. Characteristics and Outcomes of Patients Undergoing Open and Endo LER

Characteristics	Endovascular 100% (N=316)	Open 100% (N=51)	P
Demographics			
Age (mean ± SD)	68.97 ± 11.68	62.59 ± 11.33	<0.001*
Male	61.71 (195)	60.78 (31)	0.90
Race			0.477
White	65.40 (206)	56.86 (29)	
African American	22.54 (71)	29.41 (15)	
Other	12.06 (38)	13.73 (7)	
Body Mass Index (BMI)	29.06 ± 6.79	26.51 ± 4.10	<0.001*
Comorbidities			
Diabetes	62.34 (197)	39.22 (20)	0.002*
Hypertension	90.19 (285)	76.47 (39)	0.005*
Hyperlipidemia	69.84 (220)	47.06 (24)	0.001*
Coronary Artery Disease (CAD)	54.60 (172)	39.22 (20)	0.041*
Congestive Heart Failure (CHF)	18.99 (60)	9.80 (5)	0.111
Stroke	10.79 (34)	7.84 (4)	0.629
Chronic Renal Insufficiency	21.66 (68)	19.61 (10)	0.741
End Stage Renal Disease (ESRD)	9.49 (30)	3.92 (2)	0.284
Smoking			0.018*
Former	47.78 (151)	43.14 (22)	
Current	29.43 (93)	47.06 (24)	
No Smoking	22.78 (72)	9.80 (5)	
Hypercoagulable Disorder	0.63 (2)	0.00 (0)	1.00
History of Cancer	16.77 (53)	15.69 (8)	0.847
Prior Endovascular Procedure	20.25 (64)	21.57 (11)	0.829
Prior Open Procedure	11.71 (37)	27.45 (14)	0.003*
Any Prior LER (Endo or open)	28.48 (90)	41.18 (21)	0.067
Indication			0.683
Claudication	51.11 (161)	48.08 (25)	
Critical limb ischemia	48.89 (154)	51.92 (27)	
Long-Term Outcomes			
Follow-up time (mean years ± SD)	2.69 ± 1.46	2.72 ± 1.46	0.912
Overall Reintervention Rate (either leg)	59.18 (187)	47.06 (24)	0.104
Overall Reintervention Index (mean interventions ± SD)	2.41 ± 1.96	3.00 ± 2.47	0.18
Ipsilateral Reintervention Rate	41.46 (131)	37.25 (19)	0.571
Ipsilateral Reintervention Index (mean interventions ± SD)	1.92 ± 1.61	2.21 ± 1.40	0.463
Major Amputations	8.54 (27)	19.61 (10)	0.013
Mortality	26.58 (84)	21.57 (11)	0.448

Full Program & Abstracts

4:36 pm – 4:48 pm

34

Timing of Minor Amputation Following Lower Extremity Revascularization Impacts Healing Outcomes

Tia Sutton¹, Sanya Lulla², Sean Nassoioy², Carlos Bechara², Paul Crisostomo², Pegge Halandras², Michael Soult², Bernadette Aulivola²-¹Loyola University Chicago Stritch School of Medicine, Maywood, IL; ²Loyola University Medical Center, Maywood, IL

INTRODUCTION AND OBJECTIVES: Efforts at limb salvage in patients with critical limb ischemia (CLI) often involve surgical or endovascular revascularization and foot debridement or minor amputation. Minor amputations have high rates of wound-healing complications and need for additional debridement or re-amputation. Many studies have identified risk factors for non-healing, however none have examined the impact of timing of minor amputation following revascularization. This study aims to identify if timing of minor amputation after revascularization impacts wound healing outcomes.

METHODS: A single academic medical center database was queried from 2006-2016. All patients undergoing infrainguinal lower extremity revascularization and subsequent minor amputation within 1 year were identified, including toe, ray, transmetatarsal, Lisfranc, Chopart's and Syme's amputations. Trauma patients, those lost to follow-up or expired prior to complete wound healing were excluded. Primary outcomes are complete wound healing without need for re-amputation and time to wound healing.

RESULTS: 116 limbs were identified and met inclusion criteria. 72.4% of patients were male. 56(48%) were diabetic and 42(36.2%) had end-stage renal disease. Mean age was 73.8 +/- 11.7 years. Mean time between revascularization and minor amputation was 22.3 days. 58(50%) limbs healed without need for re-amputation, 58(50%) did not heal primarily and required more proximal minor or major amputation. Mean time between revascularization and minor amputation in the group that healed was 21.6 days, and 31.9 days in the group that did not heal (p = 0.19). Mean time to complete wound healing was 133.9 days (range 14-734 days), with shorter time from revascularization to minor amputation associated with shorter time to complete wound healing (p = 4.99 x10⁻⁷).

CONCLUSIONS: Timing of minor amputations after revascularization does not impact the likelihood of wound healing but does impact time to complete healing among wounds that healed, favoring amputation soon after revascularization.

Full Program & Abstracts

4:48 pm – 4:56 pm

35 (RF)

Lower Socioeconomic Status is Associated with Groin Wound Complications Following Revascularization for Peripheral Artery Disease

Saagar C. Bakshi, Amanda Fobare, Jaime Benarroch-Gampel, Victoria Teodorescu, Ravi R. Rajani - Emory University, Atlanta, GA

INTRODUCTION: Surgical site infections (SSIs) following lower extremity revascularization are a common cause of increased morbidity in patients with peripheral arterial disease. Understanding the multifaceted risk factors for SSIs may suggest closer monitoring for certain patients. The objective of this study is to evaluate the risk factors associated with incidence of SSIs.

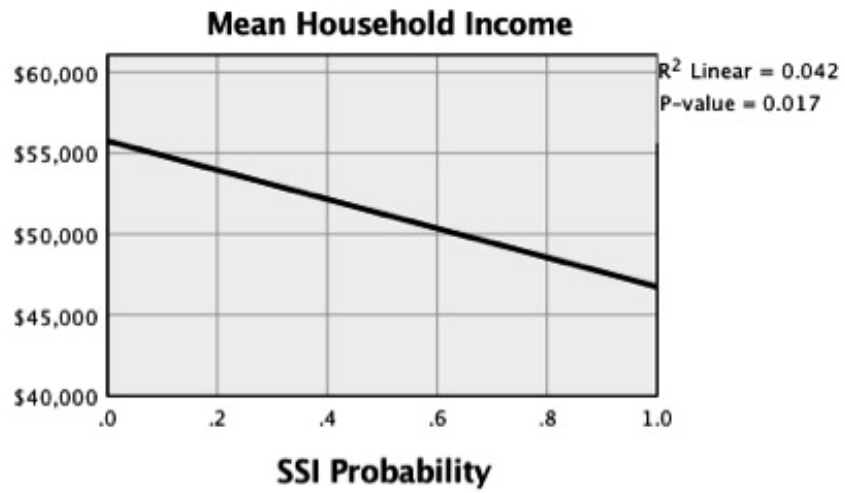
METHODS: A retrospective review of a prospectively maintained database was queried for patients who underwent femoral exposure to treat peripheral artery disease from 2014-2017 at a single, academic, public hospital. Demographics and procedural data were collected from chart review, while zip code geo-coding was used to obtain surrogates for various socioeconomic factors. The primary outcome measure was SSI within 90 days of operation.

RESULTS: 136 total patients were identified, of which 19 (14%) developed an SSI. The only demographic variable associated with risk of infection was BMI (24.8 vs 30.1, $p<0.05$). Major preoperative comorbid conditions, smoking status, and insurance status were not associated with risk of complications. Additionally, the type of procedure performed was not associated with SSI risk. Estimated blood loss (292 vs 463mL, $p<0.05$), post-operative glucose (169 vs 212, $p<0.05$), and post-operative white blood cell count (13.6 vs 18.3, $p<0.05$) were the only peri-procedural variables associated with SSI. Lower mean household income, mean family income, and per capita income were associated with an increased risk of post-operative infection (all $p<0.05$).

CONCLUSION: Socioeconomic factors, including household income, are strongly associated with risk of SSI following lower extremity revascularization. Modifiable variables, such as preoperative optimization and procedural conduct had a smaller effect on SSI development. Models describing complications and readmission rates following vascular surgery must account for differing levels of access to healthcare.

Full Program & Abstracts

Figure.



Full Program & Abstracts

4:56 pm – 5:04 pm

36 (RF)

Utilization and Outcomes of Radial Artery Access for Lower Extremity Endovascular Intervention

Abhisekh Mohapatra, Zein M. Saadeddin, Efthymios D. Avgerinos, Georges E. Al-Khoury, Eric S. Hager, Mohammad H. Eslami - University of Pittsburgh Medical Center, Pittsburgh, PA

INTRODUCTION AND OBJECTIVES: Radial artery access has become popular for cardiac interventions, but its role in lower extremity interventions is not well defined. We aimed to describe current utilization and outcomes of transradial access for lower extremity interventions.

METHODS: Peripheral vascular intervention (PVI) from 2016-2018 where transradial access was employed in the Vascular Quality Initiative (VQI) registry were studied. Cases before 2016 were excluded as documentation of transradial access was not possible in earlier years. PVIs involving radial artery access were evaluated with regard to access guidance, access-site complications, target vessels treated and the technical success of these interventions.

RESULTS: Of 67,537 PVIs, 173 (0.27%) involved radial access. Utilization varied significantly by region ($P < 0.001$). The right radial artery was used in 47% of cases. Ultrasound-guided access was documented in 50% of these cases. There were no significant differences in age, weight, body mass index, or gender between the transradial group and other PVIs. In 105 procedures (61%), a second access site was utilized, most commonly a retrograde (65 cases; 62%) or antegrade femoral access (16 cases; 15%). The largest sheath was 6-Fr in 64%; only 5 cases utilized a 7- or 8-Fr sheath. Interventions documenting radial-only access more commonly treated the aortoiliac segment (68% vs. 31%, $P < 0.001$) and less commonly treated the femoropopliteal (43% vs. 64%, $P < 0.001$) and tibial segments (5.9% vs. 29%, $P < 0.001$). Technical success was 98%, with four lesions (three common iliac arteries, one superficial femoral artery) unable to be crossed. There were three (1.7%) access-site complications; all were hematomas, all involved a 6-Fr sheath, and one required surgical intervention.

CONCLUSIONS: Radial access is associated with high technical success rates and low access-site complication rates. Advances in device profile and shaft length may overcome shortcomings of transradial access and lead to further utilization of this access site.

Full Program & Abstracts

5:04 pm – 5:12 pm

37 (RF)

Bilateral Iliac Vein Stenting Reduces Great and Small Saphenous Venous Reflux

Jesse Chait, Pavel Kibrik, Kevin Kenney, Ahmad Alsheekh, Yuriy Ostrozhynskyy, Anil Hingorani, Enrico Ascher, Sareh Rajaei - Vascular Institute of New York, Brooklyn, NY

OBJECTIVE: Iliac vein stenting has become a mainstay in the management of chronic venous insufficiency (CVI) due to nonthrombotic iliac vein lesions (NIVLs). Historically, treatment of CVI has been based on the presence of venous reflux. Prior literature has been conflicting regarding the effect of iliac vein stenting on superficial venous reflux. This study aimed to identify the effect of bilateral iliac vein stenting on superficial venous reflux rates.

METHODS: In this retrospective study spanning the course of 5 years we performed 2066 venograms with venoplasties and stenting of the iliac veins. Pre-operative and post-operative venous mapping was performed via duplex ultrasound, in which reflux rates were documented. Patients who received any lower extremity vascular intervention between “pre-” and “post-stenting” duplex ultrasounds, other than iliac vein stenting, were excluded from analysis. This was done to prevent other procedures from influencing superficial venous reflux rate.

RESULTS: 1033 patients, of which 65% were female, underwent bilateral iliac vein stenting. The average age of the patient cohort was 66 (range 22-100; SD +/- 13.9). The CEAP scores were C₂ (1%), C₃ (25%), C₄ (51%), C₅ (5%), and C₆ (18%). The table reports the pre- and post-stent average reflux measurements, standard deviations, and associated p-values.

CONCLUSION: Bilateral iliac vein stenting decreased great saphenous vein and small saphenous vein reflux. Reduction in stenosis of the iliac veins may influence superficial venous reflux.

Table.

Limb	Vein Segment	Pre-Stent Average (ms)	SD	Post-Stent Average (ms)	SD	p-value
LLE	GSV	2123.68	1624.59	1724.61	1566.39	0.00001
LLE	SSV	1471.61	1363.68	1111.17	1128.63	0.00003
LLE	ASV	1513.44	1735.12	1424.84	1278.41	0.77
RLE	GSV	2043.88	1585.36	1715.38	1611.42	0.0001
RLE	SSV	1548.58	1466.69	1218.21	1327.15	0.0002
RLE	ASV	848.23	969.84	969.84	1539.56	0.09

Full Program & Abstracts

5:12 pm – 5:24 pm

38

Opioid Consumption Following Carotid Revascularization

Mark D. Balceniuk, Peng Zhao, Isabelle V. Chu, Brian C. Ayers, Tianna M. Negron, Kathleen Raman, Jennifer L. Ellis, Adam J. Doyle, Roan J. Glocker, Michael C. Stoner - University of Rochester Medical Center, Rochester, NY

INTRODUCTION AND OBJECTIVES: Opioid overdose is now the leading cause of injury-related death in the United States. Over prescription of opioids is one factor contributing to this epidemic. Previous studies demonstrated an over prescription of opioids, compared to patient consumption, following general surgery procedures. Our objective is to evaluate opioid consumption following carotid revascularization.

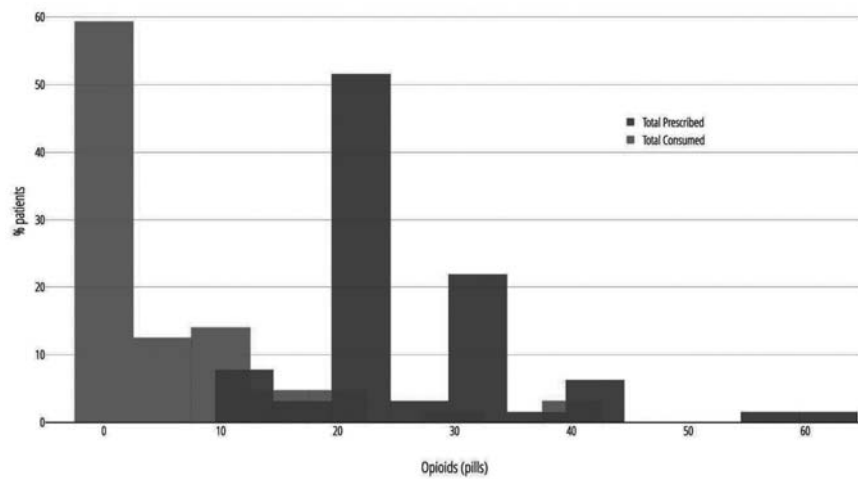
METHODS: This is a retrospective review of the opioid prescribing habits following discharge of carotid revascularization. Patients who were documented to receive an opioid prescription were included. A phone survey was conducted to determine patient consumption of the prescribed pills. Surgical procedures include carotid endarterectomy (CEA) and transcarotid arterial revascularization (TCAR). The primary outcome is the difference between opioids prescribed and opioids consumed.

RESULTS: There were 209 patients available for inclusion (Table). The mean age was 68 years with white (98%) males (58%) making up most patients. CEA and TCAR accounted for 75% and 25% of cases, respectively. 98 (47%) patients were prescribed opioids following discharge. 8 were excluded from analysis (3 for prior opioid use, 5 declined participation). 71% of patients participated in the survey. A total of 1623 pills were prescribed (25.4 ± 5.5 per patient), but only 336 pills consumed (5.3 ± 1.1 per patient) (Figure). 1287 (79% of total) pills were not consumed.

CONCLUSIONS: These data are the first to compare opioid prescription with opioid consumption following carotid revascularization. We demonstrate that patients consume much less opioids than prescribed. These findings indicate that a reduction in opioid prescriptions may be possible following carotid revascularization.

Full Program & Abstracts

Figure.



Full Program & Abstracts

Table. Opioid Prescription Characteristics

	Carotid Revascularization
Total Patients	209
Prescribed opioids	98 (47%)
Excluded	8
Hx opioid use	3
Declined	5
Total Eligible	90
Participated in Survey	64 (71%)
Filled Prescription	41 (66%)
Total pills prescribed	1623
Mean \pm SE	25.4 \pm 5.5
Median [Range]	20 [10-90]
Total Pills Consumed	336
Mean \pm SE	5.3 \pm 1.1
Median [Range]	0.5 [0-42]
Pills Remaining	1287 (79%)
Patients receiving refills	0 (0%)

Full Program & Abstracts

5:24 pm – 5:36 pm

39

Prolonged Door to Intervention Time is Not Associated with Inferior Outcomes for Ruptured AAAs

Frank M. Davis, Danielle C. Sutzko, Margaret E. Smith, Katherine Gallagher, Peter K. Henke, Nicholas H. Osborne - University of Michigan, Ann Arbor, MI

INTRODUCTION AND OBJECTIVES: Abdominal aortic aneurysm rupture (rAAA) is a surgical emergency which carries a high mortality rate. Recent SVS guidelines established a goal “door-to-intervention” time of <90 minutes for rAAA. However, there are limited studies benchmarking the clinical benefit of <90-minute time to intervention. We sought to assess the proportion of patients meeting the current guidelines and clinical outcomes associated with decreased door-to-intervention time.

METHODS: We identified patients undergoing open and endovascular rAAA repair in the 2003-2018 Vascular Quality Initiative registry. Patients were dichotomized into <90 or >90-minute door-to-intervention time cohorts. Risk-adjusted major complication and mortality rates were calculated using multivariable logistic modeling using preoperative demographics, medical history, and hemodynamic parameters.

RESULTS: A total of 3,630 operative cases for rAAA were identified (1696 open repairs and 1934 endovascular repairs). For the open repair cohort, 1035 patients (61%) had a door-to-intervention time of <90 minutes. Among the open repair patients, there was no difference in risk-adjusted major complications or mortality (37.4% vs. 37.2%, $p=0.94$) between the <90 and >90-minute cohorts. For endovascular repair, 1014 patients (53.8%) had a door-to-intervention time of <90 mins. Similar to open rAAA repair, among patients undergoing endovascular repair there was no difference in risk-adjusted mortality between the <90 vs. >90-minute door-to-intervention cohorts (25.2% vs 21.8%; $p=0.08$). rAAA endovascular repairs with <90-minute door-to-intervention time did have higher rates of postoperative MI (12.0% vs. 8.5%; $p<0.05$) and reoperation (19.6% vs. 12.4%; $p<0.05$).

CONCLUSIONS: A low percentage of rAAAs (~55%) are being treated within the SVS guideline of door-to-intervention time of <90 minutes. For both open and endovascular rAAA repairs there is no mortality benefit for treatment within 90 minutes of presentation. Based on these findings, alternative quality metrics should be identified to improve the clinical care of rAAA patients.

Full Program & Abstracts

5:36 pm – 5:48 pm

40

Comparison of Perioperative Outcomes Following Iliac Branch Endoprostheses (IBE) Compared to Hypogastric Occlusion or Open Surgery for Elective Treatment of Aortoiliac Aneurysms in the NSQIP Database

Mario D'Oria, Bernardo Mendes, Katherine Bews, Jill Johnstone, Fahad Shuja, Manju Kalra, Thomas Bower, Gustavo Oderich, Randall DeMartino - Mayo Clinic, Rochester, MN

INTRODUCTION: Iliac branch endoprostheses (IBE) can treat aortoiliac aneurysms (AIAs) less invasively than open surgery (OS) and preserve pelvic perfusion. We postulate that postoperative complications after AIAs treatment are similar between IBE and hypogastric occlusion with coil and cover (C&C), and lower than OS.

METHODS: We identified patients undergoing elective infrarenal AIA repair by IBE, C&C, and OS within the NSQIP aneurysm database (2012-2016). Baseline characteristics, procedural variables, and perioperative outcomes were compared. The primary outcome was any major complication/death. Secondary outcomes included minor complications, total operation time, length of stay (LOS), and 30-day reinterventions. Multivariable logistic analysis was performed to adjust for patient and procedural variables.

RESULTS: We identified 593 patients (83% males, mean age 71.6 years) undergoing AIA repair (IBE=283, C&C=118, OS=192). Age, ASA classification, and aneurysm diameter varied between groups (Table). OS was associated with higher rate of major complications (65.6% vs. IBE:8.8% & C&C:13.6%, $p<.01$) and higher mortality (3.6% vs. IBE:0.7% & C&C:0%, $p=.017$). Minor complications and 30-day reinterventions were similar. IBE patients had significantly shorter operative time, total and ICU LOS (Table). After adjustment, OS was associated with higher major complications compared to IBE (OR 11.3, 95%CI 5.8-21.9, $p<0.001$), but due only to use of transfusions (OR 1.3, 95% CI 0.6-2.8, $p=0.52$ when excluding transfusions). Major complications between IBE and C&C were similar (OR 1.6, 95%CI 0.8-3.4, $p=0.228$).

CONCLUSIONS: IBE for AIAs is associated with favorable post-operative outcomes and a lower rate of major complications compared to OS, primarily due to lower transfusion use. IBE was similar to C&C. Pending long term outcomes, IBE appears to be associated with several perioperative and treatment advantages to eligible patients with AIAs compared to OS and C&C approaches.

Full Program & Abstracts

Table. Patient, Procedural and Outcomes after Aortoiliac Aneurysm Repair In NSQIP

Variable	IBE Group N=283	Coil and Cover Group N=118	Open Surgery Group N=192	Total N=593	P value
Age, years; mean \pm SD	72.4 \pm 8.9	73.8 \pm 8.6	69.2 \pm 8.7	71.6 \pm 9.0	<0.001
Sex, males; number, %	236, 83.4%	101, 85.6%	157, 81.8%	494, 83.3%	0.680
ASA class 1-3; number, %	226, 79.9%	84, 71.2%	134, 70.2%	444, 75.0%	0.032
AAA diameter, cm; mean \pm SD	5.5 \pm 1.1	5.2 \pm 1.4	5.9 \pm 1.2	5.6 \pm 1.2	<0.001
Death; Number, %	2, 0.7%	0, 0%	7, 3.6%	9, 1.5%	0.017
Major complications; number, %	25, 8.8%	16, 13.6%	126, 65.6%	167, 28.2%	<0.001
Major complications excl. transfusions; number, %	15, 5.3%	8, 6.8%	33, 17.2%	56, 9.4%	<0.001
Minor complications; number, %	6, 2.1%	3, 2.5%	4, 2.1%	13, 2.2%	0.936
Total LOS, days, mean \pm SD	2.2 \pm 3.2	2.5 \pm 3.9	8.0 \pm 7.9	4.1 \pm 5.9	<0.001
ICU LOS, days; mean \pm SD	0.5 \pm 1.4	0.5 \pm 1.4	2.9 \pm 3.7	1.3 \pm 2.6	<0.001
Procedure time, minutes; mean \pm SD	137.6 \pm 71.2	170.9 \pm 84.4	225.6 \pm 101.1	172.7 \pm 92.8	<0.001
30-day reintervention; number, %	8, 2.8%	7, 5.9%	13, 6.8%	28, 4.7%	0.109

Full Program & Abstracts

5:48 pm – 5:56 pm

41 (RF)

A Survey of 2018 Integrated Vascular Surgery Applicants and Trends in the Integrated Vascular Surgery Match

Mark Conant¹, James Brooks¹, Murray Shames¹, Jason T. Lee², Jeffrey Jim³ - ¹University of South Florida, Tampa, FL; ²Stanford University, Stanford, CA; ³Washington University St. Louis, St. Louis, MO

INTRODUCTION AND OBJECTIVES: The number of integrated “0+5” vascular surgery residency (VS-I) programs and their applicants have increased since 2008. This has resulted in increased cost to both the VS-I applicants and programs. Our objective was to assess the current cost of successfully matching into VS-I while describing the competitive nature of the match process using survey and historical data.

METHODS: A cross-sectional survey of the 2018 VS-I applicants was conducted via a questionnaire sent to all applicants that applied through the ERAS system to 3 VS-I programs. Variables quantified included cost of interview season and willingness to participate in on-site, central and/or video interview. A review of data collected from 2008 to 2018 by the NRMP and AAMC was also conducted. Number of applicants per year to VS-I through ERAS and NRMP and average number of contiguous ranks were analyzed.

RESULTS: 30% of the 58 matched applicants responded to the survey. Of those respondents, 78% were amenable to a central interview and 61% were amenable to a video interview. An average of \$7,916 was spent by each matched applicant. VS-I positions increased from 2008- 2018. The number of NRMP participants per position decreased 2008-2018; however, total number of ERAS applicants to VS-I increased. Average cost of matching into VS-I in 2018 is more than double the cost of the average residency application in 2018 based upon inflation adjusted data from 2015.

CONCLUSIONS: The cost of matching into VS-I is well-above the inflation-adjusted mean cost of matching into any residency position in 2015. Alternative interview techniques may ameliorate cost, as the majority of surveyed VS-I applicants were amenable to a remote video interview and/or a central interview. These methods may provide an alternative to the historical interview process that can increase interview efficiency while decreasing cost to both parties.

Full Program & Abstracts

5:56 pm – 6:04 pm

42 (RF)

Vascular Access Types and Outcomes Vary Significantly by Race and Ethnicity

Timothy Copeland, Peter F. Lawrence, Karen Woo - UCLA, Los Angeles, CA

OBJECTIVE: To determine the association of race/ethnicity with initial vascular access type, time to removal of tunneled hemodialysis catheter (THC), probability of repeat vascular access and time to repeat vascular access.

METHODS: The Optum Clinformatics database (claims data from a large managed care organization) was queried from 2011 to 2016 for patients who initiated hemodialysis with a THC. Multivariable models included age, sex, diabetes, vascular access type, cardiac arrhythmia, congestive heart failure, peripheral vascular disease and obesity as covariates.

RESULTS: 7584 patients were identified with a median follow-up of 583 days. Compared to Whites, Blacks were more likely to be younger and have diabetes and less likely to be male (Table). On multivariable analysis, Blacks were 60% more likely than Whites to undergo index AVG vs AVF (OR 1.6, 95% CI 1.4, 1.8). Hispanics were more 9.6% more likely than Whites to have a shorter time to THC removal (HR 1.096, 95% CI 1.02, 1.18). There was no difference between Blacks and Whites in time to THC removal. 28.4% of patients underwent a second access: Asians 26%, Blacks 34.9%, Hispanics 27.2% and Whites 26%. Blacks were 56% more likely than Whites to undergo repeat access (OR 1.56, 95% CI 1.37, 1.78) and 43% more likely to have a shorter time to second access (HR 1.43, 95% CI 1.28, 1.60).

CONCLUSION: These results suggest that after initial vascular access, Blacks have no difference in initial success compared to Whites, but their access fails earlier and more frequently, independent of access type, age and co-morbidities. Given that Blacks constitute 27% of the US hemodialysis population, it is imperative that future research investigate the root cause of these disparities.

Full Program & Abstracts

Table.

	Asian (%) n=285	Black (%) n=1831	Hispanic (%) n=1286	White (%) n=4182	P-value
Mean age (SD)	67.7 (14)	66.6 (13)	68.2 (13)	69.5 (12)	<0.001
Fistula (vs graft)	226 (79)	1278 (70)	1043 (81)	3305 (79)	<0.001
Male	177 (62)	869 (47)	762 (59)	2492 (59)	<0.001
Diabetes	238 (83)	1572 (86)	1163 (90)	3347 (80)	<0.001
Cardiac Arrhythmia	204 (72)	1393 (76)	928 (72)	3344 (80)	<0.001
Congestive Heart Failure	214 (75)	1488 (81)	1033 (80)	3421 (82)	0.035
Peripheral Vascular Disease	204 (72)	1326 (72)	1003 (78)	3035 (73)	0.001
Obesity	64 (22)	780 (43)	513 (40)	1743 (42)	<0.001

7:00 pm – 10:00 pm

PRESIDENT'S DINNER

Full Program & Abstracts

Sunday, February 3, 2019

6:30 am – 7:00 am Continental Breakfast

6:30 am – 9:00 am Registration

7:00 am – 9:00 am **SCIENTIFIC SESSION V**
Moderators: James Black, MD & Caitlin Hicks, MD

7:00 am – 7:12 am 43
Selective Use of Anticoagulation or Dual Antiplatelet Therapy for Patients with Extra-Anatomic Bypasses
Victoria G. Teveris¹, Jesse Columbo¹, Peter Bartline², Philip Goodney¹, David Stone¹, Bjoern Suckow¹ - ¹Dartmouth-Hitchcock Medical Center, Lebanon, NH; ²University of Wisconsin, Madison, WI

INTRODUCTION AND OBJECTIVES: The benefit of long-term anticoagulation or dual antiplatelet therapy (DAPT) for extra-anatomic bypass patients remains poorly defined. We compared outcomes among these patients based on antithrombotic regimen.

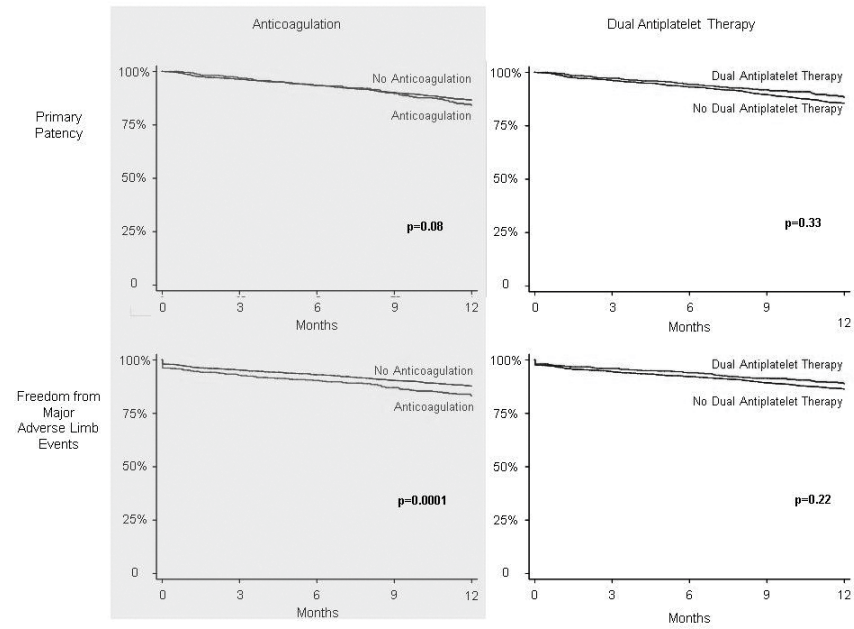
METHODS: We studied patients who underwent axillo-femoral or femoral-femoral bypass within the Vascular Quality Initiative with one-year follow-up data. Primary exposures were anticoagulation and DAPT, at the time of index procedure and one-year follow-up. Primary outcomes were major adverse limb events (MALE) defined as reintervention or above-ankle amputation, and primary patency. We analyzed outcomes using Kaplan-Meier estimation and examined factors associated with choice of antithrombotic therapy via logistic regression.

RESULTS: Our cohort included 2,760 patients (axillo-femoral bypass n=857, femoral-femoral bypass n=1,903) across 168 centers from 2009-2018. Mean age was 66.5 ±10.5 years and 59.0% were male. Patients were infrequently prescribed long-term anticoagulation (19%) or DAPT (22%). One-year primary patency was 86.1% and was similar by anticoagulation (log-rank p=0.08; Figure) and DAPT status (log-rank p=0.33). Freedom from MALE was 86.8% at 1 year and was slightly inferior for patients on anticoagulation (87.6% versus 83.2%, log-rank p=0.001) but was similar by DAPT (log-rank p=0.22). Anticoagulation was more commonly prescribed according to disease severity, such as rest pain (adjusted odds ratio (OR): 1.87 (95% confidence interval (CI): 1.39-2.52), tissue loss (OR: 1.96, CI: 1.35-2.84), or acute ischemia (OR: 2.08, CI: 1.47-2.93). Patients were more commonly prescribed DAPT according to comorbidities, including hypertension (OR: 1.44, CI: 1.05-1.96) and coronary disease (OR: 1.58, CI 1.27-1.96).

CONCLUSIONS: Antithrombotics are selectively employed in extra-anatomic bypass patients, the choice of which appears associated with disease severity (anticoagulation) or comorbidities (DAPT). Outcomes of primary patency and MALE are similar with focused utilization of antithrombotics.

Full Program & Abstracts

Figures.



Full Program & Abstracts

7:12 am – 7:24 am

44

Sexual Harassment in Vascular Surgery Training Programs

Melanie Nukala¹, Mollie Freedman-Weiss², Peter Yoo²,
Matthew R. Smeds¹ - ¹Saint Louis University, Saint Louis,
MO; ²Yale University, New Haven, CT

INTRODUCTION AND OBJECTIVES: Sexual harassment is any unwelcome behavior or obscene remark that affects an individual's work performance or creates an intimidating, hostile or offensive environment. We sought to examine its presence in vascular surgery training programs, identify factors associated with occurrence, and determine reporting barriers.

METHODS: An anonymous survey consisting of questions on frequency of sexual harassment including type/perpetrators/locations; why/how the practice occurs; reporting mechanisms/barriers to reporting and demographic information was emailed to all vascular surgery trainees in the United States. Descriptive and univariate analysis was performed.

RESULTS: Of 498 invitations sent, 133 (27%) completed the survey. 50/133 (38%) thought harassment occurred more commonly in surgical specialties with hierarchy/power dynamics, historical male dominance in field, and ignoring of behavior the most common reasons cited that it still occurs. 81/133 (61%) respondents have either experienced (63/133, 47%) or witnessed (18/133, 14%) other trainees being harassed, with being called a sexist slur/intimate nickname the most common behavior. Those affected were more commonly female ($p=0.0006$), with the most common perpetrator a surgical attending, and the most common area of occurrence the operating room. Reasons for not reporting included believing the behavior was harmless in intent (33/63, 52%) and feeling nothing would come of it if reported (28/63, 44%), but 15/63 (24%) feared repercussions and 15/63 (24%) felt uncomfortable identifying as a target of sexual harassment. 46/133 (35%) of respondents were not aware of institutional mechanisms for reporting harassment, with only 70/133 (53%) feeling comfortable reporting to their departmental leadership.

CONCLUSIONS: A significant number of vascular surgery trainees have experienced sexual harassment during their training. Over a third of respondents do not know institutional mechanisms for reporting, and almost half do not feel comfortable reporting to departmental leadership. Increasing education on harassment and reporting mechanisms may be necessary in vascular surgery training programs.

Full Program & Abstracts

7:24 am – 7:36 am

45

Superior Short- and Long-Term Cardiovascular Morbidity and Mortality in Patients Undergoing PTFE Tibial/Peroneal Arterial Revascularization Compared to Primary Amputation

Nicholas J Gargiulo, III - The Brookdale University Hospital & Medical Center, Mineola, NY

BACKGROUND: Polytetrafluoroethylene (PTFE) tibial and peroneal arterial bypasses have superior short and long-term cardiovascular outcome compared to primary amputation.

METHODS: A retrospective analysis was performed on a cohort of 23,391 patients with critical limb ischemia requiring revascularization between July 1977 and January 2017. In this cohort, 443 (1.89%) of the 23,391 patients underwent 443 PTFE bypasses to a tibial or peroneal artery without any adjunctive procedure. In this same cohort, 103 (0.44%) patients had no distal target vessel for revascularization. Cumulative life table primary and secondary patency and limb salvage rates were calculated for all PTFE tibial and peroneal artery bypass procedures. Short (30 day) and long-term (1 year/5 year) cardiovascular morbidity and mortality were compared between the PTFE and primary amputation group.

RESULTS: Five- and 10-year primary patency and five- and 10-year limb salvage for the PTFE cohort was 34.0%, 33%, 73.3%, and 33% respectively. Short term (30 day) cardiovascular outcome in the PTFE (0.3%, 0.5%, 0%) cohort far exceeded that in the primary amputation (3%, 7%, 21%) group with regards to stroke, MI and death. These short term cardiovascular benefits were also observed long term both at 1 and 5 years in the PTFE (0.7%, 1.1%, 9%) cohort as compared to the primary amputation (5%, 13%, 17%) cohort.

CONCLUSIONS: PTFE arterial bypasses without adjunctive procedures to infrapopliteal arteries is an acceptable alternative option for those patients without autologous vein facing imminent amputation. Several important perioperative strategies may help improve PTFE graft patency and overall limb salvage. We have observed a superior short (30 day) and long-term (1/5 years) cardiovascular morbidity and mortality in those patients undergoing PTFE grafting as compared to those undergoing primary amputation.

Full Program & Abstracts

7:36 am – 7:44 am

46 (RF)

Ambulatory Status Following Major Lower Extremity Amputation

Katherine P. MacCallum, Patricia Yau, Karan Garg -
Montefiore Medical Center, Bronx, NY

INTRODUCTION/OBJECTIVES: The ability to ambulate following major lower extremity amputation, either below (BKA) or above knee (AKA), is a major concern for all prospective patients. This study analyzed ambulatory rates and risk factors for non-ambulation in patients undergoing a major amputation.

METHODS: A retrospective review of 811 patients who underwent BKA or AKA at our institution between January 2009 and December 2014 was conducted. Demographic information and comorbid conditions, including the patients' functional status prior to surgery, at 6 months, and at latest follow up was recorded. Following exclusion criteria 538 patients were reviewed. Patients who were either independent or used an assistive device were considered ambulatory; those who were completely wheelchair-dependent or bed-bound were considered non-ambulatory.

RESULTS: Preoperatively, the majority of BKA patients were ambulatory and significantly more so than those undergoing an AKA (83.2% vs 44.9%, $p < 0.0001$). At 6 month follow-up these percentages fell to 60.0% of BKA and 25.2% of AKA patients. At latest follow up (average 2.74 years) there was a trend toward improvement with 64.3% of BKA and 29.1% of AKA patients ambulating. Risk factors for not ambulating included age > 70 (OR 4.520, 95% CI 2.912-7.014), non-ambulatory status prior to amputation (12.077, 6.519-22.371), and admission from a nursing facility (3.949, 2.382-6.547). None of the comorbid conditions recorded (diabetes, renal insufficiency, end stage renal disease, peripheral vascular disease, or body mass index > 30) was found to have a statistically significant correlation with non-ambulatory status.

CONCLUSION: The majority of patients were able to ambulate with assistance following BKA. For most patients, ambulatory status at six months was the same as at most recent follow up.

Full Program & Abstracts

7:44 am – 7:52 am

47 (RF)

Virtual Histology of Human Arterial Wall Segments Using Microcomputed Tomography for Soft Tissue Imaging

Scott T. Robinson¹, Ruth Levey¹, Eimear Dolan¹, David Connolly¹, Marcus Chin¹, Nicholas H. Osborne², Peter Dockery¹, Peter K. Henke², Garry P. Duffy¹ - ¹NUI Galway, Galway, Ireland; ²University of Michigan, Ann Arbor, MI

INTRODUCTION AND OBJECTIVES: Current quantitative methods for evaluating arterial wall specimens often rely on histological techniques that involve random sampling of a large tissue specimen. Random sampling cannot account for the special distribution of features along the length of the artery, and tissue processing and sectioning can lead to artifact that distorts native tissue morphology leading to inaccurate measurements. To overcome the inherent limitations of traditional histology-based approaches, we developed a non-destructive method for three-dimensional imaging of intact human blood vessels using microcomputed tomography (microCT).

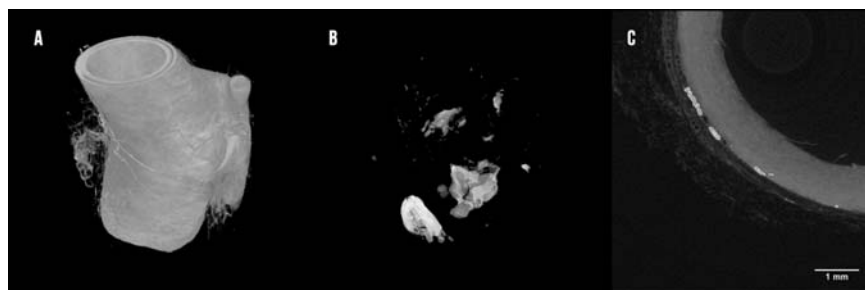
METHODS: Whole human artery segments (carotid bifurcation, common femoral artery, aortic bifurcation) were dissected from cadavers. Tissues were transferred to either 70% ethanol and stained in 2.5% phosphomolybdic acid (PMA) solution or transferred to 100% ethanol and stained with 1% iodine solution. Image acquisition was performed with a Scanco μ CT 100. Image visualization and segmentation was performed with ImageJ, CTVox (Bruker), and Mimics (Materialise) software.

RESULTS: Staining of cadaveric vessels with PMA or Iodine resulted in clear visualization of the soft tissue of the blood vessel wall with microCT. There was excellent preservation of tissue morphology, and high-resolution images with a minimum voxel size of 5.4 μ m could be obtained. Calcified portions of the vessel wall were easily segmented using Mimics software. Both PMA and iodine stain preferentially bound residual thrombus in small vessels within the specimen, thus enabling clear visualization and segmentation of the vasa vasorum.

CONCLUSIONS: Soft tissue imaging with microCT is a powerful tool for high resolution, nondestructive, 3-dimensional analysis of ex vivo blood vessels.

Full Program & Abstracts

Figure. A) 3D Rendering of Carotid Bifurcation B) Segmentation of Calcium Deposits within Carotid Bifurcation C) Segmentation of Vasa Vasorum in Adventitia of Internal Carotid Artery



Full Program & Abstracts

7:52 am – 8:00 am

48 (RF)

Ambulatory Patients Undergoing Above-Knee Amputation Have Significantly Higher Post-Operative Mortality Compared to Non-Ambulatory Patients

Patricia Yau¹, Charles DeCarlo², Katherine Maccallum¹, Patricia Friedmann³, Larry Scher¹, Saadat Shariff¹, Evan Lipsitz¹, Karan Garg¹ - ¹Montefiore Medical Center, Bronx, NY; ²Massachusetts General Hospital, Boston, MA; ³Albert Einstein College of Medicine, Bronx, NY

INTRODUCTION AND OBJECTIVES: Above-Knee Amputation (AKA) is associated with higher mortality than Below-Knee Amputation (BKA), however, factors contributing to this difference have not been well elucidated. Given the reported difference in pre- and post-operative ambulatory rates in patients undergoing an AKA or BKA, we sought to determine the effect of pre-operative ambulatory status on mortality.

METHODS: Institutional data for patients undergoing AKA and BKA between 2009 and 2014 was queried. Outcomes were 30-day, 90-day, and one-year post-operative mortality. Predictors of outcomes were determined with multivariate logistic regression and Cox proportional hazards modeling.

RESULTS: 811 patients underwent AKA (40.2%) or BKA (59.8%). Mean age was 68.8+/-14.9 years, 53.8% were male, and 33.4% were non-ambulatory (AKA 54.6%, BKA 19.2%). Thirty- and 90-day mortality was 8.4% (AKA 13.5%, BKA 4.9%) and 15.1% (AKA 23.6%, BKA 9.5%), respectively. Ambulatory AKA patients had significantly higher 30- and 90- day mortality (18.9% and 25.7%, respectively) than non-ambulatory AKA patients (8.5% and 21.0%). Ambulatory BKA patients had lower 30- and 90-day mortality (4.3% and 7.1%), compared with non-ambulatory BKA's (7.5% and 19.4%). Predictors of 30-day mortality for AKA patients were ambulatory status, COPD, ESRD on hemodialysis, and emergency surgery. One-year mortality was 37.4% for AKA patients (ambulatory 36.5%, non-ambulatory 38.2%, p=0.75). Predictors of one-year mortality for AKA patients were age greater than 70, white race, ESRD on dialysis, emergency surgery, and COPD.

CONCLUSIONS: While ambulatory status is an independent predictor of early post-operative mortality after AKA, it is not associated with one-year mortality, suggesting that ambulatory patients requiring an AKA are more severely ill on presentation. Further focus on this high-risk group of patients may help to improve survival following major amputation.

Full Program & Abstracts

Table. Independent Predictors of One-Year Mortality for AKA Patients

	Hazard ratio (95% CI)	p-value
Age > 70	1.59 (1.03 - 2.43)	0.03
White race	1.63 (1.09 - 2.46)	0.02
ESRD on HD	1.68 (1.05 - 2.70)	0.03
Emergency surgery	1.67 (1.34 - 5.27)	0.02
COPD	2.66 (1.08-2.58)	<0.01

Full Program & Abstracts

8:00 am – 8:12 am

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Early Real World Experience with Endoanchors Based on Indication

Vy T. Ho, Elizabeth L. George, Anahita Dua, Kedar S. Lavingia, Michael D. Sgroi, Michael D. Dake, Jason T. Lee - Stanford University, Stanford, CA

INTRODUCTION: Endoanchors (EAs) are a recently FDA-approved system for treating endoleaks, device migration, or high-risk seal zones. Industry-sponsored registries have reported safety and efficacy. We reviewed our early outcomes with EAs in (T)EVAR patients.

METHODS: We retrospectively reviewed patients undergoing treatment with Heli-Fx endoanchors in a single center.

RESULTS: From 2016-2018, 35 patients underwent EA fixation. We divided the cohort by indication: Group A (repair of prior endoleak), B (intraoperative type 1A endoleak), C (high-risk seal zone), and D (TEVAR). In Group-A (n=11), 81.8% of endoleaks were type-1A. A mean 10-EAs were used. At 10-month mean follow-up, 27% of endoleaks resolved with mean 4.3-mm increase in sac diameter. Overall survival was 81.8% with two 30-day re-interventions (translumbar coil embolization; proximal graft extension with bilateral renal artery stents). Group-B (n=9), had a mean 8.7-EAs used with 100% resolution of intraoperative endoleak. One complication occurred (right iliac dissection from sheath manipulation, treated with covered stent). At 13-month mean follow-up, there was significant sac shrinkage (mean 9.75 mm) with no type 1A endoleaks. Group-C (n=9) had a mean of 9.7-EAs used. At 11-month mean follow-up, there were no proximal endoleaks and modest sac shrinkage (mean 3.4-mm). Overall survival was 100% with one complication (ischemic colitis requiring sigmoidectomy/colostomy). Group-D (N=6) had a mean of 8.3-EAs used. At 9-month mean follow-up, overall survival was 83.3% with a mean 2.3-mm increase in sac diameter. One intraoperative complication occurred, in which an EA embolized to the left renal artery. Postoperatively, the patient had a retrograde type A dissection and cardiac arrest.

CONCLUSION: Early experience suggests EAs effectively treat intraoperative type-1A endoleaks and high-risk seal zones, with significant sac regression and no proximal endoleaks on follow-up. In postoperative type-1A endoleaks, fewer than one-third resolved. Further experience is necessary to determine which patients benefit from postoperative EA fixation.

Full Program & Abstracts

8:12 am – 8:24 am

50

Factors Associated with Amputation after Peripheral Vascular Intervention (PVI) for Intermittent Claudication in the Vascular Quality Initiative (VQI)

John C. Axley¹, Zdenek Novak¹, Salvatore T. Scali², Mark A. Patterson¹, Benjamin J. Pearce¹, Graeme E. McFarland¹, Emily S. Spangler¹, Marc A. Passman¹, Adam W. Beck¹ -
¹University of Alabama at Birmingham, Birmingham, AL;
²University of Florida College of Medicine, Gainesville, FL

INTRODUCTION AND OBJECTIVES: The natural history of intermittent claudication (IC) requiring major amputation (AMP) is reportedly 1-3% over 5-years. However, with increasing use of PVI to manage IC, it is unclear if the natural history and subsequent AMP risk has changed. Existing literature is insufficient due to trial cohorts and low event rates, preventing appropriate risk stratification. Here we sought to address this knowledge gap by evaluating the incidence and determining the predictors of AMP following PVI for IC in the VQI.

METHODS: A retrospective analysis of elective PVI for IC in the VQI registry (2011-17) was completed. Only the index extremity was analyzed and patients undergoing bilateral interventions were excluded. The primary end-point was major AMP. Multivariable logistic regression in a stepwise variable reduction algorithm was employed to identify factors associated with AMP.

RESULTS: A total of 21,769 procedures were analyzed. Rates of major and minor AMP following ipsilateral PVI at 1-year follow-up (VQI defined: 9-21 months post-operation)[median follow-up = 12.6 months] were 0.8% and 1.0%, respectively. Median time from intervention to major AMP was 7.3 months (IQR range 3.2-10.8). Preoperative ABI was associated with AMP-free survival (Log rank p <0.001, Figure). Multiple independent predictors of AMP after PVI for IC were identified (Table).

CONCLUSIONS: Amputation after PVI for IC can be considered a clinical failure. Although low risk overall, certain subgroups undergoing PVI for IC have higher risk of major AMP. Several physiologic and anatomic variables are identified that can inform clinicians about the appropriateness of PVI in this population.

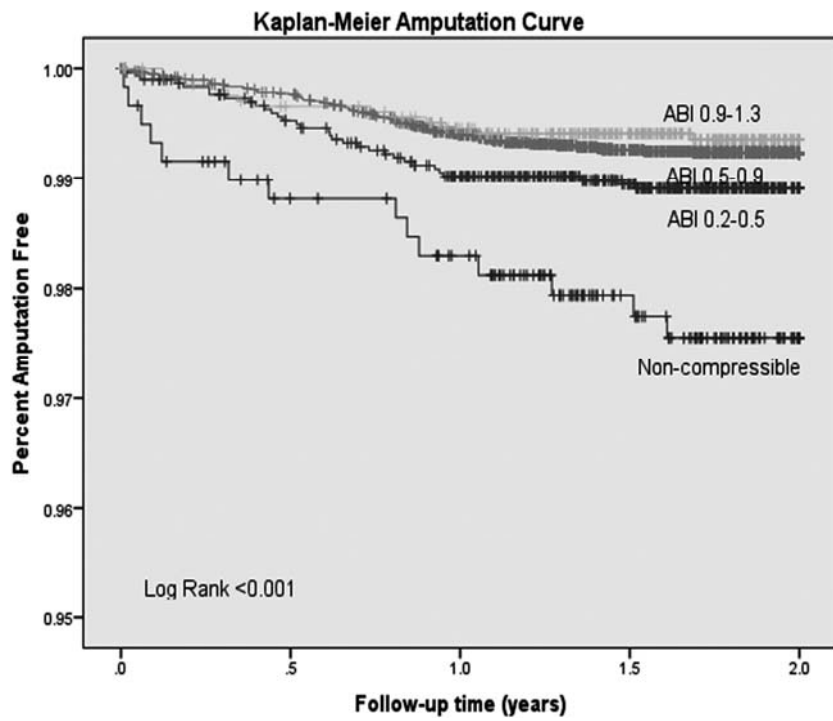
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Table. Significant Prognostic Factors Leading to Major Amputation.
**Noted Artery Compared to Aortic Artery. ** Discharge Location Compared to Home
 ^Compared to Three Patent Outflow Arteries*

Significant prognostic factors	Odds Ratio	95% C.I. for EXP(B)		P-value
		Lower	Upper	
Age at procedure	0.982	0.966	0.998	0.031
Ant. Tibial artery intervention*	2.727	1.575	4.721	<0.001
Peroneal artery intervention*	2.708	1.403	5.228	0.003
Profunda artery intervention*	3.089	1.361	7.012	0.007
Anticoagulation at discharge	1.668	1.092	2.55	0.018
Discharge to rehab**	3.405	1.148	10.1	0.027
Discharge to other hospital**	27.09	3.037	241.637	0.003
Requiring dialysis	2.821	1.425	5.558	0.003
Zero patent outflow arteries^	2.711	1.027	7.157	0.044
One patent outflow arteries ^	2.189	1.422	3.371	<0.001
History of ipsilateral bypass	2.135	1.149	3.966	0.016
History of ipsilateral bypass and PVI	2.892	1.636	5.11	<0.001
Coronary Artery Disease History	1.435	1.012	2.036	0.043
Insulin dependent diabetes	1.723	1.147	2.588	0.009
Prior amputation	4.994	3.223	7.739	<0.001
Weight in kilograms	0.985	0.976	0.995	0.003
Prior amputation	4.767	3.126	7.269	<0.001
Weight in kilograms	0.986	0.977	0.995	0.004

Full Program & Abstracts

Figure.



Full Program & Abstracts

8:24 am – 8:36 am

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Digital Pedometer Based Outcome Monitoring for Patients Undergoing Intervention for Intermittent Claudication

Reid Ravin¹, Ageliki Voyouka², Rami Tadros², Daniel Han², Daniel Fremed³, Peter Faries² - ¹Mount Sinai West Hospital, New York, NY; ²Mount Sinai Hospital, New York, NY; ³The Cardiovascular Care Group, Livingston, NJ

INTRODUCTION AND OBJECTIVES: Intervention for intermittent claudication (IC) is commonplace, but it is difficult to quantify the impact of an intervention on a patient's lifestyle. In this prospective trial, we assess the feasibility of using Fitbit digital pedometers to quantify walking distance before and after intervention and to determine whether patients with IC improve their average steps per day after intervention.

METHODS: We prospectively recruited 25 patients who were scheduled for an intervention to receive a fitbit prior to their procedures. Our primary outcome was average steps/day pre and post-procedure. Secondary outcomes included maximum steps/day pre and post-procedure, active minutes and calories burned. Inclusion criteria included Fitbit use for at least 7 days pre-procedure, and at least 14 days post-procedure.

RESULTS: We had a low overall study completion rate, with only 11/25 (44%) patients completing the requirements for analysis. The most common reasons for study drop out was device loss (n=6) and low device use (n=7). Of the included Subjects, there was no significant difference in pre-procedural steps/ day (3532.1) and post-procedural steps/ day (3187.5). This was despite a 100% technical success rate of the interventions, and improved PVRs in all subjects. Post-procedural patients had a higher average maximum distance in day totals 7904 v 6774 but this did not reach statistical significance p=.13. There were no differences noted in active minutes or calories burned.

CONCLUSIONS: The population in our study appeared to be sedentary at baseline with low average step/day totals. This study found no evidence that intervention leads to higher average step totals, which may suggest that resolution of claudication may not lead to increased ambulation. There was poor compliance with device use and a relatively high rate of device loss, which reflects a serious limitation of using wearable technology to track outcomes in this patient population.

Full Program & Abstracts

8:36 am – 8:48 am

52

Midterm Outcomes of Nellix EVAS According to Revised Instructions For Use

Kevin N. Peek, Manar Khashram - Auckland District Health Board, Auckland, New Zealand

INTRODUCTION AND OBJECTIVES: To compare midterm outcomes of patients who were treated with the Nellix device for endovascular aneurysm sealing (EVAS) within the revised instructions for use (rIFU) to those who were treated outside the rIFU.

METHODS: All Nellix EVAS cases for infrarenal or juxtarenal abdominal aortic aneurysm (AAA) >5cm in a single centre from November 2012 to September 2015 who had at least 24 month follow up were included. Pre-operative CT scans were reviewed by a vascular surgeon and interventional radiologist and categorized as either within or outside the revised IFU, as defined by the FORWARD IDE Registry. Follow up CT scans were performed at 1, 6, 12, 24, 36 and 48-month post procedure intervals where applicable. The primary outcomes were freedom from Type 1 endoleak, Sac expansion > 5mm, and aneurysm-related re-intervention. The composite endpoint was freedom from all primary outcomes and freedom from Aneurysm-related mortality.

RESULTS: 113 patients (mean age 76 years; 93 male) who had a mean aneurysm diameter of 60.5mm were included in the analysis. There were 45 patients (40%) in the On rIFU group and 69 patients (60%) in the Off rIFU group. The baseline characteristics and demographics were similar. The median follow up time was 36 months. Freedom from type 1A endoleak was significantly higher in the On rIFU group. There was no significant difference in freedom of type 1B endoleak, sac expansion >5mm, or aneurysm-related re-intervention. Freedom from the composite endpoint was significantly higher in the On rIFU group. All-cause mortality was significantly lower in the On rIFU group ($p < 0.05$).

CONCLUSIONS: Our results support the rIFU in midterm outcomes with significantly higher rate of type1A endoleak and the composite endpoint in those treated outside the rIFU.

Full Program & Abstracts

8:48 am – 9:00 am

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Frailty Syndrome in Patients with Carotid Disease: Simplifying How We Calculate Frailty

Viraj Pandit, Sandeep Jahjj, Ashton Lee, Bradley Trinidad,
Kaoru Goshima, Craig Weinkauff, Wei Zhou, Tze-Woei Tan -
University of Arizona, Tucson, AZ

INTRODUCTION: Frailty syndrome is established predictor of adverse outcomes after carotid surgery. Recently, a modified 5 factor NSQIP frailty index has been utilized however; its utility in vascular procedures is unclear. The aim of our study was to compare the mFI-5 to the mFI-11 regarding of value and predictive ability for mortality, postoperative infection, and unplanned 30-day readmission.

METHODS: The mFI was calculated by dividing the number of factors present for a patient by the number of available factors for which there were no missing data. Spearman's rho test was used to assess the correlation between the mFI-5 and mFI-11. Predictive models, using both unadjusted and adjusted logistic regressions, were created for each outcome for carotid endarterectomy using 2005-2012 NSQIP data, the last year all mFI-11 variables existed.

RESULTS: A total of 36,000 patients were included with mean age was 74.6 ± 5.9 years, complication rate 10.7%, and mortality rate 3.1%, and readmission rate is 6.2%. Correlation between the mFI-5 and mFI-11 was above 0.9 across all outcomes for patients. mFI-5 had strong predictive ability for mortality, postoperative complications and 30-days readmission (Table 1).

CONCLUSIONS: The mFI-5 and the mFI-11 are equally effective predictors of postoperative outcomes in patients undergoing carotid endarterectomy. mFI-5 is a strong predictor of postoperative complications, mortality and 30-d readmission.

Full Program & Abstracts

Table. Adjusted Comparison of mFI-5 and mFI-11

Outcomes	C- Statistics	OR [95% CI]
Mortality		
mFI-5	0.88 (0.81 – 0.94)	1.26 (1.1 – 1.9)
mFI-11	0.89 (0.84 – 0.93)	1.29 (1.15 – 1.93)
Post-Op Complications		
mFI-5	0.92 (0.85 – 0.95)	1.86 (1.21 – 2.74)
mFI-11	0.91 (0.81 – 0.97)	1.9 (1.42 – 2.95)
Readmission		
mFI-5	0.87 (0.81 – 0.92)	1.75 (1.2 – 2.4)
mFI-11	0.88 (0.84 – 0.96)	1.81 (1.3 – 2.7)

9:00 am

Annual Meeting Adjourns

Notes

Notes

Newly Elected Active Members ('18)

Oliver Aalami	Stanford University School of Medicine
Shahram Aarabi	University of Washington
Matthew Abate	St. Anthony's Medical Center
Dean Arnaoutakis	University of Florida
Joshua Arnold	University of Tennessee
Naveen Balasundaram	Cleveland Clinic Foundation
Adel Barkat	Loyola University Medical Center
Andrew Baxter	NYU Langone Medical Center
Jaime Benarroch-Gampel	Emory University School of Medicine
Joseph-Vincent Blas	Greenville Health Systems
Danielle Cafasso	New York Presbyterian
Brandon Cain	UAB
Allan Conway	Lenox Hill Hospital
Ramoncito David	Mayo Clinic
Victor Davila	Mayo Clinic
James Davis	Mayo Clinic
Chelsea Dorsey	Stanford Hospital
Yana Etkin	Northwell Health
Garietta Falls-Beddies	Wright State Physicians
Lindsay Gates	Yale New Haven Hospital
Matthew Goldman	Wake Forest Baptist Health
Ahmad Hussain	Scott & White Memorial Hospital
Kamran Jafree	Wright State University
Douglas Jones	Boston Medical Center
Dejah Judelson	UMass Memorial
Marcus Kret	Stanford University
Kathleen Lamb	Thomas Jefferson University Hospital
Werner Lang	University Hospital Erlangen
Charles Leithead	UAB
Melissa Loja	UC Davis
Paul Long	Baylor Scott and White
Gregory Magee	University of Southern California
Junaid Malek	Northshore Medical Center - MGH
Justin Margolis	St. Catherines of Sienna, Catholic Health Systems
Courtney Morgan	Northwestern Univeristy
Shardul Nagre	Wellmont Cardiology Services
Andrea Obi	University of Michigan
Zachary Osborne	Mayo Clinic
Mary Ottinger	University of South Florida
Pouria Parsa	Baylor University Medical Center
Syed Peeran	Appledore Medical Group/Coastal Cardiovascular Group
Varinder Phangureh	San Leandro Hospital
April Rodriguez	University of Washington
Sean Ryan	Beebe Medical Center
Daniel Scott	US Air Force
Jessica Simons	University of Massachusetts Medical School
Brigitte Smith	University of Utah
Robert Smith	Baylor Scott & White

Newly Elected Active Members *(continued)*

Jordan Stern Stanford University Hospitals & Clinics
Bjoern Suckow Dartmouth-Hitchcock Medical Center
Kevin Taubman University of Oklahoma College of Medicine, Tulsa
Richard Teed Vascular Specialists of Central Florida
Sam Tyagi Beth Israel Medical Center
Areck Ucuzian University of Maryland Medical Center
Brant Ullery Stanford University
Marie Unruh LSU Health Sciences Center
Karen Walker Johns Hopkins Hospital
Jessica Wallaert Coastal Cardiothoracic & Vascular Associates
Michael Williams Saint Louis University
Mathew Wooster University of South Florida

Newly Elected Candidate Members

Ahmed Abdelkarim	Zagazig University Faculty of Medicine
Hasan Aldailami	New York Presbyterian Hospital
Nina Bowens	Harbor-UCLA Medical Center
Bradley Bowles	Saint Louis University
Peris Castaneda	University of Michigan Medical School
Tatiana Chadid	Santamaria Emory University
Jesse Columbo	Dartmouth-Hitchcock Medical Center
Mark Conant	University of South Florida
Samantha Cox	University of Maryland
Jason Davis	Rutgers University NJMS
Derek de Grijjs	Huntington Memorial Hospital
Neil Desai	Greenville Health System
Suzanne Evans	Bassett Healthcare System
Arash Fereydooni	Yale School of Medicine
Edward Gifford	Mayo Clinic
Oleksiy Gudz	Ivano-Frankivsk National Medical University
Laurel Hastings	Louisiana State University
Caitlin Hicks	Johns Hopkins Univeristy
Courtenay Hoscher	Johns Hopkins University
Nathan Itoga	Stanford University
Benjamin Jordan	Mayo Clinic
Hyein Kim	MedStar Georgetown Univ. Hospital/Washington Hospital Ctr.
Andrew Lee	Greenville Health System
Sara McKeever	University of Arkansas for Medical Sciences
Sesank Mikkilineni	UAMS
Justin Milligan	New Hanover Regional Medical Center
Craig Milner	University of Oklahoma Tulsa
Furqan Muqri	SUNY Upstate Medical University
Melanie Nukala	St. Louis University
Raji Hammed Oladapo	EKSU
Grayson Pitcher	Mayo Clinic
Erion Qaja	Wyckoff Heights Medical Center
Jennifer Sanford	St. Louis University
Samuel Schwartz	Massachusetts General Hospital
Afzal Siddique	Combined Military Hospital
Michele Silvestro	NYU Langone Medical Center
Christian Simmons	University of Arkansas for Medically Sciences
Edvard Skripochnik	Stony Brook University
Allie Sohn	University of South Florida
Kelli Summers	Louisiana State University
Claudiu Vlada	Washington University in Saint Louis
Kenneth Walsh	Rutgers - New Jersey Medical School
S. Keisin Wang	IU School of Medicine
Christopher Yi	Wake Forest University School of Medicine

Newly Elected Associate Members

Melissa Donovan West Palm Beach VA Medical Center

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ARTICLE I – NAME

The name of this organization shall be the "Vascular and Endovascular Surgery Society" (hereinafter the "Society"). Formerly Peripheral Vascular Surgery Society, Established in 1976.

ARTICLE II – OBJECTIVES

The objectives of this Society shall be:

1. To improve the science and art of vascular surgery and endovascular therapies and the interchange of medical knowledge and information thereon;
2. To promote basic and clinical research for improving the quality and safety of vascular surgical and endovascular procedures and vascular care in general;
3. To engage in scientific or educational purposes, and to promote important issues, as the Executive Council, from time to time, may determine to be beneficial to the membership as a whole or to society in general;
4. To provide a forum for the young vascular surgeon, to promote the field of vascular and endovascular surgery through education, scholarship, advocacy, and leadership.
5. To do any and all things which may be necessary or incidental to these Bylaws.

The Society shall carry on activities:

1. As a corporation exempt from Federal income tax under Section 501 (C) (3), of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law), or;
2. As a corporation, contributions to which are deductible under Section 170; Furthermore, no part of the net income of the Society or its property or assets shall at any time inure to the benefit of any individual member, or of any private individual, or be used to promote the candidacy of any person seeking political office.

ARTICLE III – MEMBERSHIP

There shall be six types of membership:

- A. Active
 - B. Active Senior
 - C. Inactive Senior
 - D. Honorary
 - E. Candidate
 - F. Associate
- A. Active membership of this Society shall be limited to physicians of good professional standing who have completed an ACGME-approved vascular surgical residency or fellowship, or equivalent foreign advanced training, who have a sustained major interest and active practice in peripheral vascular surgery and who are certified by the American Board of Surgery or its equivalent. Active members shall be required to pay annual dues. Active members have voting privileges, can serve on committees, sponsor new member applications as well as submit and sponsor papers for presentation at the annual meeting.

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- B. Active senior membership shall be granted to members who have been in practice for greater than 15 years. Active senior members may complete terms of elected office, and are required to pay dues. Active senior members can sponsor papers for fellows and residents, participate in the business meeting as well as vote, but do not present papers and are not eligible for re-election as Society officers.
- C. Inactive senior membership shall be granted to senior members upon receipt of written request. Inactive senior members will no longer receive a subscription to the Journal. Inactive senior members are not required to pay annual dues nor are they allowed to sponsor new member applications or papers and presentations submitted to the Annual Meeting. Inactive senior members may become active senior members by requesting in writing reactivation and paying all back dues or three times the current year's dues.
- D. Honorary membership shall be granted to individuals at the discretion of the Executive Council. Honorary members pay no dues and are not eligible for election as VESS officers.
- E. Candidate membership shall be granted to participants who are in good professional standing in an RRC accredited general surgery, vascular surgery residency, or other vascular residency recognized by the Society. Also students in accredited osteopathic and allopathic medical schools can participate in this membership group. Candidate members must be sponsored by an active or senior active VESS member. Candidate members shall have no voting rights. Candidate members can present papers at the Annual Meeting if sponsored by an active member. Candidate members may be promoted to active membership upon completion of their vascular surgery residency (or equivalent) and upon receipt by the society office of a copy of the vascular surgery training certificate (or equivalent). At this time, the newly promoted active member will be bound by the requirements of active membership in the society.
- F. Associate membership shall be limited to non-vascular trained physicians and surgeons with either an MD or DO degree, scientists active in vascular medicine or surgical research, physician extenders in vascular specialties (RN's, PA's, NP's) and vascular technologists. These members shall pay half dues, have no voting rights, cannot be elected as officers of the society, but may submit abstracts and papers to the meetings.

ARTICLE IV – ELECTION OF MEMBERS

The process of election of active members to the Society shall be as follows:

- 1. Membership enrollment in the Society shall be completed via electronic application through the website.
- 2. Completed applications shall be submitted three months prior to any scheduled business meeting, at which time the candidate shall be considered for election. One letter of recommendation from an active society member is required to complete the application.
- 3. The names of the applicants recommended for membership by the Executive Council shall be submitted to the members at the business meeting.
- 4. Election to membership shall be by secret ballot, by a three-fourths (3/4) affirmative vote of the membership present.
- 5. An applicant who fails to be elected at one meeting may be reconsidered at the next two business meetings of the Society.

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ARTICLE V – DUES AND FEES

Dues and fees shall be levied by the Executive Council and approved by the membership at the Annual Meeting. Any member whose dues remain unpaid for a period of three years shall be dropped from membership, provided that notification of such lapse is given at least three months prior to its effective date. The member may be reinstated on approval of the Executive Council following payment of the dues in arrears.

ARTICLE VI – RESIGNATIONS, EXPULSIONS

1. Resignations of members otherwise in good standing shall be accepted by a majority vote of the Executive Council.
2. Charges of unprofessional or unethical conduct against any member of the Society, if proffered in writing and submitted to the Executive Council, must be acted upon within one year. The Executive Council's concurrence or disallowance of the charges shall be presented to the membership at the Annual Meeting. A three-fourths (3/4) affirmative vote of the members present shall be required for expulsion.

ARTICLE VII – OFFICERS: ELECTIONS AND DUTIES

1. The officers of this Society shall consist of a President, President-Elect, Secretary, Treasurer and Recorder; all to be elected as provided in these Bylaws.
2. The President shall preside at Executive Council meetings and the Annual Meeting. Successors to vacated offices of the Society shall be appointed by the President until the position is filled at the next Annual Meeting.
3. The President and President-Elect of the Society shall be elected for terms of one year each. The Secretary, Treasurer, Recorder and Councilors-At-Large shall be elected for three year terms.
4. The President-Elect, in the absence or incapacity of the President, shall perform the duties of the President's office.
5. In the absence of both the President and President-Elect, the chair shall be assumed by a president pro tem, elected by such members of the Executive Council as are present.
6. The Secretary shall keep minutes at the meetings of the Society and the Executive Council, update the Executive Council on membership database and new applicant files and conduct correspondence of the Society. The Secretary will issue an annual written report at the Annual Meeting.
7. The Treasurer shall receive all monies and funds belonging to the Society, pay all bills, render bills for dues and assessments, and report to the membership at the Annual Meeting. The treasurer will prepare an annual report for audit.
8. The Recorder shall receive all papers presented before the Society. The recorder shall be responsible for assuring prompt editorial review of manuscripts in concert with other Society members.
9. The Councilors-At-Large shall be elected for three-year terms, with election of one councilor occurring annually so as to provide overlapping terms.

ARTICLE VIII – EXECUTIVE COUNCIL

1. There shall be an Executive Council consisting of the President, President- Elect, Secretary, Treasurer, Recorder, Councilors-At-Large, and the two most recent Past Presidents.
2. The Program Committee chairman, the Scholarship Committee chairman, the

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Fundraising Committee chairman, Membership Committee chairman, Bylaws Committee chairman, the Women and Diversity chairman and the Communications Committee chairman shall be non-voting members of the Executive Council.

3. The Executive Council shall be the governing body of the Society and shall have full power to manage and act on all affairs of the Society.
4. Executive Council meetings shall be held at the call of the President of the Society.
5. A majority of the members of the Executive Council shall constitute a quorum for the transaction of business.

ARTICLE IX – COMMITTEES AND REPRESENTATIVES

Standing committees of the Society shall consist of a Nominating Committee, a Program Committee, a Scholarship Committee, a Fundraising Committee, a Bylaws Committee, a Membership Committee, a Women and Diversity Committee and a Communications Committee.

The Nominating Committee shall consist of the current President in office, the President-Elect and the two most recent Past Presidents. Its functions shall be to make up a slate of officers for the Society, and to nominate representatives to affiliated societies to be presented to the Executive Council at the Annual Meeting. The proposed slate shall then be presented for vote during the Annual Member Business Meeting. Representatives shall be appointed by the Nominating Committee in concert with the Executive Council to serve on American College of Surgeons Board of Governors, American College of Surgeons Advisory Council for Surgical Specialties and the Council of the American Association for Vascular Surgery. Each representative shall serve a three-year term unless otherwise noted by the Executive Council at its Annual Meeting. From time to time, other organizations may seek representation from the Society. Additional representatives shall be appointed in the same manner outlined above.

The Program Committees (winter & spring) shall solicit papers and other presentations from members and other individuals and make up the programs for upcoming meetings. The Program Chairs shall be named by the Executive Council and serve a term of two years. Each Committee will consist of six additional society members serving a term of two years each, with three members alternating years to allow for overlap. Program Chairs will be responsible for filling the three empty positions for any given year.

The Scholarship Committee shall consist of six members, a chairman, selected by the Executive Council, three Councilors-At-Large and two remaining At-Large committee members selected by the committee chairman. This committee shall serve for two years. Its function shall be to review educational grant award applications and to report award recipients to the Executive Council at the Annual Meeting.

The Fundraising Committee shall consist of ten members. Its function shall be to research and implement comprehensive fundraising campaigns to support the society, organize and sponsor programs to enhance the awareness and treatment of vascular disease, to evaluate diagnostic and therapeutic tools manufactured by industry, and to enhance the rapid and proficient transfer of new knowledge and techniques to its members with assistance from our industry partners. A committee chairman shall be appointed by the Executive Council at the Annual Meeting to serve a three-year term. The chairman will

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also serve on the Executive Council for the duration of the appointed term. Other committee members shall be the President-Elect, the Treasurer, the Secretary and the newly appointed Councilor-At-Large. The committee chairman will select up to four additional Society members to assist with this task. In addition, the current Society President shall be an ex-officio member.

The Bylaws Committee shall consist of three members to serve overlapping terms of three years each. A new member shall be appointed annually by the Executive Council. The most senior member of the Bylaws Committee shall serve as chair. The Bylaws Committee shall review bylaws from time to time as directed by the Council and when appropriate, make recommendations regarding amendments.

The Membership Development Committee shall consist of four members to serve overlapping terms of four years each. The Secretary shall serve as ex-officio. A new member shall be appointed annually by the Executive Council. The most senior member of the Membership Committee shall serve as chair. The committee shall review all applications and present their nominations for membership to the Executive Council for review and ratification at the Annual Business Meeting. The Committee shall also assist the Secretary with membership development and expansion campaigns.

The Women and Diversity Committee shall consist of four members to serve overlapping terms of four years each. The most senior member shall serve as chair for one year. Open positions shall be appointed by the Executive Council. The purpose of this committee is to identify and promote ways to address minority issues in vascular surgery, and encourage women and minorities to actively participate in the society and its committees.

The Communications Committee shall consist of one chair serving a three year term, and is responsible for organizing, coordinating, and implementing all communication to the membership and along with the Secretary will oversee subcommittee functions. The Communication Chair is appointed by the Executive Council for a maximum three year term renewed annually. The Committee shall consist of three subcommittees:

1. Website subcommittee consisting of one chair serving a two year term and two subcommittee members appointed for two year terms and is responsible for all web-based and electronic communication and maintenance of the Society website.
2. Newsletter subcommittee consisting of one chair serving a two year term and a minimum of two subcommittee members appointed for two year terms and is responsible for a membership newsletter at intervals defined by the Communication Chair.
3. Correspondence subcommittee consisting of one chair serving a two year term and two subcommittee members appointed for two year terms and is responsible for organizing, coordinating and implementing all membership correspondence. All communication subcommittee members shall be appointed by the Executive Council at appropriate intervals and renewed annually.

The Vascular Resident Education Committee shall consist of four members to serve overlapping terms of two years each. Its function shall be to organize and execute the fellows program and the Technology Forum at the VESS Annual Meeting. Two new

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members shall be appointed annually by the Executive Council. The two most senior members of the Vascular Resident Education Committee shall serve as co-chairs. The two out-going co-chairs shall be ex-officio members.

ARTICLE X – MEETINGS

1. The Society shall hold an Annual Meeting, customarily in winter, and held at a time and place selected by the Executive Council.
2. The business meeting of the Society shall be conducted during the Annual Meeting.
3. All active members are encouraged to attend the annual meeting one year out of every three years. There is no attendance requirement for any other member category.
4. Special meetings may be called at any time by the president, or a simple majority of the Executive Council.

ARTICLE XI – QUORUM

The members present at any official meeting of the Society shall constitute a quorum necessary to change the constitution and bylaws of the Society, to make assessments, to authorize appropriations or expenditures of money other than those required in the routine business of the Society, to elect officers and members, and to expel members.

ARTICLE XII – ALTERATIONS, REPEAL

Bylaws may be altered or repealed at the Annual Meeting by a two-thirds (2/3) affirmative vote of the members present.

ARTICLE XIII – PROCEDURE

Proceedings of the Society shall be conducted under Robert's Rules of Order.

Amended – August, 2012

Amended – February 1, 2013

Amended – January 31, 2014

Amended – February 2, 2016



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Member Update Form

Please help the VESS keep your membership information current. We require an email address from all members for communication purposes, as well as your preferred mailing address.

Please return to the VESS Registration Desk or fax to the National Office at 978-927-7872.

MEMBER INFORMATION (Required For All Members)

Name

Institution

City

State

Email Address

MAILING INFORMATION

Preferred Mailing Address: Work Home

Please provide preferred mailing address below:

Mailing Address

Mailing Address (*continued*)

City

State

Postal Code

Country

Daytime Telephone

Thank you!