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Vascular & Endovascular Surgery Society
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2022 - 2023

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Past Presidents & Meetings

Date	Location	President
1976	Chicago, IL	Organizational Meeting
1977	Dallas, TX	Steven M. Dosick
1978	San Francisco, CA	Robert G. Scribner
1979	Chicago, IL	William S. Gross
1980	Chicago, IL	Charles A. Andersen
1981	Dallas, TX	Larry H. Hollier
1982	Boston, MA	G. Edward Bone
1983	San Francisco, CA	Robert C. Batson
1984	Atlanta, GA	Lee C. Bloemendal
1985	Baltimore, MD	George J. Collins, Jr.
1986	New Orleans, LA	Jonathan B. Towne
1987	Toronto, Canada	Thomas S. Riles
1988	Chicago, IL	Paul T. McDonald
1989	New York, NY	Anthony J. Comerota
1990	Los Angeles, CA	John W. Hallett, Jr.
1991	Boston, MA	Paul M. Orecchia
1992	Chicago, IL	David L. Rollins
1993	Washington, DC	Frank T. Padberg, Jr.
1994	Seattle, WA	Peter G. Kalman
1995	New Orleans, LA	William J. Quinones-Baldrich
1996	Chicago, IL	Joseph L. Mills
1997	Boston, MA	Gary Giangola
1998	San Diego, CA	J. Gordon Wright
1999	Washington, DC	Jeffrey R. Rubin
2000	Toronto, Canada	Donald L. Akers, Jr.
2001	Baltimore, MD	Thomas F. Lindsay
2002	Boston, MA	R. Clement Darling, III
2003	Chicago, IL	Jeffrey L. Ballard
2004	Anaheim, CA	Samuel R. Money
2005	Chicago, IL	Lewis B. Schwartz

Past Presidents & Meetings *(continued)*

2006	Philadelphia, PA	Robert A. Cambria
2007	Baltimore, MD	William D. Jordan, Jr.
2008	San Diego, CA	W. Charles Sternbergh, III
2009	Denver, CO	Tina R. Desai
2010	Boston, MA	Karl A. Illig
2011	Chicago, IL	Marc A. Passman
2012	Baltimore, MD	Martin R. Back
2013	Park City, UT	Ruth L. Bush, MD
2014	Steamboat Springs, CO	W. Darrin Clouse
2015	Vail, CO	Vikram S. Kashyap
2016	Park City, UT	Sean P. Roddy
2017	Steamboat Springs, CO	Thomas S. Maldonado
2018	Vail, CO	Peter R. Nelson
2019	Snowbird, UT	Jonathan Eliason
2020	Steamboat Springs, CO	James H. Black
2021	Sun Valley, ID/Virtual	Matthew A. Corriere
2022	Snowmass, CO	Jason T. Lee

Award History

2011

Academic Award—Faculty ..... Guillermo A. Escobar
Academic Award—Fellow ..... Bjoern Suckow
Travel Award ..... Judith C. Lin

2012

Academic Award—Faculty ..... John Curci
Academic Award—Fellow ..... Kathleen Lamb
Travel Award ..... Karen Woo
Norman M. Rich Military Award ..... Cpt. Carole Villamaria

2013

Norman M. Rich Military Award ..... Cpt. Marlin Wayne Causey

2014

Norman M. Rich Military Award ..... Cpt. Daniel Scott
Young Faculty Research Award ..... Dawn M. Coleman

2015

Early Career Faculty Research Award ..... Ryan McEnaney
W. L. Gore Travel Award ..... Matthew Mell

2016

Best Paper Award ..... Diego Ayo
W. L. Gore Travel Award ..... Justin Hurie

2017

Early Career Faculty Award ..... Jean Marie Ruddy
Medtronic Resident Research Award ..... Gayan de Silva
W. L. Gore Travel Award ..... Ying Wei Lum

2018

Early Career Faculty Award ..... Jeffrey Siracuse
Medtronic Resident Research Award ..... Frank Davis
W. L. Gore Travel Award ..... Nicolas Mouawad

Award History *(continued)*

2019

Early Career Faculty Award ..... Andrea Obi
Medtronic Resident Research Award ..... Elizabeth Chou

2020

Early Career Faculty Award ..... Sam C. Tyagi
Medtronic Resident Research Award ..... Christopher Audo
W. L. Gore Travel Award ..... Gregory A. Magee

2021

Early Career Faculty Award ..... Tammy Nguyen
Medtronic Resident Research Award ..... Kenneth Tran
Travel Award ..... Tze-Woei Tan

2022

Best Paper ..... Amir Ghaffarian
BSCI Early Career Investigator Award ..... Katherine Hekman
Medtronic Resident Research Award ..... Kevin Mangum
VESS Resident Research Award ..... Amanda Philips
Travel Award ..... Jonathan Bath

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 **Macdonald Foyer** of the Fairmont Chateau Whistler. Registration hours are as follows:

Thursday, February 23 ..... 7:00 am – 6:00 pm
Friday, February 24..... 6:00 am – 9:30 am / 3:00 pm – 6:30 pm
Saturday, February 25 ..... 6:00 am – 9:30 am / 3:00 – 6:00 pm

SCIENTIFIC SESSIONS

All scientific sessions will be conducted in **Macdonald A/B** at the Fairmont Chateau Whistler unless otherwise noted.

SPEAKER READY AREA

An A/V technician table will be located in the back of the general session hall (Macdonald A/B). A technician will be available during the following hours:

Thursday, February 23 ..... 7:00 am – 6:00 pm
Friday, February 24..... 6:00 am – 9:30 am / 3:00 pm – 6:30 pm
Saturday, February 25 ..... 6:00 am – 9:30 am / 3:00 – 6:00 pm

TECHNOLOGY FORUM

The 2023 Technology Forum will focus on broad vascular pathology and will showcase some of the best that industry has to offer. 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. Note: This program is not eligible for CME credits. The Technology Forum is open to all registered attendees.

DATE: Thursday, February 23, 2023

TIME: 12:30 pm - 3:30 pm

SPECIAL PROGRAMMING

The following programs/courses will be held during the 2023 Annual Meeting:

- Vascular Fellows Program
- Next Generation Medical Student Mentor Program
- General Surgery Resident Vascular Interest Program

Accreditation Information

JOINT ACCREDITATION STATEMENT

In support of improving patient care, this activity has been planned and implemented by Amedco, LLC and the 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.

PHYSICIANS (ACCME) CREDIT DESIGNATION

Amedco, LLC designates this live activity for a maximum of 15.00 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

LEARNING OBJECTIVES

This activity is designed for vascular surgeons and health care workers involved in the management of patients with vascular disease. Upon completion of this course, attendees should be able to:

- Recognize imaging modalities that support use of trans-carotid artery revascularization (TCAR)
- Discuss the conduits that may be used for reconstruction of infected aorto-iliac segments
- Consider employing telehealth vascular consults to increase productivity
- Recognize the impact of socioeconomic deprivation and lower extremity amputation rates
- Discuss the relative benefits of pre-op vein mapping for hemodialysis access
- Consider the thrombotic risk associated with testosterone therapy
  Compare outcomes among open versus endovascular repair of chronic mesenteric ischemia
- Recognize trends in educational values for vascular integrated residents
- Discuss mortality risk based on timing of repair for blunt aortic injuries
- Utilize dynamic imaging to optimize diagnosis of popliteal entrapment syndrome

2023 Sponsors/Exhibits

EXHIBIT HALL

Exhibits by our industry partners will be featured in Macdonald C/D at the Fairmont Chateau Whistler. The VESS asks that members and meeting attendees take some time to visit the exhibits during scheduled exhibit hall hours to acknowledge the generous support of the companies participating in the 2023 Annual Meeting.

SET-UP

Thursday, February 23, 2023	10:00 am – 5:00 pm

SCHEDULED BREAKS IN THE EXHIBIT HALL

Friday, February 24, 2023	6:00 am– 9:30 am 3:00 pm – 6:30 pm
Saturday, February 25, 2023	6:00 am– 9:30 am 3:00 pm – 6:30 pm

TEAR DOWN

Saturday, February 25, 2023	6:30 pm – 9:30 pm

Acknowledgements

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Silk Road Medical
Terumo Aortic
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Notes

Schedule-at-a-Glance

Thursday, February 23, 2023

7:00 am – 5:00 pm	Registration
7:00 am	Continental Breakfast
7:30 am – 12:00 pm	**VASCULAR FELLOW PROGRAM** Moderator: Venita Chandra, MD
7:30 am – 12:00 pm	**GENERAL SURGERY RESIDENT PROGRAM** Moderator: Gabriela Velazquez, MD
7:30 am – 12:00 pm	**MEDICAL STUDENT PROGRAM** Moderator: Max Wohlauer, MD
12:00 pm – 1:00 pm	Lunch Break/Industry Sponsored Fellows Program
12:15 pm – 1:15 pm	**INDUSTRY LUNCH SYMPOSIUM** Supported by: Boston Scientific
1:00 pm - 4:00 pm	**TECHNOLOGY FORUM – DIDACTIC & HANDS-ON** Moderator: Mounir Haurani, MD
4:15 pm – 6:15 pm	**SCIENTIFIC SESSION I** Moderators: Ravi Veeraswamy, MD & Jean Marie Ruddy, MD
4:00 pm – 4:12 pm	1 **Ultrasound Imaging is Sufficient and Axial Imaging is Unnecessary for Patients Undergoing Trans-Carotid Artery Revascularization (TCAR)** Saranya S. Sundaram[1], Ryan W. King[2], Adam Tanious[1], Mathew Wooster[1], Elizabeth Genovese[1], Ravikumar Veeraswamy[1] - [1]Medical University of South Carolina, Charleston, SC; [2]University of Kentucky, Lexington, KY
4:12 pm – 4:24 pm	2 **Determining a Threshold Toe Arm Index for Wound Healing Potential in Patients Undergoing Vascular Intervention** Brian H. Luong, Christina M. Brown, Steven Maximus Mimmie Kwong - U.C. Davis, Sacramento, CA

Schedule-at-a-Glance

4:24 pm – 4:36 pm	3 **Cryopreserved Arterial Allografts Versus Rifampin-Soaked Dacron for the Treatment of Infected Aortic and Iliac Aneurysms** Armin Tabiei, Sebastian Cifuentes, Manju Kalra, Jill J. Colglazier, Bernardo C. Mendes, Melinda S. Schaller, Fahad Shuja, Todd E. Rasmussen, Randall DeMartino - Mayo Clinic, Rochester, MN
4:36 pm – 4:48 pm	4 **Novel Electronic Health Records-Based Consultation Workflow Improves Time to Operating Room for Vascular Surgery Patients in an Acute Setting** John Iguidbashian, Michal Schafer, Kyle Bata, Jeniann Yi - University of Colorado, Aurora, CO
4:48 pm – 4:56 pm	5 (RF) **Outcomes Following Mechanochemical Ablation of the Great and Small Saphenous Veins Based on Diameter** Anna Beth West, Joshua Kim, Ravi R. Rajani, Christopher Ramos, Jaime Benarroch-Gampel - Emory University School of Medicine, Atlanta, GA
4:56 pm – 5:04 pm	6 (RF) **Neutrophil-to-Lymphocyte Ratio is a Superior Prognostic Marker to Frailty in Patients Undergoing Open Lower Extremity Revascularization** Lily S.F. Adler[1], Umin A. Jalloh[1], Khushi S. Patel[1], Emann M. Rabie[1], Anoop Alla[1], Samantha M. Shave[1], Saum A. Rahimi[2], William E. Beckerman[2] - [1]Rutgers Robert Wood Johnson Medical School, Piscataway, NJ; [2]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ
5:04 pm – 5:12 pm	7 (RF) **Post-Operative and Long-Term Outcomes of De Novo Versus Post-Repair Ruptured Abdominal Aortic Aneurysms in VQI-Medicare-Linked Database** Austin Fan, Sina Zarrintan, Kevin Yei, Mahmoud Malas - UC San Diego, La Jolla, CA

Schedule-at-a-Glance

5:12 pm – 5:24 pm	8 **Pre-Operative Anemia is Associated with Poorer Postoperative Outcomes in Patients Undergoing Infrainguinal Bypass Surgery** Young Kim[1], Shiv S Patel[2], Anahita Dua[2], Abhisekh Mohapatra[2] - [1]Duke University, Durham, NC; [2]Massachusetts General Hospital, Boston, MA
5:24 pm – 5:36 pm	9 **Risk Factors for Cerebral Hyperperfusion Syndrome Following Carotid Revascularization** Ashley C. Hsu, Brian Williams, Li Ding, Fred A. Weaver, Sukgu M. Han, Kenneth R. Ziegler, Gregory A. Magee - University of Southern California, Los Angeles, CA
5:36 pm – 5:48 pm	10 **Association between Neighborhood Socioeconomic Deprivation and Likelihood of Lower Extremity Arterial Revascularization Versus Amputation** Oluwasegun A. Akinyemi, Terhas A. Weldeslase, Mallory Williams, Daniel Tran, David Rose, Edward Cornwell, III, Kakra Hughes - 1Howard University College of Medicine, Washington DC, DC
5:48 pm – 6:00 pm	11 **Lower Extremity Extracorporeal Distal Revascularization (LEEDR) in a Swine Model of Prolonged Extremity Ischemia** Joseph Edwards[1], David P Stonko[2], Rebecca Treffalls[1], Eric Lang[1], Hossam Abdou[1], Patrick Walker[1], Brandon Propper[3], Todd Rassmussen[4], Jonathan J. Morrison[1] - [1]R. Adams Cowley Shock Trauma Center, Baltimore, MD; [2]Johns Hopkins Hospital, Baltimore, MD; [3]Uniformed Services University of the Health Sciences, Bethesda, MD; [4]Mayo Clinic, Rochester, MN
6:00 pm – 7:30 pm	**WELCOME RECEPTION** All attendees, guests & exhibitors are welcome.

Schedule-at-a-Glance

Friday, February 24, 2023

6:00 am – 7:00 am	Continental Breakfast in the Exhibit Hall
6:00 am – 9:30 am	Registration
7:00 am – 9:04 am	**SCIENTIFIC SESSION II** Moderators: Roan Glocker, MD & David Kauvar, MD
7:00 am – 7:12 am	12 **Minimum Asymptomatic Carotid Endarterectomy Surgeon and Hospital Volume Cutoffs** Joshua Geiger[1], James Iannuzzi[2], Michael Stoner[1], Adam Doyle[1] - [1]University of Rochester School of Medicine and Dentistry, Rochester, NY; [2]University of California, San Francisco, San Francisco, CA
7:12 am – 7:24 am	13 **Association of Pre- and Peri-Operative Vein Mapping with Hemodialysis Access - Characteristics and Outcomes** Hannah L. Wolf, Charles J. Hillenbrand, IV, Gale J. Tang, Andrew Warren - University of Washington, Seattle, WA
7:24 am – 7:36 am	14 **Single-Site Review of Spinal Cord Protection Protocols Including the Utilization of Spinal Drains Versus Medical Management with Branched Endovascular Aortic Repair** Spencer J. Lucas[1], Kristopher B. Johnson[1], Ryan Rykhus[1], Kirby Hora[1], Angela VandenHull[2], Kari Bates[2], Joni Sengos[2], Patrick W. Kelly[2] - [1]University of South Dakota Sanford School of Medicine, Sioux Falls, SD; [2]Sanford Health, Sioux Falls, SD
7:36 am – 7:48 am	15 **Exogenous Testosterone Replacement Therapy is Associated with Increased Risk for Arterial Graft Infections** Kaohinani J. Longwolf, Cali E. Johnson, Joshua J. Horns, James M. Hotaling, Benjamin S. Brooke - University of Utah, Salt Lake City, UT

Schedule-at-a-Glance

7:48 am – 7:56 am

16 (RF)
Sex-Based Disparities in Major Adverse Limb Events Highest for Femoropopliteal Intervention after Accounting for Presenting Wifi Stage for Chronic Limb Threatening Ischemia
Emanuel A. Jaramillo[1], Katherine M. Sanders[2], Elizabeth M. Lancaster[2], Clara Gomez-Sanchez[2], Jade S. Hiramoto[2], Warren J. Gasper[2], Michael S. Conte[2], James C. Iannuzzi[2] - [1]University of California, San Francisco-East Bay, Oakland, CA; [2]University of California, San Francisco, San Francisco, CA

7:56 am – 8:04 am

17 (RF)
Impact of Direct Factor Xa Inhibitors on the Coagulation Profile and Thrombosis Rate in Patients with Peripheral Artery Disease Following Revascularization
Monica Majumdar[1], Ryan P. Hall[1], Sasha Suraez Ferreira[1], Guillaume Goudot[1], Samual Jessula[1], Lois Owolabi[1], Zachary Feldman[1], Ryan Cassidy[2], Anahita Dua[1] - [1]Massachusetts General Hospital, Boston, MA; [2]Hackensack Meridian School of Medicine, Nutley, NJ

8:04 am – 8:12 am

18 (RF)
Circulating Markers of Matrix Homeostasis are Dysregulated in Hypertension-Induced Aortic Stiffness
Ryan Gedney, Victoria Mattia, Mario Figueroa, Ying Xiong, Rupak Mukherjee, Jeffrey A. Jones, Jean M. Ruddy - Medical University of South Carolina, Mt. Pleasant, SC

8:12 am – 8:24 am

19
Risk of Stroke with Thoracic Endovascular Aortic Repair in the Aortic Arch
Alexander D. DiBartolomeo, Li Ding, Fred A. Weaver, Sukgu M. Han, Gregory A. Magee - University of Southern California, Los Angeles, CA

8:24 am – 8:36 am

20
Survival and Operative Outcomes for Open and Endovascular Repair in Chronic Mesenteric Ischemia
Daniel Lehane, Joshua Geiger, Kshitij Desai, Michael Stoner - University of Rochester School of Medicine and Dentistry, Rochester, NY

Schedule-at-a-Glance

8:36 am – 8:48 am	21 **Pedal Arterial Calcification is Associated with Progression from Transmetatarsal Amputation to Major Amputation Following Infrainguinal Revascularization for Chronic Limb-Threatening Ischemia** Iris H. Liu[1], Bian Wu[2], Rym El Khoury[1], Roberto Ferraresi[3], Alexander M. Reyzelman[1], Warren J. Gasper[1], Jade S. Hiramoto[1], Peter A. Schneider[1], Michael S. Conte[1], Shant M. Vartanian[1] - [1]UCSF, San Francisco, CA; [2]Kaiser Permanente, San Francisco, CA; [3]Clinica San Carlo, Paderno Dugano, Milan, Italy
8:48 am – 8:56 am	22 (RF) **Rectus Sheath Block Improves Patient Recovery Following Open Aortic Surgery** Colin Cleary[1], Ya-Huei Li[2], Akhilesh Jain[3], Pranjali Kainkaryam[4], Parth Shah[3], Thomas Divinagracia[3], James Gallagher III[3], Elizabeth Aitcheson[3], Mouhanad Ayach[3], Kevin Finkel[4], Edward Gifford[3] - [1]University of Connecticut School of Medicine, Farmington, CT; [2]Hartford Hospital, Hartford, CT; [3]Hartford Hospital, Division of Vascular Surgery, Hartford, CT; [4]Integrated Anesthesia Associates, Hartford, CT
8:56 am – 9:04 am	23 (RF) **The Impact of HIV on the Prevalence and Characterization of Peripheral Arterial Disease in Kigali, Rwanda: A Pilot Study** Dominique M. Dockery[1], Sai Allu[1], Samuel Nussenzweig[1], Aron H. Licht[1], Ryan Cunningham[1], Jeffrey Slaiby[2], Kyle Denison Martin[3], Carla C. Moreira[2], Robert B. Patterson[3] - [1]Warren Alpert Medical School of Brown University, Providence, RI; [2]Rhode Island Hospital, Providence, RI; [3]Alpert Medical School of Brown University, Providence, RI
9:15 am – 10:15 am	**OBL SESSION** Moderators: Todd Berland, MD & Alissa Hart, MD
3:00 pm	Registration Re-Opens
3:00 pm – 4:00 pm	Coffee/Snacks/Visit Exhibitors

Schedule-at-a-Glance

3:00 pm – 4:00 pm	**VASCULAR EDUCATION SESSION** Moderators: Gabriela Velazquez, MD & Kedar Lavingia, MD
3:00 pm - 3:12 pm	E1 **Individual and Program-Related Predictors of Academic Vascular Surgery Practice** Andrea Tess Fisher[1], Arash Fereydooni[1], Danielle M. Mullis[1], Brigitte K. Smith[2], Michael D. Sgroi[1] - [1]Stanford University, Stanford, CA; [2]University of Utah, Salt Lake City, UT
3:12 pm - 3:24 pm	E2 **General Surgery Residents are Still Interested in Vascular Surgery** M. Libby Weaver[2], Gabriella Velazquez Ramirez[3], Peter Nelson[1], Kimberly Zamor[1], William Jennings[1], Kelly Kempe[1] - [1]University of Oklahoma School of Community Medicine, Tulsa, OK; [2]University of Virginia School of Medicine, Charlottesville, VA; [3]Wake Forest School of Medicine, Winston-Salem, NC

Schedule-at-a-Glance

3:24 pm - 3:36 pm

E3

Fourth Year Medical Students' Perceptions of Vascular Surgery: Can We Improve the Pipeline?

Tyler Arismendi[1], Nicholas Schaper[1], Saideep Bose[1], Konstantinos C Karabetsos[2], Ali Syed[2], Rheyana Branch[3], Marvi Moreno[4], Cole Pickney[5], Ikpechukwu Obayi[6], Spencer J Lucas[7], Eduardo González[8], Aaron Graves[9], Brittany Kauffman[10], Alexandra Maningat[11], Tara Zielke[12], Janice Nam[12], Michael Soult[12], Faisal Aziz[13], Matthew R. Smeds[1] - [1]Saint Louis University School of Medicine, Saint Louis, MO; [2]Medical College of Wisconsin, Milwaukee, WI; [3]University of Louisville School of Medicine, Louisville, KY; [4]Kirk Kerkorian School of Medicine at the University of Nevada, Las Vegas, NV; [5]Case Western Reserve University School of Medicine, Cleveland, OH; [6]City University of New York (CUNY) School of Medicine, New York, NY; [7]University of South Dakota Sanford School of Medicine, Vermillion, SD; [8]Universidad Central del Caribe, Bayamón, PR; [9]Kansas City University College of Osteopathic Medicine, Kansas City, MO; [10]Arkansas College of Osteopathic Medicine, Fort Smith, AR; [11]University of the Incarnate Word School of Osteopathic Medicine, San Antonio, TX; [12]Loyola University Chicago Stritch School of Medicine, Maywood, IL; [13]Penn State College of Medicine, State College, PA

3:36 pm - 3:48 pm

E4

Patterns in Complex Aortic Vascular Surgery Training

Nallely Saldana-Ruiz, Osarumen Okunbor, Betka Douglas, Matthew Smith, Elina Quiroga, Niten Singh, Sara L Zettervall - University of Washington, Seattle, WA

Schedule-at-a-Glance

4:00 pm – 6:00 pm	**SCIENTIFIC SESSION III** Moderators: Jordan Stern, MD & Yazan Duwayri, MD
4:00 pm – 4:12 pm	24 **5-Year Outcomes of Elective Endovascular Versus Open Repair of Popliteal Artery Aneurysms in the VISION Database** Keyuree Satam[1], Anand Brahmandam[1], Xinyan Zheng[2], Jialin Mao[2], Raul J Guzman[1], Philip Goodney[3], Cassius I. Ochoa Chaar[1] - [1]Yale School of Medicine, New Haven, CT; [2]Weill Cornell Medicine, New York, NY; [3]Dartmouth-Hitchcock Medical Center, Lebanon, NH
4:12 pm – 4:24 pm	25 **Implementation of Quality Improvement Protocol to Decrease Length of Stay after Elective Carotid Endarterectomy** Zach M. Feldman, Srihari Lella, Sujin Lee, Anahita Dua, Sunita D. Srivastava, Matthew J. Eagleton, Glenn M. LaMuraglia, Nikolaos Zacharias - Massachusetts General Hospital, Boston, MA
4:24 pm – 4:36 pm	26 **Effects of Timing of Repair on Mortality Following Thoracic Endovascular Aortic Repair for Blunt Thoracic Aortic Injury** Charles S. Marquardt, Saideep Bose, Matthew R. Smeds - Saint Louis University Hospital, Saint Louis, MO
4:36 pm – 4:48 pm	27 **Precocious Rupture of Abdominal Aortic Aneurysms Below Size Criteria for Repair: Risk Factors and Outcomes** Elizabeth L. George[1], Justin A. Smith[2], Benjamin Colvard[2], Jason T. Lee[1], Jordan R. Stern[1] - [1]Stanford University, Stanford, CA; [2]Harrington Heart and Vascular Institute, University Hospitals Cleveland Medical Center, Cleveland, OH

Schedule-at-a-Glance

4:48 pm – 4:56 pm

28 (RF)
Utilizing Mobile Diabetic Foot Clinics to Provide Comprehensive Care to Patients Experiencing Homelessness
Kris M. Boelitz[1], Jaeyoung Lee[1], Colby Cayton[2], Mallory Gibbons[3], Jessin Varghese[1], Frances Lagana[1], Shahida Balaparya[1], Kavita Babu[1], Jessica P. Simons[1], Douglas W. Jones[1], Andres Schanzer[1], Tammy T Nguyen[1] - [1]University of Massachusetts Medical School, Worcester, MA; [2]Maine Medical Center, Portland, ME; [3]Vascular Care Group, Worcester, MA

4:56 pm – 5:04 pm

29 (RF)
Intraoperative Infusion of Dextran Confers No Additional Benefit after Carotid Endarterectomy but is Associated with Increased Major Adverse Cardiac Events
Jessica M. Moore[1], Karan Garg[2], Igor Laskowski[3], Thomas Maldonado[2], Romeo Mateo[3], Sateesh Babu[3], Arun Goyal[3], Daniel Ventarola[3], Heepeel Chang[3] - [1]New York Medical College, Valhalla, NY; [2]NYU Langone Medical Center, New York, NY; [3]Westchester Medical Center, New York Medical College, Valhalla, NY

5:04 pm – 5:12 pm

30 (RF)
Renal Disease and Congestive Heart Failure are Risk Factors for Urgent Endovascular Repair in Patients Under Active Surveillance for Thoracic and Thoracobdominal Aortic Aneurysms
Jonathan R. Krebs, Brian Fazzone, Erik M. Anderson, Walker Ueland, John R. Spratt, Martin R. Back, Zain Shahid, Gilbert R. Upchurch, Jr., Michol A. Cooper - University of Florida, Gainesville, FL

5:12 pm – 5:24 pm

31
Sirolimus Coated Balloon for Femoropopliteal and Below the Knee Disease: Xtosi Trial 24-Month Results
Edward Tieng Chek Choke, Hao Yun Yap, Tze Tec Chong - Sengkang General Hospital, Singapore, Singapore

Schedule-at-a-Glance

5:24 pm – 5:36 pm	32 **Outcomes of Transcarotid Artery Revascularization Stratified by Institutional Designation: Academic vs. Community Hospitals** Samuel D. Leonard[1], Regina D. Husman[1], Tommaso Cambiaghi[1], Kourosh Keyhani[1], Arash Keyhani[1], Raghu Motaganahalli[2], Andres Fajardo[2], Shihuan K. Wang[1] - [1]UT Houston Medical School, Houston, TX; [2]Indiana University School of Medicine, Indianapolis, IN
	33 *Moved to Case Report Session (Now CR7)*
5:36 pm – 5:48 pm	34 **Vascular Surgery in Low- and Middle-Income Countries: A State-of-the-Art Review** Nissma Bencheikh, Sina Zarrintan, Omar Al-Nouri, Mahmoud Malas, Ann C. Gaffey - University of California San Diego, La Jolla, CA
6:00 pm	**VESS MEMBER BUSINESS MEETING**
6:00 pm – 7:00pm	**CASE REPORT SESSION (Reception)** Moderators: Greg Magee, MD & M. Libby Weaver, MD
6:00 pm – 6:10 pm	CR1 **A Rare of Case Klippel-Trenaunay Syndrome and Inferior Vena Cava Aneurysm: When is Surgical Management Appropriate?** Jeffrey D. Crawford[1], Reid Mahoney[2], Wyatt Rodan[3], Matthew Studer[1], Judah Gold-Markel[1], Atish Chopra[4] - [1]Legacy Health, Portland, OR; [2]Oregon Health and Sciences University, Portland, OR; [3]Oregon Health and Sciences University, Portland, OR; [4]Fort Worth, Fort Worth, TX
6:10 pm – 6:20 pm	CR2 **Heparin-Induced Thrombocytopenia Associated with a Heparin-Bonded Stent: A Novel Stent-Preserving Strategy** C. Y. Maximilian Png, John Schell, Alyssa M. Flores, Rebecca K. Leaf, Walter Dzik, Abhisekh Mohapatra - Massachusetts General Hospital, Boston, MA

Schedule-at-a-Glance

6:20 pm – 6:30 pm	CR3 **Adjunctive Hemostatic and Resuscitative Techniques to Facilitate Hemipelvectomy for Parkes-Weber Syndrome** Claire E. Cassianni[1], Peter S. Rose[2], Nolan C. Cirillo-Penn[2], Stephanie F. Heller[2], Waleed Gibreel[2], Jill J. Colglazier[2] - [1]Mayo Clinic Alix School of Medicine, Rochester, MN; [2]Mayo Clinic, Rochester, MN
6:30 pm – 6:40 pm	CR4 **Staged, Hybrid Repair of Bilateral Common Femoral, Profunda, Superficial Femoral, and Popliteal Artery Aneurysms** Megan J. Lenihan, Xuan-Binh D. Pham - 1Swedish Medical Center, Seattle, WA
6:40 pm – 6:50 pm	CR5 **Undifferentiated Pleomorphic Sarcoma of the Venous System: An Extremely Rare Finding** Adam Beyer, Kedar S. Lavingia, Michael Amendola, Diana Otoya - Virginia Commonwealth University, Richmond, VA
6:50 pm – 7:00 pm	CR6 **Hybrid Repair of an Innominate Artery Pseudoaneurysm after Blunt Traumatic Injury in a Bovine Arch** Sabina M. Sorondo[1], Keyuree Satam[2], Michael J. Paisley[1], Venita Chandra[1] - [1]Stanford Health Care, Palo Alto, CA; [2]Yale School of Medicine, New Haven, CT
7:00 pm – 7:10 pm	CR7 **Open Repair of a Rapidly Expanding Renal Artery Stump Aneurysm Following Radical Nephrectomy: Case Report** Christopher DeHaven, Leana Dogbe, Faisal Aziz - Penn State College of Medicine, Hershey, PA

Schedule-at-a-Glance

Saturday, February 25, 2023

6:00 am – 7:00 am	Continental Breakfast in the Exhibit Hall
6:00 am – 9:30 am	Registration
7:00 am – 9:00 am	**SCIENTIFIC SESSION IV** Moderators: Max Wohlauer, MD & Jeniann Yi, MD
7:00 am – 7:12 am	35 **Association of Baseline Chronic Kidney Disease Stage with Short and Long-Term Survival and Technical Outcomes after FEVAR** Shernaz S. Dossabhoy, Sabina M. Sorondo, Andrea T. Fisher, Vy T. Ho, Jordan R. Stern, Jason T. Lee - Stanford University, Palo Alto, CA
7:12 am – 7:24 am	36 **The Effects of Plavix Duration on Carotid Artery In-Stent Restenosis** Christine Jokisch, Chetan Dargan, Haroon Janjua, James Brooks, Neil Moudgill, Murray Shames - University of South Florida, Tampa, FL
7:24 am – 7:36 am	37 **Defining Vascular Deserts to Describe Access to Care and Identify Sites for Targeted Limb Preservation Outreach** Kathryn DiLosa, Ryan Khoa Nguyen, Christina Brown, Aidan Waugh, Mimmie Kwong, Misty D. Humphries - UC Davis, Sacramento, CA
7:36 am – 7:48 am	38 **Expected Post-Operative Duplex Ultrasound Characteristics of Distal Revascularization and Interval Ligation** Alexis Graham[1], M. Libby Weaver[2], Courtenay Holscher[1], Thomas Reifsnyder[3] - [1]Johns Hopkins Hospital, Baltimore, MD; [2]University of Virginia, Charlottesville, VA; [3]Johns Hopkins Bayview Hospital, Baltimore, MD

Schedule-at-a-Glance

7:48 am – 7:56 am	39 (RF) **Using the Vascular Quality Initiative to Show Upper Extremity Access for Complex Aortic Aneurysm Repairs is Associated with Worse Perioperative Outcomes** Rohini J. Patel, Asma Mathlouthi, Kevin Yei, John S. Lane, Omar Al-Nouri, Mahmoud B. Malas, Andrew R. Barleben - University of California San Diego Health System, San Diego, CA
7:56 am – 8:04 am	40 (RF) **Higher Carotid Bulb Distension Index Correlates with Increased Hypotension & ICU Utilization after Transcarotid Artery Revascularization (TCAR)** Kshitij Anil Desai, Justin Weissberg, Samuel Florentino, Michael Stoner, Leanne Grafmuller, Daniel Lehane - University of Rochester Medical Center, Rochester, NY
8:04 am – 8:12 am	41 (RF) **Differences in Long-Term Outcomes in End-Stage Kidney Disease Patients with Chronic Limb-Threatening Ischemia** Stephanie Lynn Rakestraw, Zdenek Novak, Michael Y. Wang, Emily L. Spangler, Emily B. Levitan, Jayme E. Locke, Adam W. Beck, Danielle C. Sutzko - UAB, Birmingham, AL
8:15 am – 9:00 am	**AWARD SESSION** (7-minute presentations) Moderator: Benjamin Brooke, MD & Ravi Veeraswamy, MD **UPDATE FROM 2020 AWARD WINNER** **Travel Award:** Gregory Magee, MD **UPDATE FROM 2022 AWARD WINNERS** **Travel Award:** Jonathan Bath, MD **Medtronic Resident Research Award:** Kevin Magnum, MD **Resident Research Award:** Amanda Philips, MD **BSCI Early Career Investigator Award:** Katherine Hekman, MD

Schedule-at-a-Glance

	2023 AWARD WINNERS ANNOUNCEMENT Travel Award Medtronic Resident Research Award BSCI Early Career Faculty Award
9:00 am – 9:15 am	**INTRODUCTION OF THE PRESIDENT** Mark Conrad, MD
9:15 am – 10:00 am	**PRESIDENTIAL ADDRESS** Ravi Veeraswamy, MD
10:15 am – 11:15 am	**ROUND TABLE DISCUSSION** **"Should I Stay or Should I Go?"** Moderators: Bjoern D. Suckow, MD
3:00 pm	Registration Re-Opens
3:00 pm – 4:00 pm	Coffee/Snacks/Visit Exhibitors
4:00 pm – 6:00 pm	**SCIENTIFIC SESSION V** Moderators: Michael Soult, MD & John Harlock, MD
4:00 pm – 4:12 pm	42 **Dynamic Imaging is the Ideal Modality for the Diagnosis of Popliteal Artery Entrapment Syndrome** Amir Ghaffarian, Benjamin Starnes, Elina Quiroga, Nam Tran, Niten Singh - University of Washington, Seattle, WA
4:12 pm – 4:24 pm	43 **Outcomes of Aortobifemoral Bypass Based on Configuration of the Proximal Anastomosis** Sahaj Shah, Gayatri Pillai, Benjamin A. Greif, Evan J. Ryer, James R. Elmore, Gregory G. Salzler - Geisinger Medical Center, Danville, PA

Schedule-at-a-Glance

4:24 pm – 4:36 pm	44 **Type IV Hypersensitivity Reaction after Cyanoacrylate Venous Closure** Leigh Ann O'Banion[1], Amna Ali[1], Mariya Kochubey[1], Yueqi Yan[2], Joshua Fallentine[3], Jae Hak Oh[3], Harik R. Patel[4], Michael Y. Shao[5], Nishant Agrawal[6], Emely Carmona[6], Eric S. Hager[6], Misaki Kiguchi[7] - [1]UCSF Fresno, Fresno, CA; [2]UC Merced, Merced, CA; [3]Georgetown University School of Medicine, Washington DC; [4]St. George's University of London, Chicago, IL; [5]Northshore University Health System, Chicago, IL; [6]University of Pittsburgh Medical Center, Pittsburgh, PA; [7]MedStar Washington Hospital Center, Washington DC
4:36 pm – 4:44 pm	45 (RF) **Median Arcuate Ligament Syndrome: A Video Case Report** C.J. Hillenbrand, Benjamin Starnes, Niten Singh - University of Washington, Seattle, WA
4:44 pm – 4:52 pm	46 (RF) **Outcomes of Open Mesenteric Bypass for Chronic Mesenteric Ischemia among Elderly Patients** Chris Jacobs, Salvatore Scali, Brian Fazzone, Amanda Filiberto, Erik Anderson, Jonathan Krens, Martin Back, Zain Shahid, Gilbert Upchurch, Thomas Huber - University of Florida, Gainesville, FL
4:52 pm – 5:04 pm	47 **Characteristics and Outcomes of Patients Undergoing Infrainguinal Bypass in the Endovascular Era** Randall Bloch, Erin McIntosh, Frank Pomposelli, Scott Prushik, Katie Shean, Mark Conrad - St. Elizabeth's Medical Center, Boston, MA
5:04 pm – 5:12 pm	48 (RF) **Predictors of Arteriovenous Fistula Maturation among Patients with Severe Obesity** Laura C. Anderson, Larry W. Kraiss, Mark R. Sarfati, Julie B. Hales, Benjamin S. Brooke - University of Utah, Salt Lake City, UT

Schedule-at-a-Glance

5:12 pm – 5:24 pm	49 **TEVAR Acutely Increases Left Ventricular Work in an Animal Model** David P. Stonko, Joseph Edwards, Hossam Abdou, Patrick Walker, Rebecca N. Treffalls, Randall R. DeMartino, Bernardo C. Mendes, Caitlin W. Hicks, Jonathan J. Morrison - Johns Hopkins, Baltimore, MD
5:24 pm – 5:36 pm	50 **Industry Funding Negatively Impacts Publication of Vascular Surgery Trials** Mary A. Binko, Katherine Reitz, Rabih A. Chaer, Edith Tzeng, Mohammad H. Eslami, Natalie D. Sridharan - University of Pittsburgh, Pittsburgh, PA
5:36 pm – 5:48 pm	51 **Insulin Dependence is Associated with Poor Long-Term Outcomes but Equivalent Perioperative Outcomes Following AAA Repair** Clay P. Wiske[1], Caron Rockman[1], Virendra Patel[2], Neal Cayne[1], Glenn Jacobowitz[1], Karan Garg[1] - [1]New York University, New York, NY; [2]Columbia University, New York, NY
5:48 pm – 5:56 pm	52 (RF) **Use of Direct Oral Anticoagulants Over Warfarin Improves Survival and Patency in Infra-Geniculate Bypasses with Vein Conduit Compared to Prosthetic** David P. Ebertz[1], Saideep Bose[2], Benjamin Colvard[1] - [1]University Hospitals - Case Western Reserve University, Cleveland, OH; [2]Saint Louis University, St Louis, MO
5:56 pm – 6:04 pm	53 (RF) **Outcomes of Patients Treated for Complex Abdominal Aortic Aneurysms Using Fenestrated Grafts with a Double-Wide Scallop for Celiac Artery Incorporation** Nolan C. Cirillo-Penn[1], Emanuel R. Tenorio[2], Randall R. DeMartino[1], Gustavo S. Oderich[2], Bernardo C. Mendes[1] - [1]Mayo Clinic, Rochester, MN; [2]University of Texas Health Science Center at Houston, Houston, TX
7:00 pm – 10:00 pm	**PRESIDENT'S DINNER** *Tickets Required*

Notes

Full Program & Abstracts

Thursday, February 23, 2023

7:00 am – 5:00 pm	Registration
7:00 am	Continental Breakfast
7:30 am – 12:00 pm	**VASCULAR FELLOW PROGRAM** Moderator: Venita Chandra, MD
7:30 am – 12:00 pm	**GENERAL SURGERY RESIDENT PROGRAM** Moderator: Gabriela Velazquez, MD
7:30 am – 12:00 pm	**MEDICAL STUDENT PROGRAM** Moderator: Max Wohlauer, MD
12:00 pm – 1:00 pm	Lunch Break/Industry Sponsored Fellows Program
12:15 pm – 1:15 pm	**INDUSTRY LUNCH SYMPOSIUM** Supported by: Boston Scientific
1:00 pm - 4:00 pm	**TECHNOLOGY FORUM – DIDACTIC & HANDS-ON** Moderator: Mounir Haurani, MD
4:15 pm – 6:15 pm	**SCIENTIFIC SESSION I** Moderators: Ravi Veeraswamy, MD & Jean Marie Ruddy, MD
4:00 pm – 4:12 pm	1 **Ultrasound Imaging is Sufficient and Axial Imaging is Unnecessary for Patients Undergoing Trans-Carotid Artery Revascularization (TCAR)** Saranya S. Sundaram[1], Ryan W. King[2], Adam Tanious[1], Mathew Wooster[1], Elizabeth Genovese[1], Ravikumar Veeraswamy[1] - [1]Medical University of South Carolina, Charleston, SC; [2]University of Kentucky, Lexington, KY

INTRODUCTION AND OBJECTIVES: Ultrasound is frequently used to determine the degree of carotid stenosis. Axial imaging is often additionally obtained for operative TCAR planning. We examined if ultrasound alone is sufficient for operative planning prior to TCAR.

METHODS: Data was obtained from the Vascular Quality Initiative TCAR Surveillance Project registry between 2016 and 2021. Patients were segregated into those with preoperative ultrasound alone (US) versus those with additional axial imaging (AX). Peri-operative outcomes were compared utilizing chi-squared analysis and independent sample t-tests.

RESULTS: 3,418 patients were identified; 682 were designated to US group and 2736 to AX group. Pre-operative hypertension was more prevalent in the US group ($p<0.001$) while coronary artery disease and prior ipsilateral TIA/ stroke in the AX group ($p=0.002$). Interestingly, there was an increased prevalence of prior ipsilateral carotid endarterectomy (CEA, $p<0.035$) and stenting (CAS, $p=0.008$) in the US group. Pre-operative creatinine was lower in the AX group (1.08+/-0.01 vs. 1.18+/-0.49, $p<0.001$). Symptomatic patients were more prevalent in the AX group ($p<0.001$). No significant difference was noted between the groups in percent stenosis measured on pre-operative duplex, lesion characteristics, use of pre/post-dilation, number of stents placed, total contrast usage, or fluoroscopy time. There was a slight increase in the total procedure time for the AX group (73.7+/-29.1 vs. 68.6+/-32.8 min, $p=0.017$). No difference existed between groups for peri-operative TIA/stroke, technical complications, or death.

CONCLUSIONS: Sole use of duplex ultrasound is safe and effective in pre-operative planning for TCAR. No significant differences in use of intra-operative resources or post-operative complications were noted compared to additional axial imaging. Abrogation of CTA/MRA can offer financial savings and streamline clinical workflow while maintaining quality outcomes.

4:12 pm – 4:24 pm

2

Determining a Threshold Toe Arm Index for Wound Healing Potential in Patients Undergoing Vascular Intervention

Brian H. Luong, Christina M. Brown, Steven Maximus Mimmie Kwong - U.C. Davis, Sacramento, CA

INTRODUCTION AND OBJECTIVES: The Society for Vascular Surgery (SVS) recommends use of vascular lab evaluation to follow perfusion after revascularization for chronic limb threatening ischemia (CLTI). However, the value of toe arm index (TAI) as an indicator of healing potential in patients with lower extremity wounds has not been well established.

METHODS: A retrospective review was performed of vascular patients with lower extremity wounds that underwent peripheral vascular intervention between 2014-2019. Patient demographics, comorbidities, TAI, and SVS WIfI score were collected. Associations between patient variables and wound healing at various time points were evaluated.

RESULTS: A total of 173 patients (67.7±10.9 years old; 71.1% male) were identified with lower extremity wounds. Mean preoperative TAI was 0.21±0.16 and mean SVS WIfI score was 3±1. Most patients underwent endovascular intervention (77.5%). Patients were followed for a median of 416 (IQR 129-900) days. The mean postoperative TAI was 0.36±0.20. Nine percent (15) healed within 1 month of revascularization without need for major amputation, while 44.8% (69) healed within 6 months, and 65.5% (97) healed within 1 year. Those that healed within 1 year without major amputation did not differ from those that did not heal based on age, gender, race, comorbidities, medications, or procedures performed. However, patients that healed without major amputation had a higher postoperative TAI (0.38 versus 0.30, p=.03). This was similar in the subset of patients with diabetes (0.37 in healed versus 0.28 in non-healed, p=.01). A TAI value of 0.30 optimized sensitivity and specificity for wound healing.

CONCLUSIONS: Over half of patients healed without major amputation by 1 year after revascularization despite high initial WIfI scores and poor preprocedural perfusion status. The TAI value of 0.30 may be a clinically important threshold to identify wound healing potential in patients with CLTI.

Full Program & Abstracts

4:24 pm – 4:36 pm

3

Cryopreserved Arterial Allografts Versus Rifampin-Soaked Dacron for the Treatment of Infected Aortic and Iliac Aneurysms

Armin Tabiei, Sebastian Cifuentes, Manju Kalra, Jill J. Colglazier, Bernardo C. Mendes, Melinda S. Schaller, Fahad Shuja, Todd E. Rasmussen, Randall DeMartino - Mayo Clinic, Rochester, MN

INTRODUCTION: Infected aortic and iliac aneurysms are difficult to treat. We sought to compare cryopreserved arterial allografts (CAAs) and rifampin-soaked dacron (RSD) for in-situ reconstruction.

METHODS: This is a single center retrospective review of all infected iliac, abdominal and thoracoabdominal aortic aneurysms treated with CAAs or RSD between 2002-2022. Diagnosis was confirmed by intraoperative, radiologic or microbiological evidence of aortic infection. Perioperative events, 30-day and long-term mortality, reinfection and reintervention were assessed.

RESULTS: Thirty patients (17 CAA, 13 RSD) with mean age of 61 and 69 years, respectively, were identified. The infected aneurysm was most commonly juxta-or infrarenal (Table). Overall post-operative morbidity was 41% vs. 54% for CAA and RSD groups respectively (p=0.71). 30-day/in-hospital mortality was 12% in the CAA group vs. 23% in RSD group (p=0.63). Median follow-up was longer for RSD group (10 months vs. 7 months). Cumulative survival at 1 and 3-years in the CAA group was 80.8% and 64.8% vs. 69.2% and 69.2% in the RSD group (p=0.70). Four patients in the CAA group underwent reinterventions for graft occlusion (2), multiple pseudoaneurysms and reinfection (1) and hemorrhagic shock caused by graft rupture (1). Freedom from reintervention at 1 and 3- years was 88% and 79.5% (CAA group) vs 100% and 100% (RSD, p=0.07). Freedom from reinfection at 1-year was 100% in both groups while at 3-years was 90.9% for CAA group and 100% for RSD group (p=0.46).

CONCLUSIONS: Infected aortic and iliac aneurysms have a high early morbidity and mortality. Although limited, in our series both CAA and RSD had similar outcomes, while CAA trended towards higher reintervention rates. Both remain viable options for complex scenarios but require close surveillance.

Table.

Variable	*Cryopreserved arterial allograft No. or mean ± SD*	*Rifampin-soaked dacron No. or mean ± SD*	*P-value*
Total	17	13	
Male	8 (47)	9 (69)	.28
Age, years	61 ± 10	68 ± 14	.14
Positive preoperative bloodstream	10 (59)	6 (46)	.71
Antibiotic preoperative treatment	13 (76)	5 (38)	.06
Urgency of surgery			
Urgent	2 (12)	5 (38)	.19
Emergent	11 (65)	6 (46)	.46
Elective	4 (24)	2 (15)	.67
Aneurysm location			
Thoracoabdominal	1 (6)	1 (8)	> .99
Paravisceral	7 (41)	1 (8)	.09
Suprarenal	1 (6)	0	> .99
Juxtarenal	2 (12)	3 (23)	.63
Infrarenal	4 (24)	8 (62)	.14
Common iliac artery	1 (6)	0	> .99
External iliac artery	1 (6)	0	> .99
Postoperative hospital stay	12 ± 10	8 ± 4	.16
Any postoperative complication	7 (41)	7 (54)	.71
30 day/in hospital mortality	2 (12)	3 (23)	.63

4:36 pm – 4:48 pm

4

Novel Electronic Health Records-Based Consultation Workflow Improves Time to Operating Room for Vascular Surgery Patients in an Acute Setting

John Iguidbashian, Michal Schafer, Kyle Bata, Jeniann Yi - University of Colorado, Aurora, CO

INTRODUCTION AND OBJECTIVES: Inefficient clinical workflows can have downstream effects of increased costs, poor resource utilization, and worse patient outcomes. The surgical consultation process can be complex with unclear communication, potentially delaying care for patients requiring time-sensitive intervention in an acute setting. A novel electronic health records (EHR)-based workflow was implemented to improve the consultation process. Post-implementation, we assessed the impact of this initiative in patients requiring vascular surgery consultation.

METHODS: An EHR-driven consultation workflow was implemented at a single institution, standardizing the process across all consulting services. This order-initiated workflow automated notification to providers of consult requests, communication of patient data, patient addition to consultants' lists, and tracking consult completion. Pre-implementation (1/1/2021-1/31/2022) and post-implementation (2/1/2022-8/20/2022) vascular surgery consultation cohorts were compared to evaluate the impact of this initiative on timeliness of care using the independent two-tailed t-test.

RESULTS: There were 278 inpatient and emergency department vascular surgery consultations (158 pre-implementation, 120 post-implementation); 41 and 38 consults required surgery pre- and post-implementation, respectively. The novel workflow resulted in a viewable consult note 31.77 minutes earlier than pre-implementation (95% CI: 8.13-55.41, p=0.009). Attending attestations outlining final treatment plans were added 205.65 minutes sooner post-implementation (95% CI 83.72-327.57, p=0.001). Furthermore, vascular surgery patients requiring surgery were transported to the operating room 286.64 minutes sooner post-implementation (95% CI: 22.53-550.76, p=0.034) - a 47% reduction from pre-implementation. There were no differences in procedure duration, post-operative disposition, or intra-operative complication rates.

CONCLUSIONS: We implemented a novel workflow utilizing the EHR to standardize and automate the consultation process in acute, time-sensitive settings. This institutional initiative significantly improved timeliness of care for vascular surgery patients, including decreased time to operation. EHR-based innovations can be further disseminated to other institutions, representing a powerful tool to increase the value of care in vascular surgery.

4:48 pm – 4:56 pm

5 (RF)

Outcomes Following Mechanochemical Ablation of the Great and Small Saphenous Veins Based on Diameter

Anna Beth West, Joshua Kim, Ravi R. Rajani, Christopher Ramos, Jaime Benarroch-Gampel - Emory University School of Medicine, Atlanta, GA

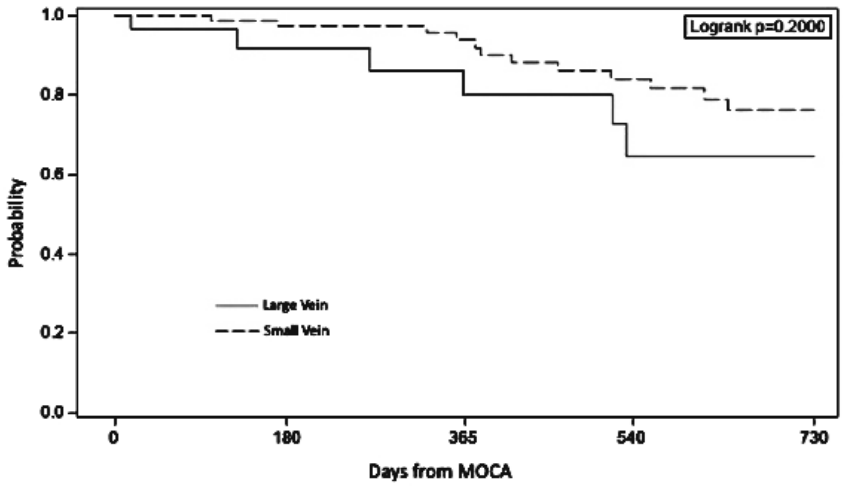
INTRODUCTION AND OBJECTIVES: Large vein diameter is associated with higher recanalization rates after thermal ablation procedures of the great and small saphenous veins. However, no studies have evaluated outcomes with respect to vein diameter after mechanochemical ablation (MOCA).

METHODS: A retrospective chart review of patients with venous insufficiency who underwent MOCA of the great or small saphenous vein from 2017-2021 was conducted. Patients with no follow up ultrasound were excluded. Patients were classified as having a large (≥1cm) or small (<1cm) treated vein. The primary outcomes were 2-year recanalization and reintervention of the treated segment.

RESULTS: A total of 186 patients underwent MOCA during the study period. There was no difference in age, gender, history of venous thromboembolic events, use of anticoagulation, previous vein treatment, or length of treated segment. Patients with large veins were less likely to have stasis ulcers compared to those with small veins (4.8% vs. 22.9%; p=.008). Patients with large veins had a higher incidence of postoperative pain (11.9% vs. 2.1%; p=0.1) but no difference in other local complications (hematoma, hyperpigmentation, burning sensation, nerve damage, and endovenous heat induced thrombosis). At 2 years, there was no significant difference between large and small veins with regard to recanalization (14.3% vs 8.3%; p=.24 - Figured) or reintervention (4.8% vs. 2.1%; p=.3) of the treated segment.

CONCLUSIONS: Unlike with thermal ablation, large vein diameter is not associated with a difference in recanalization following MOCA of the great and small saphenous veins. Thus, this technique should be considered in the treatment of patients with larger vein diameters.

Figure. Two-Year Recanalization



Full Program & Abstracts

4:56 pm – 5:04 pm

6 (RF)

Neutrophil-to-Lymphocyte Ratio is a Superior Prognostic Marker to Frailty in Patients Undergoing Open Lower Extremity Revascularization

Lily S.F. Adler[1], Umin A. Jalloh[1], Khushi S. Patel[1], Emann M. Rabie[1], Anoop Alla[1], Samantha M. Shave[1], Saum A. Rahimi[2], William E. Beckerman[2] - [1]Rutgers Robert Wood Johnson Medical School, Piscataway, NJ; [2]Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

INTRODUCTION AND OBJECTIVES: Neutrophil-to-Lymphocyte ratio (NLR) is an easily obtained, low-cost marker of inflammation that has been shown to correlate with higher mortality and longer hospital stays in patients undergoing open lower extremity revascularization procedures. However, NLR has never been compared to other established risk calculators. We compared the prognostic value of NLR to the modified frailty index (mFI), a validated frailty metric.

METHODS: A retrospective analysis of patients who underwent open lower extremity revascularization procedures at a single tertiary care institution from January 2015 to December 2016 was conducted (N=163). An NLR cut-off point of 4.6 was determined from previous work using the maximally-ranked statistic method. Frailty was defined as mFI ≥0.27. Kaplan-Meier survival analyses were used to assess risk of death through five-year follow-up. Cox Proportional Hazard regressions were used to evaluate the association of NLR and Modified Frailty Index with mortality when controlling for possible confounders.

RESULTS: Seventy-six patients had preoperative NLR values available and were analyzed. Of those, sixty-six were considered frail. Median NLR was 4.6 with IQR [2.8-6.6]. Kaplan-Meier analysis showed a significant difference in mortality by NLR group (P=0.005; Figure 1A), but no difference when stratifying by frailty (P=0.15; Figure 1B). Controlling for multiple comorbidities including gender, age, smoking, BMI, diabetes, and hyperlipidemia, NLR was a significant independent predictor of mortality (P=0.032), but frailty was not (P=0.551).

CONCLUSIONS: This study suggests that NLR is a superior prognostic marker to mFI in patients undergoing open lower extremity revascularization. Given the low threshold for qualifying as frail, mFI is not a clinically useful tool for the patient population undergoing peripheral revascularization, which tends to have a heavy burden of comorbidities.

Figure 1A.

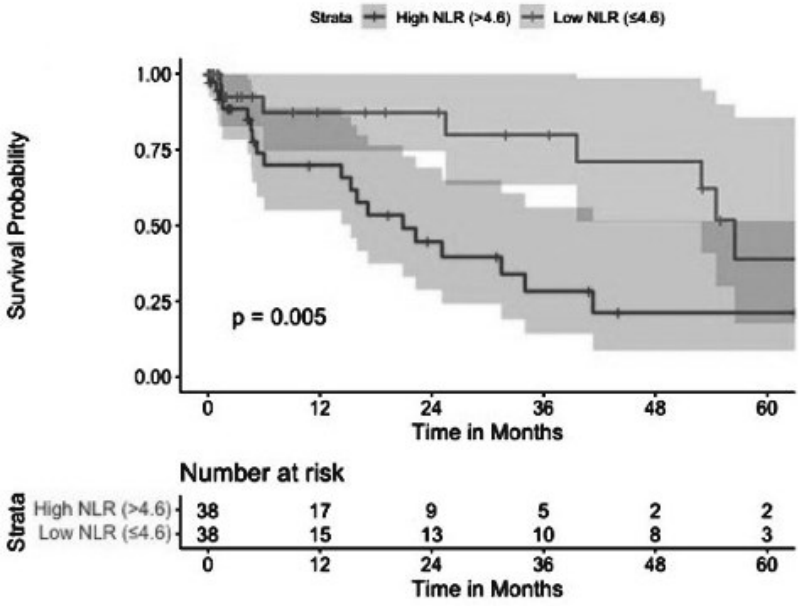
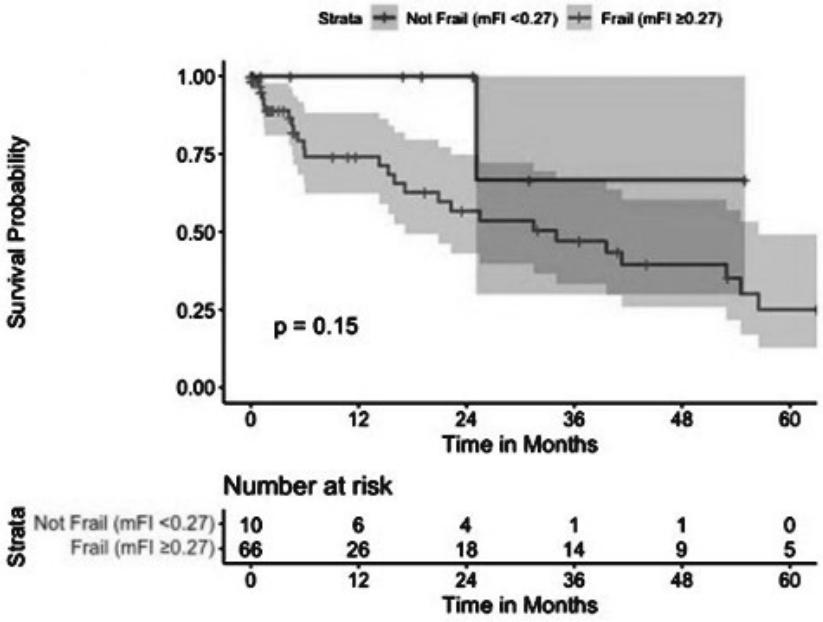

Strata
High NLR (>4.6)
Low NLR (≤4.6)
Survival Probability
1.00
0.75
0.50
0.25
0.00
p = 0.005
0
12
24
36
48
60
Time in Months
Number at risk
Strata
High NLR (>4.6) 38 17 9 5 2 2
Low NLR (≤4.6) 38 15 13 10 8 3
0
12
24
36
48
60
Time in Months

Figure 1B.


Strata
Not Frail (mFI <0.27)
Frail (mFI ≥0.27)
Survival Probability
1.00
0.75
0.50
0.25
0.00
p = 0.15
0
12
24
36
48
60
Time in Months
Number at risk
Strata
Not Frail (mFI <0.27)
Frail (mFI ≥0.27)
10
6
4
1
1
0
66
26
18
14
9
5
0
12
24
36
48
60
Time in Months

5:04 pm – 5:12 pm

7 (RF)

Post-Operative and Long-Term Outcomes of De Novo Versus Post-Repair Ruptured Abdominal Aortic Aneurysms in VQI-Medicare-Linked Database

Austin Fan, Sina Zarrintan, Kevin Yei, Mahmoud Malas - UC San Diego, La Jolla, CA

INTRODUCTION AND OBJECTIVES: Ruptured abdominal aortic aneurysms (rAAA) can happen in patients with no history of aortic intervention (de novo) or in patients who have undergone previous aortic repair. Our study compares the postoperative and long-term outcomes of repair for de novo vs post-repair rAAAs.

METHODS: Using the VQI-Medicare-Linked VISION database, we analyzed all patients who presented with rAAA between 2003-2019 for Endovascular Aortic Aneurysm Repair (EVAR) or Open Aneurysm Repair (OAR). Patients were classified into two groups: de novo or post-repair rupture. Primary outcomes included 90-days, one-year, and five-year mortality. Postoperative complications, five-year re-rupture, and five-year reintervention were secondary outcomes. Postoperative outcomes were evaluated using multivariable logistic regression analysis while long-term outcomes utilized Kaplan-Meier survival and Cox regression analyses.

RESULTS: A total of 2,506 (92.8%) de novo patients and 195 (7.2%) post-repair patients were analyzed. After adjusting for potential confounders, no differences were observed for 90-day mortality or any other postoperative outcomes. Furthermore, no differences were observed for one-year mortality (aHR[95% CI]: 1.06[0.84-1.34], p=0.617], five-year mortality (0.99[0.81-1.23], p=0.955), five-year re-rupture (1.57[0.96-2.56], p=0.070), or five-year reintervention (1.34[0.92-2.01], p=0.125). Sub-analysis of outcomes stratified by rAAA repair type revealed that within OAR, post-repair ruptures were associated with decreased risk for postoperative intestinal ischemia (0.49[0.28-0.85], p=0.011) and increased risk for five-year re-rupture (2.03[1.04-3.96], p=0.039) compared to de novo ruptures [Table].

CONCLUSIONS: Post-repair ruptures are not associated with significantly greater risk for mortality or reintervention compared to de novo ruptures. Although rAAAs should be treated with a procedure best suited to their anatomy and patient factors, our study suggests the rate of re-rupture is increased for post-repair open rAAA repairs compared to de novo open rAAA repairs.

Full Program & Abstracts

Table. Post-operative and long-term outcomes regarding ruptured abdominal aortic aneurysms (rAAAs) within de novo vs. post-repair aneurysms. Additional sub-analysis of post-operative and long-term outcomes stratified by repair type.

Postoperative Outcomes (*Reference: De Novo*)						
Outcome	Post-Repair vs De Novo rAAA (EVAR and OAR)		Post-Repair vs De Novo rAAA (Treated with EVAR)		Post-Repair vs De Novo rAAA (Treated with OAR)	
	aOR [95% CI]	p-value	aOR [95% CI]	p-value	aOR [95% CI]	p-value
90-days Mortality	0.9 [0.6-1.4]	0.778	1.0 [0.6 – 1.9]	0.936	0.7 [0.4 – 1.1]	0.127
Intestinal Ischemia	0.7 [0.4 - 1.4]	0.314	1.3 [0.5 - 3.7]	0.564	0.4 [0.2 - 0.8]	**0.018**
Myocardial Infarction	0.5 [0.2 - 1.1]	0.097	0.3 [0.05 - 2.2]	0.249	0.5 [0.2 - 1.2]	0.120
Renal	1.1 [0.8 - 1.7]	0.526	1.6 [0.4 – 7.0]	0.524	1.2 [0.8 - 1.8]	0.369
Respiratory	1.3 [0.8 - 2.0]	0.277	1.0 [0.5 – 2.0]	0.974	0.9 [0.5 – 1.6]	0.709
Long-Term Outcomes *(Reference: De Novo)*						
Outcome	Post-Repair vs De Novo rAAA (EVAR and OAR)		Post-Repair vs De Novo rAAA (Treated with EVAR)		Post-Repair vs De Novo rAAA (Treated with OAR)	
	aHR [95% CI]	p-value	aHR [95% CI]	p-value	aHR [95% CI]	p-value
1-year Mortality	1.1 [0.8 – 1.3]	0.617	1.3 [0.9 – 1.8]	0.130	0.8 [0.6 – 1.1]	0.175
5-year Mortality	1.0 [0.8 – 1.2]	0.955	1.1 [0.8 – 1.5]	0.447	0.8 [0.7 – 1.0]	0.123
5-year Re-Rupture	1.6 [1.0 – 2.6]	0.070	1.3 [0.5 – 2.9]	0.599	2.0 [1.0 – 4.0]	**0.039**
5-year Reintervention	1.4 [0.9 – 2.0]	0.125	1.6 [0.8 – 2.9]	0.161	1.6 [0.9 – 2.9]	0.115

5:12 pm – 5:24 pm

8

Pre-Operative Anemia is Associated with Poorer Postoperative Outcomes in Patients Undergoing Infrainguinal Bypass Surgery

Young Kim[1], Shiv S Patel[2], Anahita Dua[2], Abhisekh Mohapatra[2] - [1]Duke University, Durham, NC; [2]Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Pre-operative anemia is an important, modifiable risk factor among surgical patients. However, data is scarce on the impact of pre-operative anemia on post-operative outcomes after infrainguinal bypass.

METHODS: In this multi-institutional cohort study, data were retrospectively collected on all infrainguinal bypass procedures performed between 2010 and 2020. Patients were grouped by pre-operative hemoglobin according to the National Cancer Institute anemia scale (mild, 10-13 g/dL; moderate, 8.0-9.9 g/dL; severe, 6.5-7.9 g/dL). Multivariable comparisons were performed using logistic regression analysis.

RESULTS: A total of 627 patients underwent bypass over the 10-year study period. Complete data were available for 596 (95.1%) patients, with a median pre-operative hemoglobin of 11.2 g/dL (IQR 9.7-13.1). Median follow-up was 1.6 years. Pre-operative anemia was prevalent among bypass patients (mild 51.6% [n=308], moderate 24.0% [n=143], severe 5.2% [n=31]). Women were more likely to have moderate-severe pre-operative anemia (13.2% [normal] vs. 49.0% [moderate] vs. 58.1% [severe], $p<0.001$). Patients with pre-operative anemia were more likely to present with tissue loss (15.8% [normal] vs. 43.4% [moderate] vs. 41.9% [severe], $p<0.001$). Bypass target and conduit types were similar between groups. Anemic patients had longer median hospital length of stay (LOS) compared with non-anemic patients (4 days [normal] vs. 5 days [mild] vs. 6 days [moderate] vs. 7 days [severe], $p<0.001$). Post-operative mortality at 30-days trended higher among anemic patients (2.6% [normal] vs. 3.5% [moderate] vs. 9.8% [severe], $p=0.06$). On multivariable analysis, post-operative mortality was independently associated with severe anemia (OR 8.32 [1.21-57.3], $p=0.03$), emergent indication (OR 31.2 [2.66-366.9], $p=0.006$), and coronary artery disease (OR 10.3 [1.29-81.6], $p=0.03$).

CONCLUSIONS: Pre-operative anemia is common among patients undergoing infrainguinal bypass surgery, and is an independent risk factor for post-operative mortality and prolonged hospital stay. Future investigation is needed to determine whether correction of anemia improves post-operative outcomes in these high-risk patients.

5:24 pm – 5:36 pm

9

Risk Factors for Cerebral Hyperperfusion Syndrome Following Carotid Revascularization

Ashley C. Hsu, Brian Williams, Li Ding, Fred A. Weaver, Sukgu M. Han, Kenneth R. Ziegler, Gregory A. Magee - University of Southern California, Los Angeles, CA

INTRODUCTION AND OBJECTIVES: Cerebral hyperperfusion syndrome (CHS) is a rare complication of carotid revascularization that can result in severe post-operative disability and death. CHS is a well-described sequela of carotid endarterectomy (CEA) and, more recently, of transfemoral carotid artery stenting (TFCAS), but its incidence after transcarotid artery revascularization (TCAR) has not been delineated. We aimed to identify perioperative risk factors associated with CHS and to evaluate the impact of procedure type (CEA, TCAR, and TFCAS) on the development of CHS.

METHODS: The Society for Vascular Surgery (SVS) Vascular Quality Initiative (VQI) was queried for patients aged ≥18 years who underwent CEA, TCAR, or TFCAS from 2015-2021. Emergent procedures were excluded. The primary outcome was post-operative development of CHS. Univariate and multivariable logistic regression analyses were performed to identify factors associated with CHS.

RESULTS: 156,003 procedures were included (72.7% CEA, 12.4% TCAR, 14.9% TFCAS). The incidence of CHS after CEA, TCAR, and TFCAS were 0.15%, 0.18%, and 0.53%, respectively. When compared to CEA, the risk of CHS after TCAR was not significantly different (OR: 1.65; p=.103), but TFCAS was associated with an increased risk of CHS (OR: 3.06; p<.0001). Other risk factors associated with CHS were treatment for transient ischemic attack (TIA) or stroke (OR: 2.53; p<.0001), urgent intervention (OR: 2.63; p<.0001), and treatment of a total occlusion (OR: 3.98; p=.024).

CONCLUSIONS: The risk factors associated with CHS are treatment for TIA or stroke, urgent intervention, opening a total occlusion, and treatment with TFCAS. TCAR was not associated with an increased risk of CHS compared to CEA. Providers should have increased vigilance when treating patients with these risk factors and reopening a total occlusion should be avoided.

Full Program & Abstracts

5:36 pm – 5:48 pm

10

Association between Neighborhood Socioeconomic Deprivation and Likelihood of Lower Extremity Arterial Revascularization Versus Amputation

Oluwasegun A. Akinyemi, Terhas A. Weldeslase, Mallory Williams, Daniel Tran, David Rose, Edward Cornwell, III, Kakra Hughes - 1Howard University College of Medicine, Washington DC, DC

INTRODUCTION: Previous studies suggest that median household income is a major determinant of the likelihood of amputation versus revascularization on a national level. It has recently been postulated that it is not primarily income but overall socioeconomic deprivation that influences this disparity. We undertook this study to determine the effect of socioeconomic deprivation on the likelihood of revascularization versus amputation on a statewide level.

METHODS: We examined the Maryland State Inpatient Database (SID) for the years 2018 to 2020 to identify patients admitted with chronic limb-threatening ischemia (CLTI) who underwent either a major amputation or a revascularization procedure during that admission. Utilizing multivariate analyses, we determined the association between neighborhood socioeconomic deprivation (as measured by the Distress Community Index, DCI) and the likelihood of lower extremity arterial revascularization (LEAR). The DCI utilizes seven variables, based on zip codes, generating five levels of socioeconomic distress (prosperous, comfortable, mid-tier, at-risk, and distressed). We also determined the association between income, insurance status, and race/ethnicity on the likelihood of revascularization. In our multivariate analysis, we controlled for patients' age, sex, and preexisting comorbidities.

RESULTS: There were 5128 hospitalizations for CLTI in the study period. Of these, 2504 (49.9%) underwent LEAR. Among the patients who underwent LEAR, 55.4% were White, 39.8% Black, 2.3% Hispanic, 0.9% Asian/Pacific Islanders, 0.1% Native Americans, and the remaining 1.5% belonged to other ethnicities. We did not identify a significant association between the DCI and the likelihood of LEAR: Prosperous reference, Comfortable: (OR=0.89; 95% CI 0.74-1.09, p=0.26), Mid-Tier: (OR=0.78; 95% CI 0.61-1.00, p=0.07), At-Risk: (OR=0.91; 95% CI 0.65-1.26, p=0.56), and Distressed, (OR= 0.83; 95% CI 0.55-1.24, p=0.35).

CONCLUSION: In this Maryland statewide database, we did not identify an association between DCI and a likelihood of revascularization versus amputation in patients presenting with CLTI.

5:48 pm – 6:00 pm

11

Lower Extremity Extracorporeal Distal Revascularization (LEEDR) in a Swine Model of Prolonged Extremity Ischemia

Joseph Edwards[1], David P Stonko[2], Rebecca Treffalls[1], Eric Lang[1], Hossam Abdou[1], Patrick Walker[1], Brandon Propper[3], Todd Rassmussen[4], Jonathan J. Morrison[1] - [1]R. Adams Cowley Shock Trauma Center, Baltimore, MD; [2]Johns Hopkins Hospital, Baltimore, MD; [3]Uniformed Services University of the Health Sciences, Bethesda, MD; [4]Mayo Clinic, Rochester, MN

INTRODUCTION: Acute arterial occlusion of the lower extremity is a time-dependent emergency that requires prompt revascularization to avoid fasciotomy and limb loss. Lower extremity extracorporeal distal revascularization (LEEDR) can be initiated bedside when definitive revascularization is delayed. The aim of this study is to evaluate this technique in a swine model of prolonged extremity ischemia.

METHODS: Anesthetized swine underwent right femoral and left posterior tibial artery cannulation, left iliac venous flow monitoring (mL/min), and continuous left anterior compartment pressure monitoring (mmHg). The iliac artery was clamped for 6 hrs. LEEDR animals underwent 5 hrs of extracorporeal femoral-to-tibial blood flow at 150mL/min; controls had no intervention. At 6 hours, LEEDR was discontinued, iliac flow restored, and anterior compartment pressures monitored for 3 hours.

RESULTS: Baseline characteristics were similar across both groups. Iliac clamping saw an expected fall in iliac venous flow (258±30 to 82±19; $p<0.001$). LEEDR resulted in a rise in iliac venous flow (82±20 to 181±16; $p<0.001$); control arm flow remained reduced (71±8; $p<0.001$) (Figure A). Once inflow was restored, venous flow returned to baseline. Revascularization provoked a higher peak compartment pressure in the control arm versus in the LEEDR group (25±5 versus 6±1; $p=0.02$) (Figure B).

CONCLUSION: An extracorporeal circuit can be used to temporarily revascularize an extremity in a swine model of prolonged ischemia, mitigating reperfusion injury and maintaining normal compartment pressures. This concept should undergo further evaluation as a bedside tool to mitigate extremity ischemia prior to definitive revascularization.

Figure A. Normalized Iliac Vein Flow

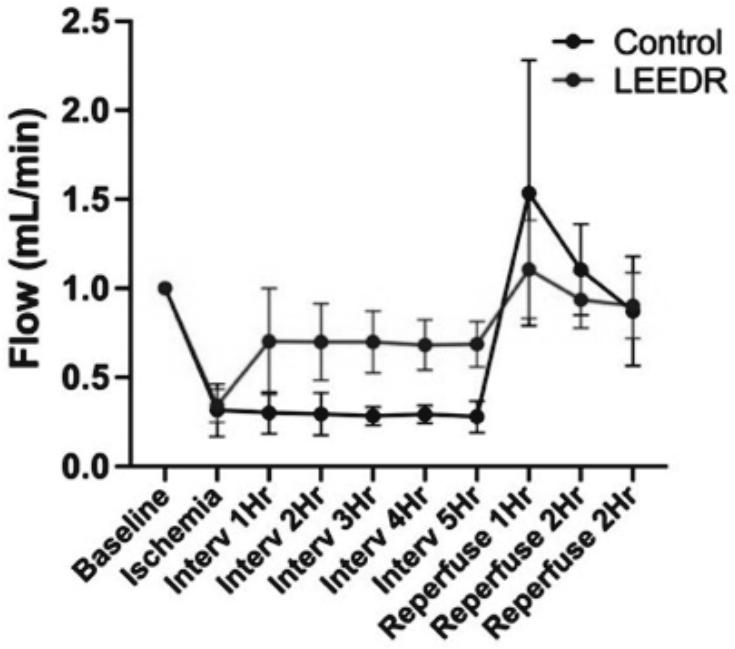
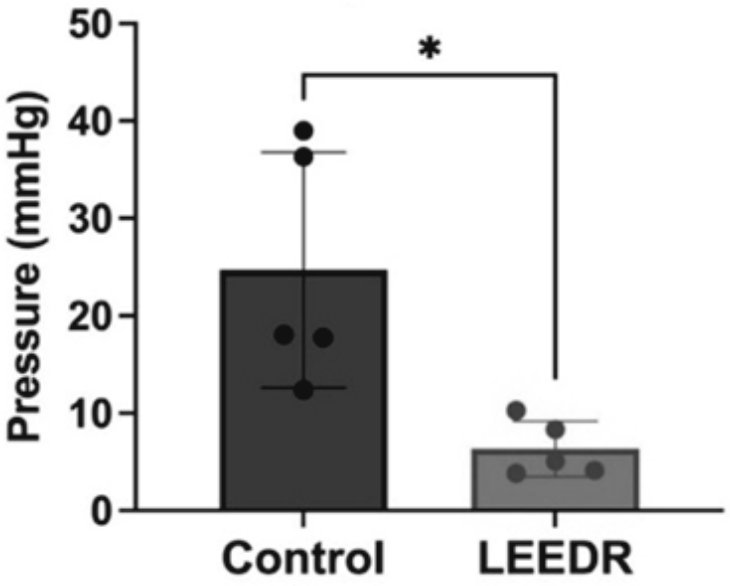


Figure B. Peak Compartment Pressure



6:00 pm – 7:30 pm **WELCOME RECEPTION**
All attendees, guests & exhibitors are welcome.

Full Program & Abstracts

Friday, February 24, 2023

6:00 am – 7:00 am	Continental Breakfast in the Exhibit Hall
6:00 am – 9:30 am	Registration
7:00 am – 9:04 am	**SCIENTIFIC SESSION II** Moderators: Roan Glocker, MD & David Kauvar, MD
7:00 am – 7:12 am	12 **Minimum Asymptomatic Carotid Endarterectomy Surgeon and Hospital Volume Cutoffs** Joshua Geiger[1], James Iannuzzi[2], Michael Stoner[1], Adam Doyle[1] - [1]University of Rochester School of Medicine and Dentistry, Rochester, NY; [2]University of California, San Francisco, San Francisco, CA

INTRODUCTION AND OBJECTIVES: There is a known association between volume and outcomes after carotid endarterectomy (CEA). A recent analysis suggested rates of stroke and death do not significantly reduce after a surgeon volume cutoff of 20 CEAs per year. However, these RESULTS would severely limit access. The objective here is to identify a lower optimal cutpoint for surgeon and hospital volume for asymptomatic CEA.

METHODS: We evaluated asymptomatic CEA patients using the NYS SPARCS database. The relationship of 3-year averaged volumes for surgeons and hospitals to 30-day stroke were assessed using logistic regression and included both hospital and surgeon volume. Optimized cutpoints were the lowest significant volume cutoff that minimized the odds ratio for stroke.

RESULTS: We studied 32,549 CEAs performed by 271 vascular surgeons in 136 centers. The median surgeon volume was 26.3 (IQR:12.3-51.7) and the median hospital volume was 67 (IQR:36.3-119.3). The surgeon volume cutpoint was 5 and the hospital volume cutpoint was 11 cases per year. There were 1,563 (4.8%) procedures performed by surgeons with a volume <5 and 1130 (3.47%) procedures performed by hospitals with a volume <11. Perioperative stroke rates were 1.5% (95%CI:1.4-1.6) and 2.9% (95%CI:2.1-2.8) for an average yearly surgeon volume ≥5 and <5 ($p<0.001$), respectively. Stroke rates were 1.48% (95%CI:1.4-1.6) and 3.54% (95%CI:2.5-4.8) for an average yearly center volume ≥11 and <11 ($p<0.001$), respectively. High volume surgeons and centers were associated with a shorter length of stay. Neither surgeon nor hospital volume predicted perioperative mortality.

CONCLUSIONS: These data demonstrate an improvement in outcomes at lower volume thresholds than previously reported. These values can be used in future studies or guidelines after accounting for the impact of other important factors that may be driving volume-outcomes relationships in asymptomatic CEA.

Figure 1.

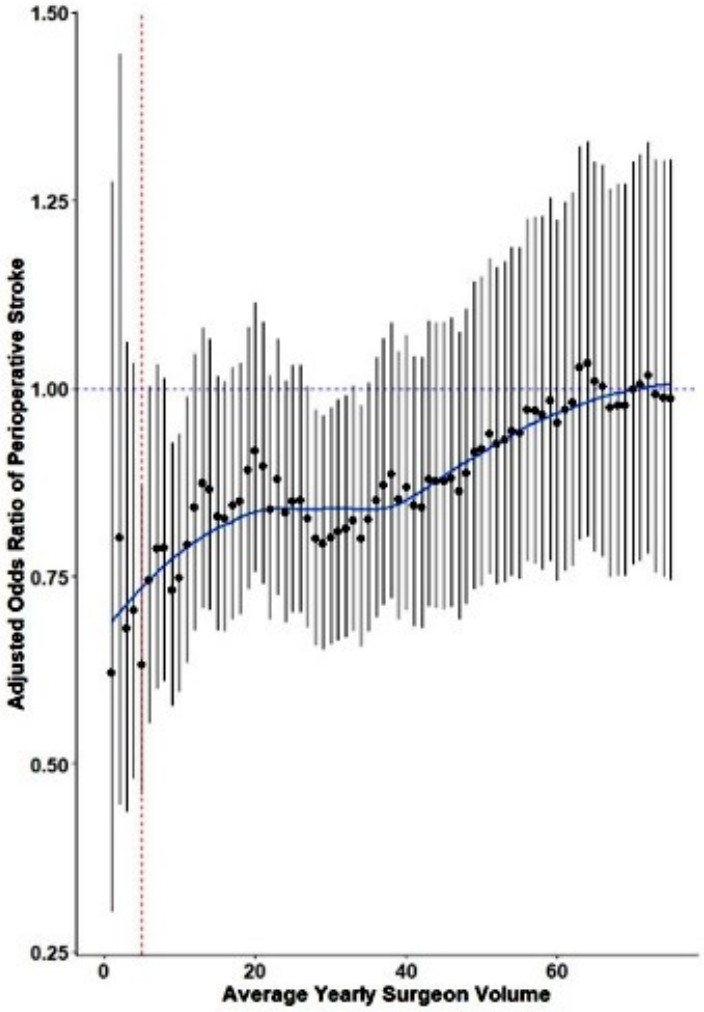
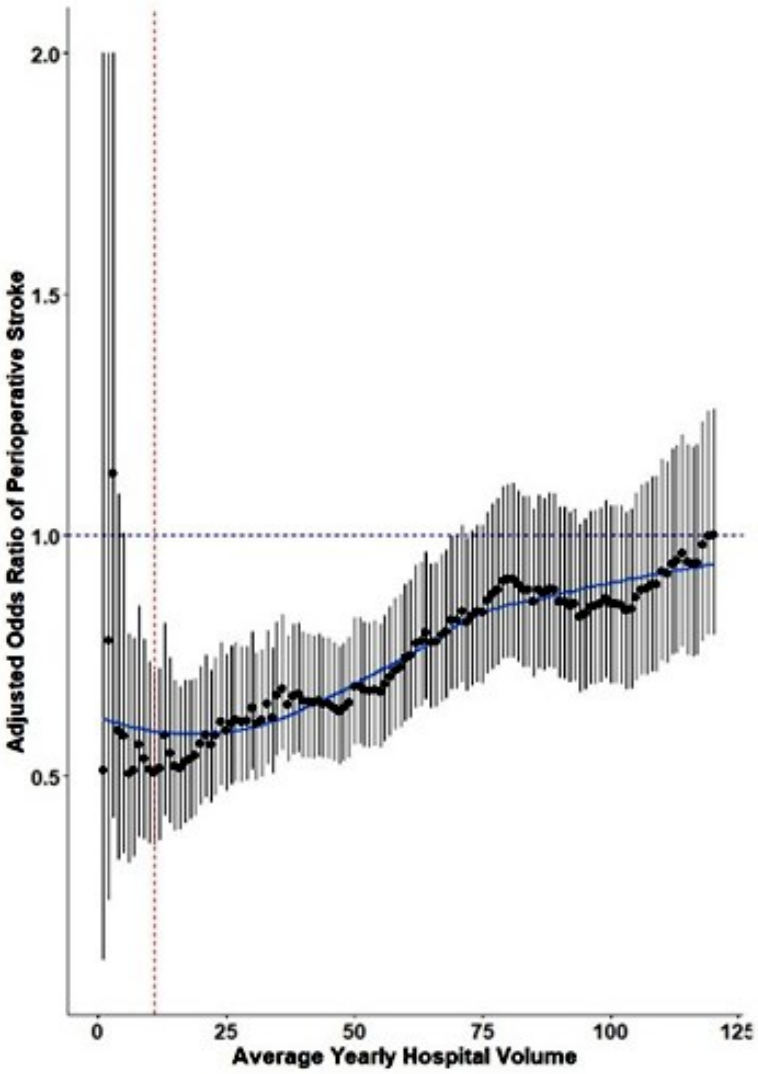


Figure 2.


2.0
1.5
1.0
0.5
Adjusted Odds Ratio of Perioperative Stroke
0
25
50
75
100
125
Average Yearly Hospital Volume

7:12 am – 7:24 am

13

Association of Pre- and Peri-Operative Vein Mapping with Hemodialysis Access - Characteristics and Outcomes

Hannah L. Wolf, Charles J. Hillenbrand, IV, Gale J. Tang, Andrew Warren - University of Washington, Seattle, WA

INTRODUCTION AND OBJECTIVES: In addition to routine pre-operative vein mapping as opposed to selective, we also practice perioperative bedside ultrasound after regional or general anesthesia as this can reveal additional adequate vein for fistula creation. We hypothesized that patients whose plan changed (noncongruent) based on perioperative ultrasound would have similar outcomes in terms of maturation and functional patency to those whose plan remained congruent.

METHODS: We performed a retrospective chart review evaluating patients who received initial hemodialysis access from 01/01/2017 to 12/31/2021 at the Veterans Affairs Puget Sound in Seattle, Washington. Results were analyzed using Pearson Chi-Squared and Student's T-test in SPSS. Kaplan-Meier Survival Curves were performed to evaluate maturation rate and functional patency.

RESULTS: Initial hemodialysis access was created in 153 patients (n=86 congruent, n=67 noncongruent). Maturation rate was similar in both groups (congruent 84%, non-congruent 83%). There were no significant differences in the number of procedures needed to achieve maturation or maintain functional patency. The congruent group had significantly more forearm fistulas created (71% versus 47%, p=0.02). Arterial issues were found in 39% of patients. 30% of the patients in the non-congruent group who had either no fistula option or only adequate basilic vein on pre-operative vein mapping underwent either a native fistula over graft or a fistula other than a basilic vein-based fistula sparing a second-stage superficialization operation with a maintained 80% maturation rate.

CONCLUSIONS: Maturation rates and subsequent interventions to maintain patency were similar across groups; however, there was a high proportion of patients with arterial issues suggesting that the arterial system should also be examined perioperatively if using a selective pre-operative vein mapping strategy. Perioperative ultrasound improved the ability to provide a native arteriovenous fistula or one-stage operations to patients who would not be candidates based on pre-operative vein mapping alone.

Full Program & Abstracts

7:24 am – 7:36 am

14

Single-Site Review of Spinal Cord Protection Protocols Including the Utilization of Spinal Drains Versus Medical Management with Branched Endovascular Aortic Repair

Spencer J. Lucas[1], Kristopher B. Johnson[1], Ryan Rykhus[1], Kirby Hora[1], Angela VandenHull[2], Kari Bates[2], Joni Sengos[2], Patrick W. Kelly[2] - [1]University of South Dakota Sanford School of Medicine, Sioux Falls, SD; [2]Sanford Health, Sioux Falls, SD

INTRODUCTION AND OBJECTIVES: Spinal cord ischemia (SCI) continues to be a devastating complication of repair of thoracoabdominal aortic aneurysms (TAAAs). The objective of this study is to present single-site outcomes after the implementation of a standardized neuroprotective protocol following branched endovascular aortic repair.

METHODS: A standardized neuroprotective protocol including pre-operative steroids and naloxone, intraoperative hemodynamic parameters, and post-operative treatment goals was initiated in November 2019. We reviewed physician modified BEVARs completed from 2012 and 2021 and outcomes before (n=107) and after (n=67) the implementation of our neuroprotective protocol. The primary endpoint was the incidence of all SCI events. Secondary endpoints included outcomes, complications, and mortality. Patients with Crawford extents I-III were deemed high risk for SCIs and underwent a subset analysis.

RESULTS: Post-protocol spinal drain use was lower (6% vs. 38.3%; p=<0.0001) among all patients and lower (16% vs. 70.7%; p=<0.0001) among the high-risk patients, with 100% of these post-protocol drains placed solely as a rescue measure. Rates of any SCI among all the patients before and after implementation of the protocol were 9.3% (n=10 of 107) and 6% (n=4 of 67; p=0.57), respectively. In comparison to the high-risk patients, our protocol significantly reduced SCI rates to zero (0% vs. 17.1%; p=0.0407). Overall, the patients in the post-protocol group had significantly decreased 1-year mortality rate (9% vs. 27.1%; p=0.0035).

CONCLUSIONS: Implementation of a standardized neuroprotective protocol that focuses on medical management and fluid dynamics over spinal drain usage may significantly reduce risk of SCI after BEVAR, with the most significant improvement of SCI outcomes involving those at greatest risk for developing SCI. Also noteworthy, there was a significant improvement to patient 1-year survivability after the implementation of the protocol.

Full Program & Abstracts

7:36 am – 7:48 am

15

Exogenous Testosterone Replacement Therapy is Associated with Increased Risk for Arterial Graft Infections

Kaohinani J. Longwolf, Cali E. Johnson, Joshua J. Horns, James M. Hotaling, Benjamin S. Brooke - University of Utah, Salt Lake City, UT

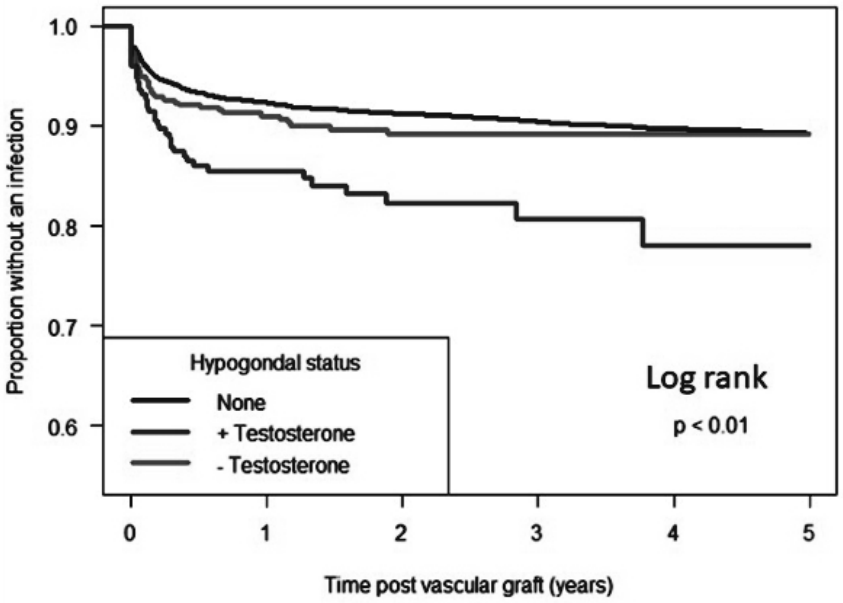
INTRODUCTION AND OBJECTIVES: Prosthetic graft infections are a major source of morbidity following vascular bypass surgery. Recent urologic data suggests that hypogonadal men and low testosterone may infer an increased risk for infection of prosthetic implants. We designed this study to evaluate the relationship between hypogonadism, testosterone replacement therapy (TRT) and vascular graft infections.

METHODS: We performed a retrospective analysis of claims in the MarketScan database identifying men greater than 18 years of age who underwent placement of a prosthetic graft in the peripheral arterial circulation from January 2009 to December 2020. Patients were stratified based on diagnosis of hypogonadism and TRT within 180-days prior to surgery. The primary outcome was graft infection and need for excision. The association between hypogonadism and TRT on risk of graft infection was analyzed using Kaplan-Meier plots and multivariate Cox proportional hazards models.

RESULTS: We identified 14,534 men who received a prosthetic graft during the study period, of which 802 (6%) had diagnosis of hypogonadism. Among men with hypogonadism, 251 (31%) were receiving TRT. Patients on TRT were younger, less likely to have Medicare insurance, and more likely develop a graft infection during follow-up (12% vs. 8%; P<.01). At 5-years, freedom from graft infection was significantly lower for men on TRT than patients not on TRT or without hypogonadism (Figure). In Cox regression models adjusted for age and insurance status, hypogonadal men on TRT were at a significantly increased risk of graft infection (HR:2.08, 95% CI:1.5-2.8) compared to controls.

CONCLUSIONS: This study demonstrates TRT among hypogonadal men is associated with an increased risk of prosthetic arterial graft infections. Temporary cessation of TRT should be considered for men undergoing arterial graft implants.

Figure.


1.0
0.9
0.8
0.7
0.6
Proportion without an infection
Hypogondal status
None
+ Testosterone
- Testosterone
Log rank
p < 0.01
0
1
2
3
4
5
Time post vascular graft (years)

Full Program & Abstracts

7:48 am – 7:56 am

16 (RF)

Sex-Based Disparities in Major Adverse Limb Events Highest for Femoropopliteal Intervention after Accounting for Presenting Wifi Stage for Chronic Limb Threatening Ischemia

Emanuel A. Jaramillo[1], Katherine M. Sanders[2], Elizabeth M. Lancaster[2], Clara Gomez-Sanchez[2], Jade S. Hiramoto[2], Warren J. Gasper[2], Michael S. Conte[2], James C. Iannuzzi[2] - [1]University of California, San Francisco-East Bay, Oakland, CA; [2]University of California, San Francisco, San Francisco, CA

INTRODUCTION AND OBJECTIVES: Sex-based disparities in major adverse limb events (MALE) have been documented in chronic limb threatening ischemia (CLTI). Prior proposed explanations for these differences include presentation severity and anatomic differences. This study assessed whether sex-based disparities in MALE persist after peripheral vascular intervention (PVI) for CLTI when accounting for disease severity at presentation using the Wound, Ischemia, and foot Infection (WIfI) classification and anatomic disease distribution.

METHODS: The VQI PVI dataset (2016-2022) was queried for CLTI. Exclusion criteria were missing sex, WIfI stage, or 1-year follow-up. The primary endpoint was 1-year MALE (major amputation or reintervention on the initial treatment limb). A multivariate hierarchical Fine Gray analysis was performed controlling for hospital variation, competing risk of death, and presenting WIfI stage to assess the independent association of sex with MALE.

RESULTS: Overall, 28,602 cases (30%) met inclusion criteria and 42% were women. On bivariate analysis, female sex was associated with older age, Black race, Latinx ethnicity, CVD, COPD, rest pain, and inflow and femoropopliteal intervention level ($p<0.01$). MALE at 1-year was 18% overall. On multivariate analysis, women had a higher 1-year subdistribution hazard (SHR) for MALE (SHR 1.09; 95% Confidence Interval (CI) 1.03-1.15; $p=0.004$) compared to men. The difference in MALE by sex was most predominant in femoropopliteal interventions (SHR 1.13; CI 1.05-1.23; $p=0.002$). One-year amputation hazard was lower for women (SHR 0.85; CI 0.75-0.96; $p=0.007$), while reintervention hazard was higher (SHR 1.20; CI 1.11-1.30; $p<0.001$).

CONCLUSIONS: Female sex is associated with increased hazards for MALE after PVI for CLTI despite controlling for WIfI. Differences in MALE were largely due to reinterventions, particularly for femoropopliteal intervention. Further evaluation should focus on treatment options and efficacy differences by sex in femoropopliteal disease.

7:56 am – 8:04 am

17 (RF)

Impact of Direct Factor Xa Inhibitors on the Coagulation Profile and Thrombosis Rate in Patients with Peripheral Artery Disease Following Revascularization

Monica Majumdar[1], Ryan P. Hall[1], Sasha Suraez Ferreira[1], Guillaume Goudot[1], Samual Jessula[1], Lois Owolabi[1], Zachary Feldman[1], Ryan Cassidy[2], Anahita Dua[1] - [1]Massachusetts General Hospital, Boston, MA; [2]Hackensack Meridian School of Medicine, Nutley, NJ

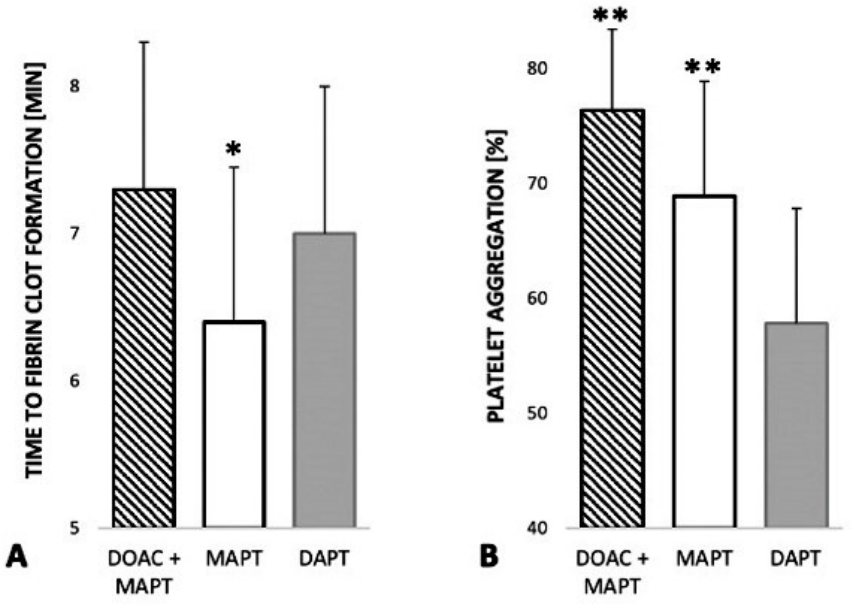
INTRODUCTION: The role of thrombin in vascular pathology is a focus of investigation. The incorporation of direct factor-Xa inhibition into practice patterns is based on its theoretical dual-pathway attenuation of both thrombin generation and platelet aggregation. However, quantification of direct anti-Xa medications effect on platelet function is not established. Thromboelastography with Platelet Mapping (TEG-PM) leverages dual-pathway metrics to provide comprehensive coagulation profiles. We aimed to evaluate the effects of direct oral anticoagulants (DOACs) on coagulation and platelet function profiles and correlate these data with clinical endpoints including thrombosis in patients with PAD.

METHODS: We conducted a prospective study of patients undergoing lower extremity revascularization with serial perioperative TEG-PM analysis. Patients on DOACs were compared to those without, and stratified by concurrent mono- or dual-antiplatelet regimens (MAPT/DAPT). Post-operative rates of graft/stent thrombosis were compared between groups.

RESULTS: 556 samples from 176 patients were analyzed. 24.5% were reflective of circulating DOAC therapy. Compared to MAPT alone, patients on DOAC+MAPT exhibited a significantly longer time to initial fibrin clot formation (*R-time*) [7.3±2.0 vs. 6.4±2.1 minutes; $p<.01$] (Figure 1A). There was a trend towards increased platelet aggregation in the DOAC+MAPT cohort compared to MAPT alone [76.4±26.9 vs. 68.9±28.3, $p=.07$]. Patients on DAPT exhibited significantly less platelet aggregation compared to either group [57.8±31.3; all $p<.05$] (Figure 1B). 16/57 patients on DOACs experienced post-operative graft/stent thrombosis, while only 14/119 patients not on DOACs experienced a thrombotic event [28.1% vs. 11.8%, $p=0.01$].

CONCLUSION: Direct factor-Xa inhibition resulted in a prolonged R-time but had no impact on platelet aggregation. Patients in the DOAC group experienced a significantly greater rate of thrombotic events. Further research comparing DOAC therapy to a dual-antiplatelet approach may add clarity to emerging multimodal antithrombotic recommendations.

Figure 1. TEG-PM metrics compared between those on DOAC therapy with MAPT vs. MAPT and DAPT alone in terns of A: time to fibrin clot formation (*R*-time) and B: percent platelet aggregation.



**R-time* p<.05 compared to DOAC + MAPT

***Platelet aggregation p<.05 compared to DAPT

Full Program & Abstracts

8:04 am – 8:12 am

18 (RF)

Circulating Markers of Matrix Homeostasis are Dysregulated in Hypertension-Induced Aortic Stiffness

Ryan Gedney, Victoria Mattia, Mario Figueroa, Ying Xiong, Rupak Mukherjee, Jeffrey A. Jones, Jean M. Ruddy - Medical University of South Carolina, Mt. Pleasant, SC

INTRODUCTION: Increased aortic stiffness due to remodeling of the extracellular matrix is a known predictor of cardiovascular morbidity and mortality. Assessment of aortic stiffness has not been widely adopted, likely due to the need for specialized equipment. We hypothesize that plasma markers associated with matrix homeostasis correlate to an increase in aortic stiffness.

METHODS: Aortic distensibility, the inverse of stiffness, was measured via ultrasound in C57Bl/6 mice that were normotensive (n=4) or hypertensive (AngiotensinII (AngII) infusion, 1.46mg/kg/day x21 days, n=4). At terminal, blood was collected and plasma was analyzed by ELISA for matrix homeostasis markers (Interleukin-6 (IL-6), Cathepsin S (CtsS), Cystatin C (CysC), Osteoprotegerin (OPG), Tenascin C (TNC)). To assess the effect of tension alone, abdominal aortic rings were held in a myograph at experimentally derived optimal tension (OT, 1.5g, n=4) or OT+30% (1.95g, n=4) for 6-hours. Expression of matrix markers was assessed by QPCR. Additionally, vascular smooth muscle cell (VSMC) tension-induced vs AngII-induced (100nM) expression of the matrix markers was quantified by QPCR after 12-hours of 12% cyclic biaxial stretch. Statistical analysis was performed by T-test.

RESULTS: At 21-days, blood pressure was increased >30%, was associated with reduced aortic distensibility, and demonstrated upregulated plasma levels of IL-6, CysC, and OPG ($p<0.05$ vs. controls). Aortic rings at OT+30% and Stretch VSMCs also had increased expression of these markers, supporting tension-induced signaling. Furthermore, in Stretch VSMCs, the protease CtsS was upregulated while the matrix fibrillar protein TNC was reduced ($p<0.05$ vs. Static). Integrating the biologic stimulus, AngII alone upregulated IL-6 expression in Static VSMCS, and Stretch+AngII amplified CysC expression over either stimulus alone.

CONCLUSION: In hypertension-induced aortic stiffness, changes in the plasma levels of markers associated with matrix homeostasis can reflect dysfunctional remodeling driven by mechanobiologic signaling in VSMCs and may represent therapeutic targets to reduce cardiovascular morbidity and mortality.

8:12 am – 8:24 am

19

Risk of Stroke with Thoracic Endovascular Aortic Repair in the Aortic Arch

Alexander D. DiBartolomeo, Li Ding, Fred A. Weaver, Sukgu M. Han, Gregory A. Magee - University of Southern California, Los Angeles, CA

INTRODUCTION AND OBJECTIVES: Thoracic endovascular aortic repair (TEVAR) involving the aortic arch is increasingly being performed and novel endografts have been developed for this procedure, but the association of stroke and relative risk of procedural techniques remains unclear. This study evaluates the procedural risk factors for stroke and mortality with zone 0-2 TEVAR.

METHODS: The Vascular Quality Initiative registry was queried for patients who underwent TEVAR with proximal landing in zone 0-2 from 2010 to 2020. Emergent and ruptured cases were excluded. Primary exposure variables were proximal seal zone (0-2) and branch vessel revascularization technique: open debranching/bypass, total endovascular incorporation, or hybrid (at least one branch open and one branch endovascular). Primary outcome was perioperative in-hospital stroke and secondary outcome was in-hospital mortality. Univariable and multivariable logistic regression analyses were performed.

RESULTS: In total 3,059 patients were analyzed with 252 in zone 0 (8%), 377 in zone 1 (12%) and 2,430 in zone 2 (80%). For zone 0, 1, and 2, the stroke rate was 11.9%, 6.4% and 4.8% ($P<0.0001$) and in-hospital mortality was 7.1%, 6.1% and 3.7% ($P=0.007$), respectively. Branch vessel revascularization technique was associated with stroke in zone 0 with a 3-fold higher stroke rate for total endovascular incorporation of branches compared to hybrid and open techniques ($P<0.01$). On multivariable analysis, zone 0 was independently associated with 2.5-fold increased odds of stroke compared to zone 2 (95% CI 1.5-3.9, $P<0.0001$).

CONCLUSIONS: Stroke rate was 2-3 times higher for zone 0 TEVAR compared to zones 1 and 2. Within zone 0, total endovascular branch incorporation was associated with a 3-fold higher stroke rate than open and hybrid techniques. Future device design modifications and novel endovascular strategies for stroke prevention are required to make total endovascular repair of the aortic arch an acceptable alternative to hybrid and open debranching/ bypass techniques.

8:24 am – 8:36 am

20

Survival and Operative Outcomes for Open and Endovascular Repair in Chronic Mesenteric Ischemia

Daniel Lehane, Joshua Geiger, Kshitij Desai, Michael Stoner - University of Rochester School of Medicine and Dentistry, Rochester, NY

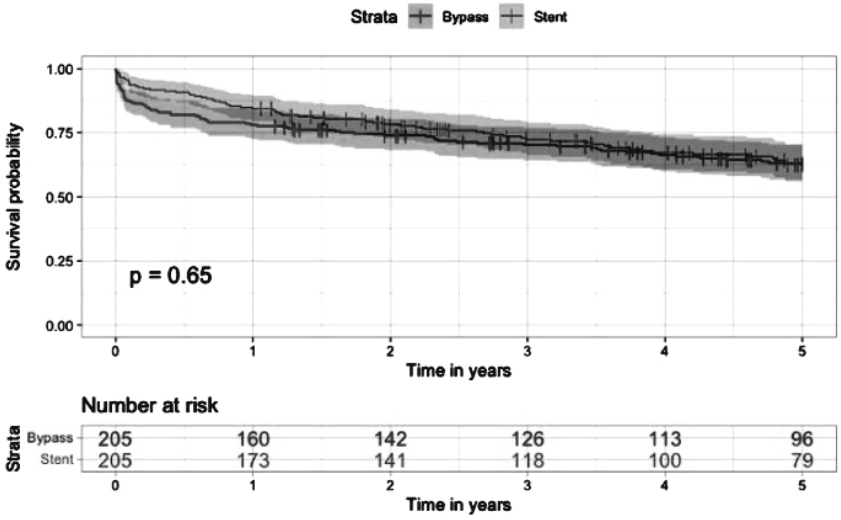
INTRODUCTION AND OBJECTIVES: There are limited analyses of survival and post-operative outcomes in chronic mesenteric ischemia (CMI) utilizing data from large cohorts. Current guidelines recommend open repair (OR) for younger, healthier patients when long-term benefits outweigh increased perioperative risks or for poor endovascular repair (ER) candidates. This study investigated whether long-term outcomes differ between these treatment modalities.

METHODS: Patient data was extracted from SPARCS, the New York statewide all-payer database containing demographics, diagnoses, treatments, and charges. Patients were selected for CMI and subsequent ER or OR using ICD-9 codes. Cox proportional hazards testing was performed for 1- and 5-year survival using a propensity-matched cohort. Outcomes analysis was performed using multivariate logistic regression.

RESULTS: From 2000 to 2014, 729 patients met inclusion criteria. Of these, 205 (28.1%) underwent OR and 524 (71.9%) ER. No difference was found in 1 -year (p=0.077) or 5-year (p=0.65) survival between propensity-matched groups. Cancer (HR:3.02, 95% CI:1.08-8.46; p=0.035) and dysrhythmia (HR:1.93, 95% CI:1.18-3.14; p=0.009) correlated with overall 1-year mortality. Cancer (HR:3.09, 95% CI:1.42-6.72; p=0.004), congestive heart failure (HR:1.78, 95% CI:1.20-2.62; p=0.004), and chronic pulmonary disease (HR:1.65, 95% CI:1.16-2.34, p=0.005) correlated with total 5-year mortality. Additionally, stenting in CMI was associated with increased 5-year value (life years post-procedure/charges) after the initial procedure (0.87±1.67 vs. 0.48±0.54; OR:1.46, 95% CI:1.15-1.86, p=0.002).

CONCLUSIONS: This is the largest retrospective propensity-matched single-study cohort to analyze long-term survival outcomes after intervention for CMI. Long-term mortality was independent of treatment modality, suggesting patient comorbidities are associated with long-term mortality outcomes. Therefore, treatment selection should depend on anatomic considerations and long-term value. In patients with amenable anatomy, endovascular repair should be considered over open repair based on the superior procedural value.

Figure. 5-year survival of stenting versus open bypass in a retrospective propensity-matched cohort of patients with chronic mesenteric ischemia. No mortality difference is seen between groups after 5 years of follow-up.



Full Program & Abstracts

8:36 am – 8:48 am

21

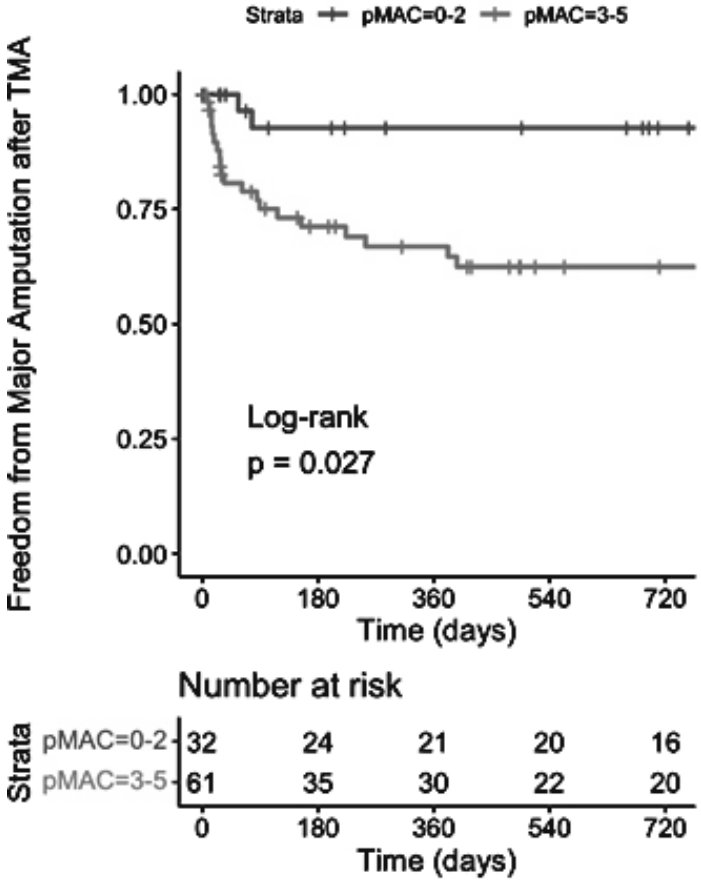
Pedal Arterial Calcification is Associated with Progression from Transmetatarsal Amputation to Major Amputation Following Infrainguinal Revascularization for Chronic Limb-Threatening Ischemia

Iris H. Liu[1], Bian Wu[2], Rym El Khoury[1], Roberto Ferraresi[3], Alexander M. Reyzelman[1], Warren J. Gasper[1], Jade S. Hiramoto[1], Peter A. Schneider[1], Michael S. Conte[1], Shant M. Vartanian[1] - [1]UCSF, San Francisco, CA; [2]Kaiser Permanente, San Francisco, CA; [3]Clinica San Carlo, Paderno Dugano, Milan, Italy

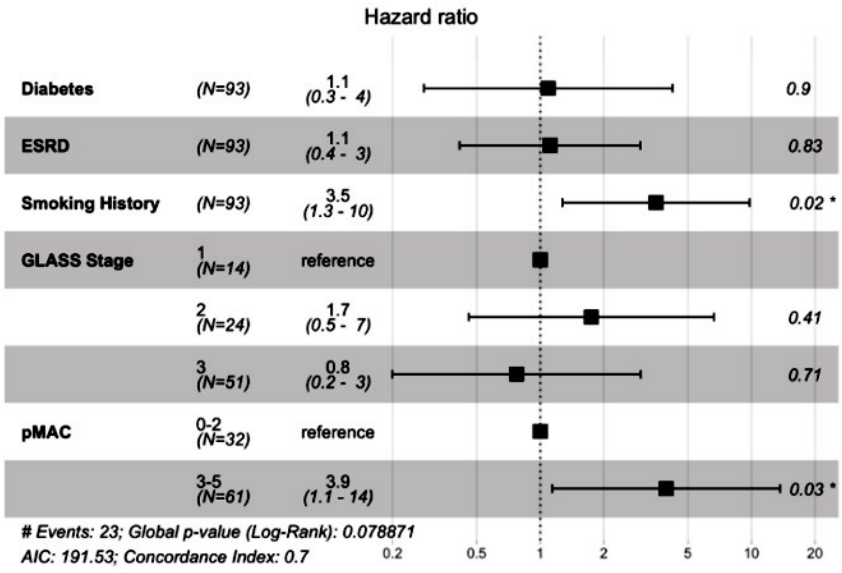
INTRODUCTION AND OBJECTIVES: The pedal medial arterial calcification (pMAC) score is associated with lack of hemodynamic improvement and major amputation despite technically successful infrainguinal revascularization for CLTI. We hypothesize that after transmetatarsal amputation (TMA) for limb salvage, severe pedal calcification burden is associated with progression to major amputation.

METHODS: This is a single-institution retrospective study of 358 patients undergoing first-time infrainguinal revascularization for CLTI (2011-2021). pMAC scores [0-5 (low: 0-2, high: 3-5)] were calculated using foot x-rays.

RESULTS: 93/358 (26%) underwent TMA within 6 months of index revascularization. In the total cohort, mean age was 70 years, 69% were male, 73% had diabetes, and 19% had ESRD. In a logistic multiple regression model, factors independently associated with TMA were male sex, WIfI stage 4 and high pMAC score. Among those who underwent TMA, 61/93 (66%) had high pMAC scores. 24/93 (26%) subsequently required major amputation at a median time of 59 days (IQR 24-145) from TMA. Progression to major amputation was associated with high pMAC, as well as diabetes, smoking history, lower burden of femoropopliteal disease, and endoluminal-first revascularization.


Strata pMAC=0-2 pMAC=3-5
Freedom from Major Amputation after TMA
1.00
0.75
0.50
0.25
0.00
Log-rank
p = 0.027
0
180
360
540
720
Time (days)
Number at risk
Strata
pMAC=0-2
pMAC=3-5
32 24 21 20 16
61 35 30 22 20
0
180
360
540
720
Time (days)

In a Cox proportional hazards model, smoking history and pMAC score were independently associated with TMA progression to major amputation.



CONCLUSIONS: The pMAC score is independently associated with TMA progression to major amputation in patients undergoing infrainguinal revascularization for CLTI. Patients with high pMAC scores may require closer surveillance with a low threshold for reintervention to achieve adequate perfusion for advanced wound healing.

8:48 am – 8:56 am

22 (RF)

Rectus Sheath Block Improves Patient Recovery Following Open Aortic Surgery

Colin Cleary[1], Ya-Huei Li[2], Akhilesh Jain[3], Pranjali Kainkaryam[4], Parth Shah[3], Thomas Divinagracia[3], James Gallagher III[3], Elizabeth Aitcheson[3], Mouhanad Ayach[3], Kevin Finkel[4], Edward Gifford[3] - [1]University of Connecticut School of Medicine, Farmington, CT; [2]Hartford Hospital, Hartford, CT; [3]Hartford Hospital, Division of Vascular Surgery, Hartford, CT; [4]Integrated Anesthesia Associates, Hartford, CT

INTRODUCTION AND OBJECTIVES: Post-operative pain management remains a barrier to recovery following aortic surgery. Although epidural catheters help in adjunctive pain management, less is known about the use of rectus sheath blocks. We compared patient recovery following open abdominal aortic surgery (OAS) with and without adjunctive rectus block.

METHODS: Patients undergoing open abdominal aortic aneurysm repair and aortobifemoral bypass for occlusive disease were included. Patients were stratified by use of adjunctive rectus block (RB) versus general anesthesia alone (GA). Opioid medications were standardized into morphine milligram equivalents (MME). Outcomes included time to extubation, MME utilization, length of stay, discharge MME, and post-operative complications. Categorial data was compared with Person Chi-Square tests or Fisher's exact tests. Continuous data was tested with independent t-tests or Mann-Whitney U tests.

RESULTS: From January 2017 to April 2022, there were 39 OAS patients with concomitant RB vs. 55 with GA alone. Patients were evenly distributed in age, BMI, smoking history, hypertension, diabetes, CAD, COPD, ASA class and prior opioid use. Patients needing urgent repair were more likely to have GA alone (20% GA cohort vs. 5.1% RB, $p=0.040$). Patients with RB had shorter time to extubation than GA (84.6% < 12 hours vs. 45.5%, $p<0.001$), less median procedural MME (103 MME vs. 130 MME, $p=0.038$), MME at 1st post-operative day (25 MME vs. 75 MME, $p<0.001$), and discharge MME (142.5 MME vs. 225 MME, $p=0.026$) and overall shorter length of stay (median 5 vs. 7 days, $p<0.001$). Post-operative complications were similar between groups. After exclusion of urgent patients from the cohorts, the above outcomes remained improved in RB patients.

CONCLUSIONS: Patients that receive adjunctive rectus sheath blocks for pain control following OAS utilize less opioid medications during hospital stay and at discharge. This is a valuable tool to enhance post-operative recovery following open aortic surgery.

8:56 am – 9:04 am

23 (RF)

The Impact of HIV on the Prevalence and Characterization of Peripheral Arterial Disease in Kigali, Rwanda: A Pilot Study

Dominique M. Dockery[1], Sai Allu[1], Samuel Nussenzweig[1], Aron H. Licht[1], Ryan Cunningham[1], Jeffrey Slaiby[2], Kyle Denison Martin[3], Carla C. Moreira[2], Robert B. Patterson[3] - [1]Warren Alpert Medical School of Brown University, Providence, RI; [2]Rhode Island Hospital, Providence, RI; [3]Alpert Medical School of Brown University, Providence, RI

INTRODUCTION AND OBJECTIVES: No studies have estimated the prevalence of peripheral arterial disease (PAD) in Rwanda, especially when accounting for the increased rate of human immunodeficiency virus (HIV), which is often associated with an increased risk of PAD. This study sought to estimate the prevalence of PAD stratified by HIV status in Kigali.

METHODS: This is a cross-sectional study conducted at three Kigali health centers. Patients older than 40 presenting non-emergently were eligible for PAD screening. An ankle-brachial index (ABI) was measured using the Unetixs Revo 1100/8 MHz probe. ABI definitions were </=0.9 for diagnostic and >1.3 for inconclusive. Doppler waveforms were also recorded for subsequent analysis. Demographics, HIV status and comorbidities were self-reported by survey.

RESULTS: A total of 859 participants were included with an overall PAD positivity rate of 3.14%. In total, 174 patients were HIV positive (20.3%) and 685 were HIV negative (79.7%). HIV positivity was associated with an inconclusive ABI (44 (25%) vs. 121(18%), p=0.04), while there was no significant association with a diagnostic ABI (3 (1.7%) vs. 24 (3.5%), p=0.45). Additionally, people living with HIV (PLWH) were more likely to be younger (54 vs. 57, p<0.01) and less likely to have other comorbidities like diabetes (27 (16%) vs. 171 (25%), p<0.01) and hypertension (57 (33%) vs. 307 (45%), p<0.01).

CONCLUSION: This study revealed a significantly higher rate of inconclusive ABIs among PLWH in Kigali, Rwanda despite lower rates of diabetes which may suggest calcific vascular disease due to HIV. Further research is warranted to better understand the prevalence and pathophysiology of vascular disease in this population.

Table. Study demographics and prevalence rates based on HIV status

Characteristic	HIV+ (N=174)	HIV- (N=685)	p-value
Age	54 [48 - 60]	57 [48 - 65]	**0.008**
Sex			0.697
Female	132 (76%)	508 (74%)	
Male	42 (24%)	177 (26%)	
ABI			0.0514
ABI 0.9-1.3	127 (73%)	540 (79%)	
ABI </=0.9	3 (1.7%)	24 (3.5%)	0.450
ABI > 1.3	44 (25%)	121 (18%)	**0.040**
T2DM	27 (16%)	171 (25%)	**0.009**
HTN	57 (33%)	307 (45%)	**0.005**
HLD	2 (1.1%)	8 (1.1%)	1.000
CKD	2 (1.1%)	5 (0.73%)	0.634
Prior MI	2 (1.1%)	5 (0.73%)	0.634
Stroke	1 (0.57%)	5 (0.73%)	1.000
Smoking Status			0.851
Current	9 (5.2%)	29 (4.2%)	
Former	48 (28%)	192 (28%)	
Never	117 (67%)	464 (68%)	
Obesity	21 (12%)	113 (16%)	0.162
FH Stroke	6 (3.4%)	20 (2.9%)	0.804
FH Heart Attack	15 (8.6%)	62 (9.1%)	1.000
FH PAD	13 (7.5%)	40 (5.8%)	0.479

Full Program & Abstracts

9:15 am – 10:15 am	**OBL SESSION** Moderators: Todd Berland, MD & Alissa Hart, MD
3:00 pm	Registration Re-Opens
3:00 pm – 4:00 pm	Coffee/Snacks/Visit Exhibitors
3:00 pm – 4:00 pm	**VASCULAR EDUCATION SESSION** Moderators: Gabriela Velazquez, MD & Kedar Lavingia, MD
3:00 pm - 3:12 pm	E1 **Individual and Program-Related Predictors of Academic Vascular Surgery Practice** Andrea Tess Fisher[1], Arash Fereydooni[1], Danielle M. Mullis[1], Brigitte K. Smith[2], Michael D. Sgroi[1] - [1]Stanford University, Stanford, CA; [2]University of Utah, Salt Lake City, UT

INTRODUCTION: Several studies have explored factors affecting academic employment in surgical subspecialties; however, vascular surgery has not yet been investigated. We examined which elements of surgical training predict future academic productivity and studied characteristics of NIH-funded vascular surgery attendings.

METHODS: With approval from the APDVS, the database of recent graduates was obtained and public resources (Doximity, Scopus, PubMed, NIH, etc.) were queried for completion of vascular surgery fellowship (VSF) vs. integrated vascular surgery residency (IVSR), research output during and after training, completion of dedicated research years, individual and program NIH funding, current practice setting and academic rank. Adjusted multivariate regression analyses were conducted for postgraduate academic productivity.

RESULTS: From 2013-2017, there were 724 graduates. 603 completed VSF and 131 IVSR; 220 (29%) were female. Academic employment was predicted by MD degree, advanced degree, training at a top NIH-funded program, number publications by end of training, and H-index. Dedicated research time before or during vascular training, advanced degree, or graduating from a top NIH-funded program were predictors of publishing >1 paper/year. Number of publications by end of training and years in practice were predictive of H-index ≥5. VSF vs. IVSR pathway did not have an impact on future academic employment, annual publication rate as an attending, or H-index. (Table) Characterization of NIH-funded attendings showed that they often completed dedicated research time (72%) and trained at a top NIH-funded program (79%). Mean publications by graduation among this group was 15.82±11.3, and they averaged 4.31±4.2 publications/year as attendings.

CONCLUSION: Research output during training, advanced degrees, and training at a top NIH funded program predict an academic vascular surgery career. VSF and IVSR constitute equally valid paths to productive academic careers.

Table. Predictors of academic employment and research productivity after graduation (*p < 0.05).

	Academic employment		> 1 pub/year as attending		Current H-index ≥ 5	
Predictor	**OR**	**95% CI, P-value**	**OR**	**95% CI, P-value**	**OR**	**95% CI, P-value**
MD degree	3.64	(1.40, 9.50), 0.008*				
Advanced degree	2.37	(1.33, 3.91), 0.001*	2.74	(1.54, 4.89), 0.001*		
Top NIH-funded Surgery Program	1.35	(1, 1.81), 0.048*	1.91	(1.44, 2.53), <0.001*		
Greater # publications by the end of training	1.05	(1.03, 1.07), < 0.001*			1.3	(1.18, 1.43), < 0.001*
Greater # years in practice					1.68	(1.56, 1.81), <0.001*
Research time before vascular training			1.33	(1.08, 1.80), 0.047*		
Research time during vascular training			1.69	(1.07, 3.52), 0.011*		
Current H-index ≥ 5	1.26	(1.18, 1.33), 0.037*				
VSF	1.29	(0.80, 2.09), 0.285	0.92	(0.63, 1.33), 0.220	0.69	(0.35, 1.03), 0.295

3:12 pm - 3:24 pm E2

General Surgery Residents are Still Interested in Vascular Surgery

M. Libby Weaver[2], Gabriella Velazquez Ramirez[3], Peter Nelson[1], Kimberly Zamor[1], William Jennings[1], Kelly Kempe[1] - [1]University of Oklahoma School of Community Medicine, Tulsa, OK; [2]University of Virginia School of Medicine, Charlottesville, VA; [3]Wake Forest School of Medicine, Winston-Salem, NC

INTRODUCTION: Currently there is a scarcity of vascular surgeons and worsening projections continue. Annual assessment of our workforce recruitment and growth is imperative.

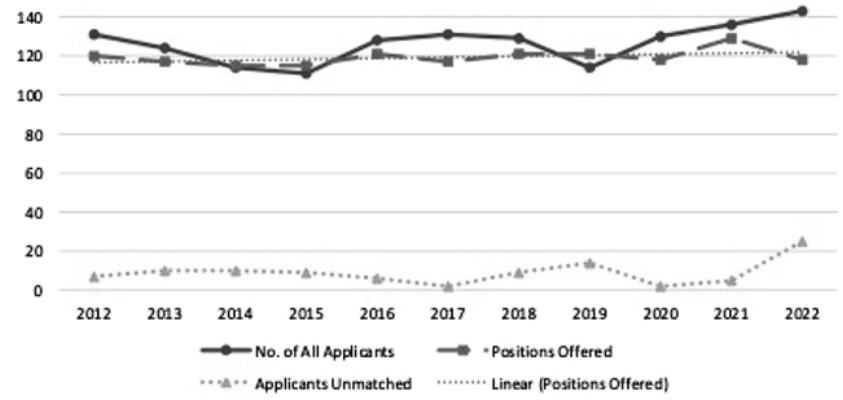
METHODS: Retrospective data was analyzed utilizing the National Resident Matching Program (NRMP) from 2012-2022 applicant appointment years (specialty code for vascular surgery 450). Simple linear annual analysis was performed for all positions offered and stratified by fellowship or residency.

RESULTS: Reviewing the 2022 vascular applicant appointments, 100% of programs filled (94 fellowship and 68 residency). Expansion of residency positions continued, with 56 offered in 2016, 75 in 2020, and 84 available in 2022. Only 25 programs (15%) offered positions for both vascular fellows and residents. The number of fellowship positions has remained stagnant with 118 positions; however, applications rose to 143 with 25 applicants unmatched in 2022 (Figure 1A). The number of unmatched vascular surgery residency applicants remained high at 84, but unlike the fellowship, the number of positions is steadily increasing (Figure 1B). On average, the number of fellowship positions offered increased by 0.5 each year (P-value 0.1617) and the number of residency positions offered increased by 4 each year (P-value <0.0001).

CONCLUSION: Applicants for both vascular tracks have increased since 2019 indicating successful recruitment, but in 2022 all programs filled, leaving many applicants unmatched. Residency positions continue to grow, but fellowship positions do not. With the demonstrated surge in vascular surgery amongst all trainees and the known shortage of surgeons, there is an urgency to adapt to the demand. To do this, a concerted focus should also be made toward adding fellowship positions and programs.

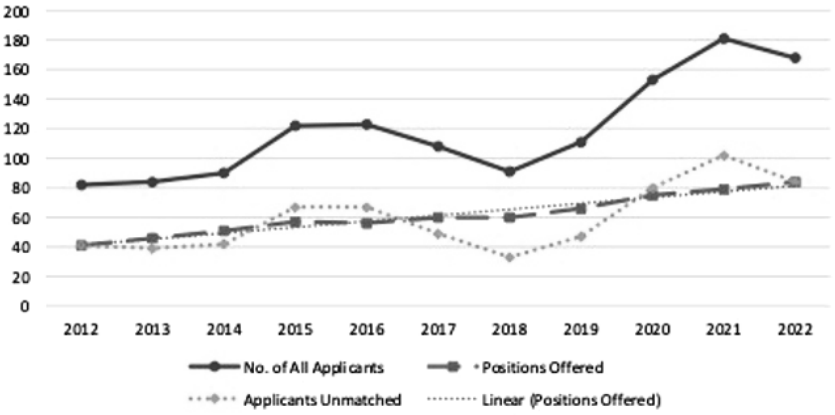
Full Program & Abstracts

Table 1A. Vascular Fellowship Applicants and Positions



- No. of All Applicants—Number of all vascular surgery fellowship applicants
- Positions Offered—Positions available by year for the fellowship
- Applicants Unmatched—All applicants for vascular surgery fellowship who went unmatched
- Linear—Linear trend line for vascular fellowship

Table 1B. Vascular Residency Applicants and Positions from 2012-2022



- No. of All Applicants—Number of all vascular surgery residency applicants
- Positions Offered—Number of positions available by year for the residency
- Applicants Unmatched—All applicants for vascular surgery residency who went unmatched
- Linear—Linear trend line for vascular residency

3:24 pm - 3:36 pm

E3

Fourth Year Medical Students' Perceptions of Vascular Surgery: Can We Improve the Pipeline?

Tyler Arismendi[1], Nicholas Schaper[1], Saideep Bose[1], Konstantinos C Karabetsos[2], Ali Syed[2], Rheyana Branch[3], Marvi Moreno[4], Cole Pickney[5], Ikpechukwu Obayi[6], Spencer J Lucas[7], Eduardo González[8], Aaron Graves[9], Brittany Kauffman[10], Alexandra Maningat[11], Tara Zielke[12], Janice Nam[12], Michael Soult[12], Faisal Aziz[13], Matthew R. Smeds[1] - [1]Saint Louis University School of Medicine, Saint Louis, MO; [2]Medical College of Wisconsin, Milwaukee, WI; [3]University of Louisville School of Medicine, Louisville, KY; [4]Kirk Kerkorian School of Medicine at the University of Nevada, Las Vegas, NV; [5]Case Western Reserve University School of Medicine, Cleveland, OH; [6]City University of New York (CUNY) School of Medicine, New York, NY; [7]University of South Dakota Sanford School of Medicine, Vermillion, SD; [8]Universidad Central del Caribe, Bayamón, PR; [9]Kansas City University College of Osteopathic Medicine, Kansas City, MO; [10]Arkansas College of Osteopathic Medicine, Fort Smith, AR; [11]University of the Incarnate Word School of Osteopathic Medicine, San Antonio, TX; [12]Loyola University Chicago Stritch School of Medicine, Maywood, IL; [13]Penn State College of Medicine, State College, PA

INTRODUCTION AND OBJECTIVES: Despite changes in vascular surgery training paradigms and attraction of competitive applicants, shortages of vascular surgeons are projected through 2050. We aimed to determine fourth -year medical students' knowledge/perceptions of vascular surgery (VS).

METHODS: Anonymous/electronic questionnaires were sent to fourth-year medical students at five allopathic medical schools, with questions detailing demographics, specialty preferences, and exposure to/perceptions of vascular surgery. Descriptive statistics were obtained, and responses were compared between students applying to surgical (SS) and non-surgical specialties (NSS).

RESULTS: 121/817 (14.8%) participants responded (55% female). 63% reported VS exposure, most commonly during the first and third years, and 22% considered a VS career. 42/121 (35%) planned applying to SS. 62% of respondents reported knowledge of management of vascular disease, and 69% understood procedures vascular surgeons performed. Ranking the importance of factors in choosing specialties, SS selected "Experiences gained during rotations" ($p<0.05$) and "Types/variety of modalities used" ($p<0.001$) as highest priorities (Table). NSS preferred "Lifestyle as attending" ($p<0.001$)

and "Interest in the pathology/diseases treated." 48% of respondents thought vascular surgeons have worse quality of life compared to other physicians, with NSS more likely to agree ($p<0.05$). Only 8% of respondents believed vascular surgeons have good work/life balance. Stratified by gender, female students rated "Gender-related concerns, such as discrimination at work or unfair career possibilities" ($p<0.001$) and "Fear of unfair competition" ($p<0.05$) as potential negative aspects of VS careers.

CONCLUSIONS: Medical students perceive poor quality of life and work/life balance of vascular surgeons. Opportunities exist to educate students about pathologies treated/procedures performed by vascular surgeons and attainable quality of life. These insights may help develop recruitment strategies to stimulate student interest in VS.

Rank the Importance of the Following Factors in Your Specialty Selection.				
	Total Respondents Mean Ranking ($n = 121$)	SS Respondents Mean Ranking ($n = 42$)	NSS Respondents Mean Ranking ($n = 79$)	*P*-value
Mentorship before or during medical school	6.04	5.31	6.43	**0.050**
Projected income of this field	7.01	7.05	6.99	0.748
Lifestyle (work/life balance) during training	6.24	8.24	5.18	**< 0.001**
Lifestyle (work/life balance) as an attending	4.25	6.17	3.23	**< 0.001**
Competitiveness of The Match	7.91	8.00	7.86	0.748
Length of residency training	7.37	8.26	6.90	**0.003**
Experiences gained during medical school rotations	4.13	3.33	4.56	**0.017**
Patient population treated by this field	4.85	4.21	5.19	0.068
Prestige of field	8.88	8.14	9.28	**0.016**
Interest in the pathology or disease processes treated	4.30	3.81	4.56	0.179
Types and/or variety of treatment modalities used in this field	5.02	3.48	5.84	**< 0.001**

Rate the Following Statements in Regard to How Much You Agree with Them.						
	Total Agree ($n = 121$)	SS Agree ($n = 42$)	SS Disagree ($n = 42$)	NSS Agree ($n = 79$)	NSS Disagree ($n = 79$)	*P*-value
"I know about the medical management of vascular disease."	76	29	13	47	29	0.561
"I know which diseases are treated by vascular surgeons."	84	32	10	52	24	0.497
"I know which procedures are performed by vascular surgeons."	72	29	13	43	33	0.257
"I know about the lifestyle of vascular surgeons."	48	15	27	33	43	0.535
"Vascular surgeons have a worse quality of life compared to other physicians."	58	12	30	46	30	**0.002**
"Vascular surgeons have a worse quality of life compared to other surgeons."	34	7	13	27	49	0.051

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Rate the Following Statements About Your Perceptions of Vascular Surgeons.						
	Total Agree (n = 121)	SS Agree (n = 42)	SS Disagree (n = 42)	NSS Agree (n = 79)	NSS Disagree (n = 79)	P-value
"Vascular surgeons have a good work/life balance."	10	8	34	2	74	**0.007**
"Vascular surgeons have personalities that are easy to get along with."	18	10	32	8	67	0.105
"Vascular surgeons are leaders of the healthcare team."	36	17	25	19	56	0.135
"Vascular surgeons are appeopriately compensated for the work they perform."	56	25	17	31	44	0.090
"Vascular surgeons are respectful to all members of the healthcare team."	32	15	27	17	58	0.193
Rate the Following Statements About Your Perceptions of a Career in Vascular Surgery (VS).						
	Total Agree (n = 121)	SS Agree (n = 42)	SS Disagree (n = 42)	NSS Agree (n = 79)	NSS Disagree (n = 79)	P-value
"A career in VS offers an intellectual challenge."	95	38	4	57	19	0.074
"A career in VS offers opportunities to impact patient lives directly."	106	40	1	66	10	0.118
"A career in VS offers support for research activities."	92	38	4	54	22	**0.027**
"A career in VS offers opportunities for leadership/administrative advancement."	80	35	7	45	31	**0.013**
"A career in VS offers opportunities for medical education involvement."	88	37	5	51	25	**0.022**
"A career in VS offers adequate time for family/life activities."	19	12	30	7	69	**0.013**

3:36 pm - 3:48 pm E4

Patterns in Complex Aortic Vascular Surgery Training

Nallely Saldana-Ruiz, Osarumen Okunbor, Betka Douglas, Matthew Smith, Elina Quiroga, Niten Singh, Sara L Zettervall - University of Washington, Seattle, WA

INTRODUCTION AND OBJECTIVES: Recent literature suggests a decreasing experience with open aortic surgery among recent vascular surgery graduates. While trainees have a wide exposure to EVAR, experience with the management of thoracoabdominal aneurysms, and young surgeon comfort in early practice remains unknown. Thus, we sought to evaluate early practice patterns in the treatment of complex aortic surgery among recent U.S. vascular surgery graduates.

METHODS: An anonymous survey was distributed by email to all vascular surgeons who completed vascular surgery residency or fellowship between 2016 to 2020. Self-reported data assessed the number and type of cases performed in training, surgeon experience in early practice, and surgeon desire for additional training in these areas. The APDVS and institutional IRB approved this study.

RESULTS: 121 surgeons completed the survey including 62 from the class of 2020. 78% of respondents completed fellowship training, and 84% self-described as training in an academic environment. 58% percent performed less than 5 open thoracoabdominal aortic surgeries and 64% performed less than 5 multi-vessel branched/fenestrated aortic repairs, including 64% who completed less than 5 physician modified endovascular grafts repairs. For both open and endovascular complex aortic procedures, most respondents plan to perform such procedures with a partner in their current practice, and the majority desired additional open (56%) and (51%) endovascular training for the treatment of thoracoabdominal aneurysms.

CONCLUSIONS: The reported infrequency in open thoracoabdominal and multi-vessel branched/fenestrated aortic repair training highlights a desire and utility for advanced aortic training program for surgeons wishing to focus on this area of vascular surgery. The creation of these programs may provide pivotal opportunity, as vascular surgery and the management of complex aortic pathology continues to evolve.

Table. Survey Results

Vascular surgery training pathway	**(N)**	**(%)**
5 + 2 program	94	78%
Type of training program		
Academic	100	83%
Number of open aortic procedures in training		
< 5	6	5%
5 – 20	22	18%
21 – 30	56	46%
> 40	37	31%
Number open thoracoabdominal aortic procedures		
< 5	70	58%
Area for additional complex open aortic surgery training		
Thoracoabdominal aortic aneurysms	73	62%
Abdominal aortic aneurysms with supra-celiac clamping	45	38%
Abdominal aortic aneurysms with suprarenal clamping	23	19%
Abdominal aortic aneurysms with infrarenal clamping	14	12%
None of the above	36	31%
Number of Physician Modified Endografts		
< 5	77	64%
Number of branched or fenestrated procedures (ex. 4 vessel branched / fenestrated or custom devices)		
< 5	77	64%
Desire additional training in complex open aortic surgery		
Yes	67	56%
Desire for additional training in complex endovascular aortic surgery		
Yes	61	51%

Full Program & Abstracts

4:00 pm – 6:00 pm **SCIENTIFIC SESSION III**
Moderators: Jordan Stern, MD & Yazan Duwayri, MD

4:00 pm – 4:12 pm 24
5-Year Outcomes of Elective Endovascular Versus Open Repair of Popliteal Artery Aneurysms in the VISION Database
Keyuree Satam[1], Anand Brahmandam[1], Xinyan Zheng[2], Jialin Mao[2], Raul J Guzman[1], Philip Goodney[3], Cassius I. Ochoa Chaar[1] - [1]Yale School of Medicine, New Haven, CT; [2]Weill Cornell Medicine, New York, NY; [3]Dartmouth-Hitchcock Medical Center, Lebanon, NH

INTRODUCTION AND OBJECTIVES: The best modality for elective popliteal aneurysm repair (PAR) remains controversial. Most single center studies suggest open repair (OPAR) is more durable than endovascular (EPAR), but large randomized multicenter studies are lacking. This study compares long-term outcomes of EPAR and OPAR in the VISION database.

METHODS: Medicare-linked VISION database (2010-2019) for peripheral vascular interventions and infrainguinal bypass was reviewed for elective PAR. Patients undergoing OPAR and EPAR were propensity-matched to compare outcomes.

RESULTS: There were 1,159 PAA repairs (65.1% open). EPAR patients were older (77 vs. 73 years, $p<0.001$) and more likely to be on P2-Y12 inhibitors (26.5% vs. 17.0%, $p<0.001$) (Table 1). After matching, EPAR patients were more likely to be discharged home (87.6% vs 48.5%, $p<0.001$) and have shorter hospital length-of-stay (1 vs. 3 days, $p<0.001$). Kaplan-Meier curves showed no difference in mortality, reintervention, or major amputation at 1, 3, and 5 years (Figure). Cox proportional hazards regression showed no difference in mortality and the risks of reintervention and major amputation between the 2 groups. Analysis of patients undergoing OPAR with great saphenous vein (GSV) bypass compared to EPAR showed that OPAR was associated with lower mortality without difference in reintervention or major amputation (Table 2).

CONCLUSIONS: Elective EPAR is durable and comparable to OPAR, even with GSV as conduit. Selection bias likely drives increased late mortality with EPAR.

Full Program & Abstracts

Table 1.

CHARACTERISTICS	Before Match			After Match		
	Open N=755 (65.1%)	Endovascular N=404 (34.9%)	P-Value	Open N=396 (50%)	Endovascular N=396 (50%)	Standardized Mean Difference
DEMOGRAPHICS						
Age	73 (68-79)	77 (71-82)	**<0.001***	76 (70-81)	77 (71-82)	0.123
Male	726 (96.2)	387 (95.8)	0.76	378 (95.5)	379 (95.7)	0.012
Race: White	712 (94.3)	375 (92.8)	0.32	372 (93.9)	369 (93.2)	0.031
BMI: Obese	487 (64.5)	255 (63.1)	0.64	263 (66.4)	251 (63.4)	0.064
COMORBIDITIES						
Coronary Artery Disease	213 (28.2)	130 (32.3)	0.15	135 (34.1)	128 (32.3)	0.038
Congestive Heart Failure	90 (11.9)	60 (14.9)	0.16	53 (13.4)	59 (14.9)	0.044
Chronic Obstructive Pulmonary Disease	198 (26.2)	103 (25.5)	0.79	101 (25.5)	102 (25.8)	0.006
Diabetes	184 (24.4)	100 (24.8)	0.89	101 (25.5)	98 (24.7)	0.018
Smoking			0.48			0.104
Never	181 (24.0)	110 (27.2)		96 (24.2)	107 (27.0)	
Prior	410 (54.3)	210 (52.0)		203 (51.3)	207 (52.3)	
Current	164 (21.7)	84 (20.8)		97 (24.5)	82 (20.7)	
Kidney Dysfunction	90 (12.0)	59 (14.8)	0.18	55 (13.9)	59 (14.9)	0.029
MEDICATION						
Statin	543 (71.9)	297 (73.5)	0.56	281 (71.0)	293 (74.0)	0.068
ASA	547 (72.5)	281 (69.6)	0.30	289 (73.0)	278 (70.2)	0.062
P2Y-12 Inhibitor	128 (17.0)	107 (26.5)	**<0.001***	97 (24.5)	107 (27.0)	0.058

Table 2.

OUTCOMES	Before Match				After Match			
	HR	95% lower limit	95% upper limit	P-value	HR	95% lower limit	95% upper limit	P-value
OPAR Any Conduit vs. EPAR								
Mortality	0.63	0.50	0.81	**<0.001***	0.80	0.61	1.05	0.104
Reintervention	1.01	0.83	1.23	0.920	1.04	0.83	1.30	0.750
Major Amputation	0.78	0.36	1.66	0.510	0.99	0.45	2.18	0.988
OPAR with GSV vs. EPAR								
Mortality	0.58	0.45	0.75	**<0.001***	0.69	0.52	0.93	**0.014***
Reintervention	1.01	0.82	1.24	0.926	1.01	0.80	1.28	0.924
Major Amputation	0.67	0.29	1.55	0.350	0.63	0.22	1.81	0.392

Figure A. Failure Curve of Death, Matched Cohorts (with Number of Subjects at Risk and 95% Confidence Limits)

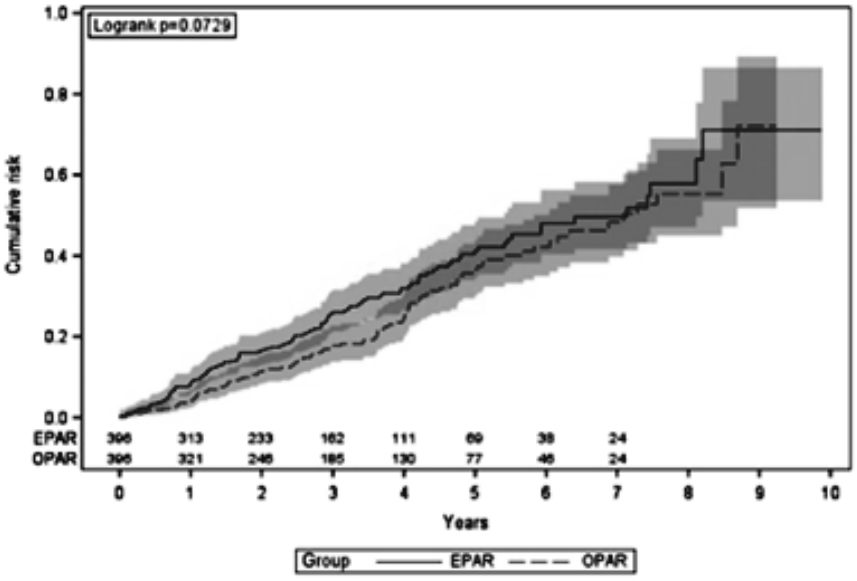
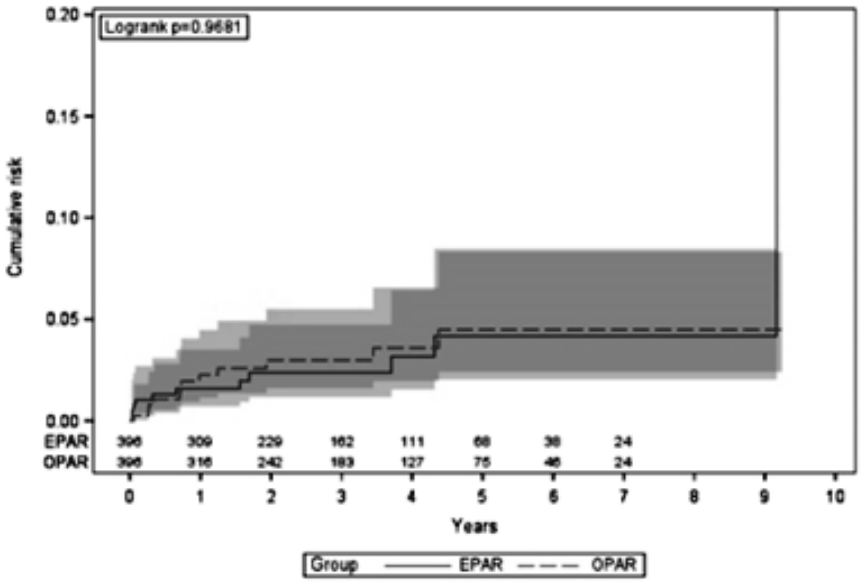


Figure B. Failure Curve of Amputation , Matched Cohorts (with Number of Subjects at Risk and 95% Confidence Limits)



4:12 pm – 4:24 pm

25

Implementation of Quality Improvement Protocol to Decrease Length of Stay after Elective Carotid Endarterectomy

Zach M. Feldman, Srihari Lella, Sujin Lee, Anahita Dua, Sunita D. Srivastava, Matthew J. Eagleton, Glenn M. LaMuraglia, Nikolaos Zacharias - Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: National guidelines stipulate that post-operative length of stay (LOS) after elective carotid endarterectomy (CEA) should not exceed one day, yet perioperative factors may limit institutions progress toward this goal. We designed and implemented a quality improvement (QI) protocol aiming to improve institutional performance in post -operative LOS after CEA.

METHODS: Two PDSA (Plan-Do-Study-Act) cycles were developed targeting urinary retention and post-operative hypertension, found to frequently extend LOS on internal review. First, antihypertensive medications were managed according to a standardized protocol from pre-operative day #1 to post-operative day (POD) #1, with dedicated patient outreach for ambulatory antihypertensive management. Second, alpha-1-blockade was administered to male patients pre-operatively. Outcome measures were defined as percent failure of the LOS >1 day metric, with raw LOS as a secondary measure. Process measures included antihypertensive protocol adherence and alpha-1-blockade adherence. Fisher's exact and Wilcoxon rank-sum tests evaluated relationships between pre-intervention and post-intervention cohorts and the outcome measures.

RESULTS: Baseline prior 12-month performance on the LOS >1 day measure was 52.4%. PDSA interventions were implemented simultaneously. Post-interventions, 34 patients met protocol inclusion criteria across 6 months, with 8 symptomatic patients. Adherence to the antihypertensive protocol was 93.5%. Pre-operative alpha-1-blockade process measure success was 77.8%. An intraoperative hypotension balance measure occurred in zero patients. Performance on the LOS >1 day outcome measure improved to 32.4% ($p=0.07$), although this did not reach statistical significance. Median raw LOS was similar between pre- and post-intervention cohorts (2 days, interquartile range [IQR] 1-2 versus 1 day, IQR 1-2, respectively $p=0.20$).

CONCLUSIONS: The development and implementation of a QI protocol to reduce post-operative LOS after CEA showed promising results in our institution, with nearly 40% improvement in the primary outcome measure. Wider efforts to improve LOS after CEA should include a focus on minimization of post-operative hypertension and urinary retention.

4:24 pm – 4:36 pm

26

Effects of Timing of Repair on Mortality Following Thoracic Endovascular Aortic Repair for Blunt Thoracic Aortic Injury

Charles S. Marquardt, Saideep Bose, Matthew R. Smeds - Saint Louis University Hospital, Saint Louis, MO

INTRODUCTION AND OBJECTIVES: Blunt thoracic aortic injuries (BTAI) are traditionally treated as emergencies with most fixed within 24 hours of arrival by thoracic endovascular aortic repair (TEVAR) regardless of grade of injury. However, the optimal timing of repair remains debated.

METHODS: All patients with grade II and III BTAI enrolled in the Aortic Trauma Foundation prospective multi-center registry from 2015 to 2022 were categorized dependent on timing of repair (ER = Early Repair <24 hours, LR = Late Repair >24 hours). Chi-square/Fisher's exact tests were used to compare patient/operative factors and logistic regression analysis was performed to identify factors related to 30-day mortality.

RESULTS: 222 Grade II and III BTAI treated by TEVAR were analysed, with 179 in the ER group (81%). There was no difference between the groups regarding Injury Severity Score (ISS), Glasgow Coma Scale (GCS), age, or gender. Those in ER were more likely to have a widened mediastinum and a shorter distance from the left subclavian artery to the injury. 30-day in-hospital mortality occurred in 14 patients (6%); 2 of which were aortic-related. 30-day mortality was associated with a higher baseline incidence of CAD/PVD/ previous cardiac revascularisation; lower systolic blood pressure, GCS, hemoglobin, platelet count and blood pH; and higher lactate and ISS on arrival. On multivariate regression analysis, lower haemoglobin, higher ISS, and Grade III BTAI were associated with 30-day mortality ($p<0.05$), although time to TEVAR was not.

CONCLUSIONS: In selected patients, delay in performance of TEVAR for Grade II & III BTAI may be possible. Further research is necessary to identify other factors predictive of success.

4:36 pm – 4:48 pm

27

Precocious Rupture of Abdominal Aortic Aneurysms Below Size Criteria for Repair: Risk Factors and Outcomes

Elizabeth L. George[1], Justin A. Smith[2], Benjamin Colvard[2], Jason T. Lee[1], Jordan R. Stern[1] - [1]Stanford University, Stanford, CA; [2]Harrington Heart and Vascular Institute, University Hospitals Cleveland Medical Center, Cleveland, OH

INTRODUCTION: Practice guidelines recommend elective repair for abdominal aortic aneurysms (AAA) ≥5.5cm in men and ≥5cm in women to prevent rupture. However, some rupture at smaller diameters. We identify risk factors for precocious rupture (rAAA) below this threshold and compare outcomes following rAAA repair above/below size criteria.

METHODS: The Vascular Quality Initiative (2013-2019) was queried for patients undergoing repair for rAAA and stratified based on diameter into SMALL and LARGE cohorts [SMALL: <5.5cm (men), <5.0cm (women)]. Univariate analysis was performed, and Kaplan-Meier analysis compared overall survival, aneurysm-related mortality, and reintervention at 12-months.

RESULTS: 5,162 rAAA were identified. SMALL rAAA patients [n = 588] were more likely to have hypertension (81.3% vs. 77.0%, p<0.02), diabetes (18.2% vs. 14.9%, p<0.04), and ESRD (2.9% vs. 0.9%, p<0.01), and be on optimal medical therapy (32.1% vs. 26.8%, p<0.01). Women were more likely to rupture at smaller diameters and below size criteria compared to men (Figure 1, p<0.01). SMALL patients were more likely to undergo EVAR (70.2% vs. 56%, p<0.01), and had lower in-hospital mortality (17.7% vs. 27.7%, p<0.01), and fewer perioperative complications across all categories. At 12-months, SMALL patients had better overall survival, freedom from aneurysm-related mortality, and freedom from reintervention (Figure 2), largely driven by EVAR approach.

CONCLUSION: SMALL rAAA patients experienced lower in-hospital morbidity and mortality and improved 1-year survival, and EVAR was associated with better outcomes than open repair. Women appear to rupture at smaller diameters and below size criteria, suggesting the need to reevaluate our dogmatic, sex-specific size thresholds.

Figure 1. Sex differences in ruptured AAA maximum diameter. Women more likely to rupture at smaller maximum AAA diameters and below elective repair thresholds compared to men.

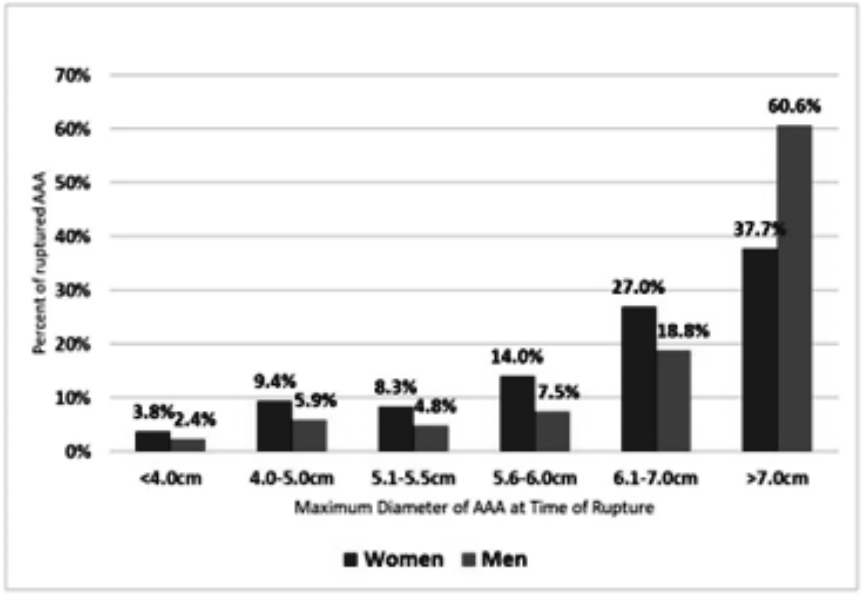
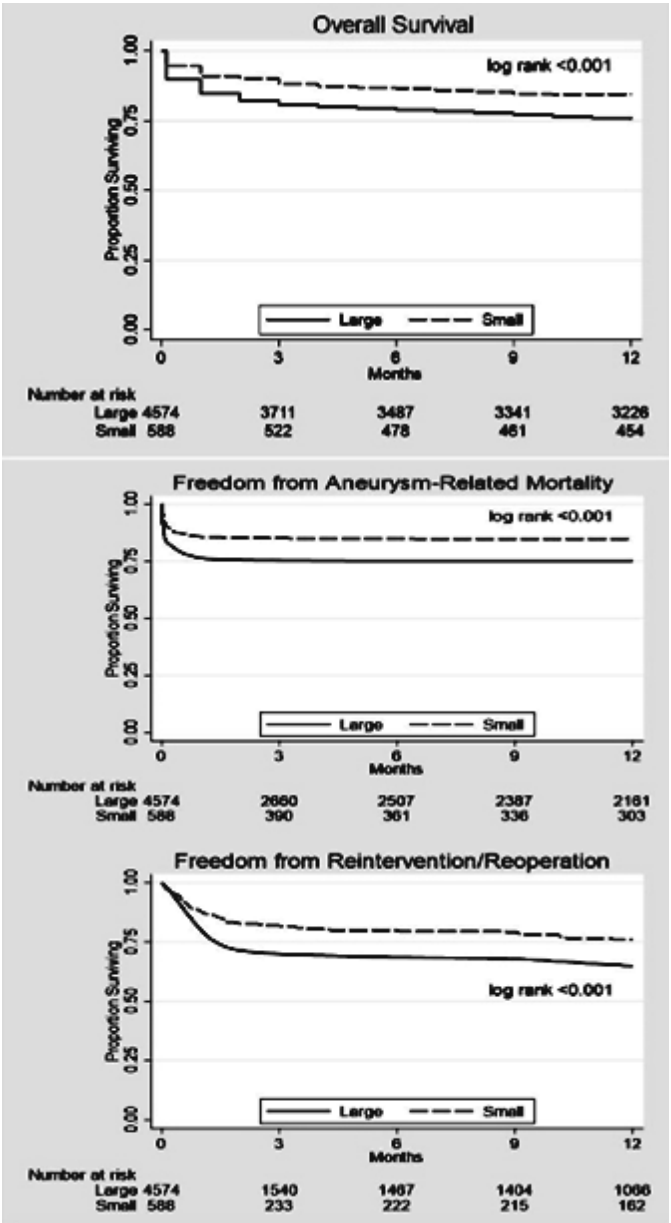


Figure 2. Kaplan-Meier analysis and log rank test of 12-month overall survival stratified by aneurysm size at time of rupture and operative approach.



4:48 pm – 4:56 pm

28 (RF)

Utilizing Mobile Diabetic Foot Clinics to Provide Comprehensive Care to Patients Experiencing Homelessness

Kris M. Boelitz[1], Jaeyoung Lee[1], Colby Cayton[2], Mallory Gibbons[3], Jessin Varghese[1], Frances Lagana[1], Shahida Balaparya[1], Kavita Babu[1], Jessica P. Simons[1], Douglas W. Jones[1], Andres Schanzer[1], Tammy T Nguyen[1] - [1]University of Massachusetts Medical School, Worcester, MA; [2]Maine Medical Center, Portland, ME; [3]Vascular Care Group, Worcester, MA

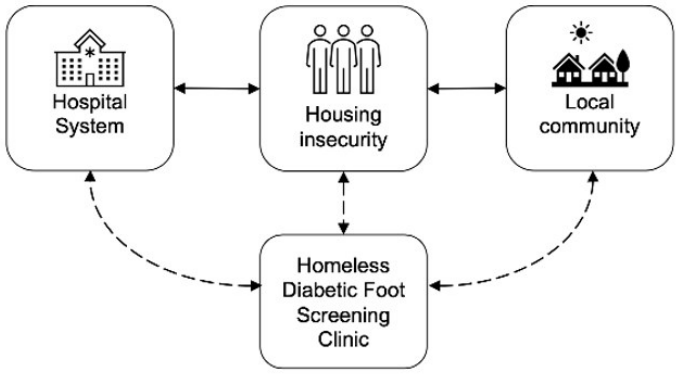
INTRODUCTION AND OBJECTIVES: Limited healthcare access and resource inequities pose significant barriers to care, all of which have been amplified during the COVID-19 pandemic. DFUs represent an especially challenging medical problem to prevent and treat due to the resource intensive care required. We sought to evaluate the feasibility of multidisciplinary, mobile, DFU outreach clinics to improve access to care.

METHODS: Our clinic model focused on creating mobile diabetic foot clinics staffed by volunteer clinical providers who specialize in Vascular Surgery, Diabetes, and Podiatry. We recruited volunteer healthcare providers from an academic medical center. We partnered with local community centers with established programs providing services to unhoused individuals.

RESULTS: Between June 2020 and August 2022, a total of 130 unhoused individuals were seen at four mobile clinics set up at different locations. Diabetic foot care was provided by volunteers from seven departments: Endocrinology/Diabetes, Vascular Surgery and Vascular Lab, Podiatry, Addiction Medicine, Smoking Cessation, and Financial. On average, 32 healthcare provider volunteers participated at each clinic. Services provided include: vitals, blood glucose, HgA1c, lipid panel testing, ankle-brachial index, podiatric exam, wound care, medical education, COVID vaccination/booster, insurance enrollment, and new socks and shoes. Of 130 unhoused patients, 29% had hypertension (38), 34% had abnormal ABI (44), and 14% had diabetes (18). Fifteen patients were further identified as high risk for developing DFU-associated amputation (12%) and were provided with ambulatory follow-ups.

CONCLUSIONS: In our pilot experience, it is feasible to provide consistent comprehensive DFU care through mobile outreach clinics. By using the infrastructure of partner organizations and healthcare expertise of an academic center, our clinics could integrate into existing community services.

Figure. Our approach closes a crucial gap between multidisciplinary centers and community efforts to provide comprehensive care to the housing insecure.



Full Program & Abstracts

4:56 pm – 5:04 pm

29 (RF)

Intraoperative Infusion of Dextran Confers No Additional Benefit after Carotid Endarterectomy but is Associated with Increased Major Adverse Cardiac Events

Jessica M. Moore[1], Karan Garg[2], Igor Laskowski[3], Thomas Maldonado[2], Romeo Mateo[3], Sateesh Babu[3], Arun Goyal[3], Daniel Ventarola[3], Heepeel Chang[3] - [1]New York Medical College, Valhalla, NY; [2]NYU Langone Medical Center, New York, NY; [3]Westchester Medical Center, New York Medical College, Valhalla, NY

OBJECTIVES: Several studies have shown the potential efficacy of dextran therapy to reduce an embolic risk in patients undergoing carotid endarterectomy (CEA). Nonetheless, dextran has been associated with adverse reactions including anaphylaxis, hemorrhage, cardiac and renal complications. Herein, we aimed to compare the perioperative outcomes of CEA stratified by the use of dextran using a large multi-institutional dataset.

METHODS: Patients undergoing CEA between 2008 and 2022 from the Vascular Quality Initiative database were reviewed. Patients were categorized by use of intraoperative dextran infusion, and demographics, procedural data and in-hospital outcomes were compared.

RESULTS: Of 140,893 patients undergoing CEA, 9935 (7.1%) patients had intraoperative dextran infusion. Patients with dextran infusion were older with lower rates of symptomatic stenosis (24.7% vs. 29.3%; P<.001) and pre-operative use of antiplatelets, anticoagulants and statins. Additionally, they were more likely to have severe carotid stenosis (49% vs. 45%; P<.001) and undergo CEA under general anesthesia ((96.4% vs. 92.3%; P<.001) with more frequent use of shunt (64.4% vs. 49.5%; P<.001). After adjustment, dextran infusion was associated with higher odds of myocardial infarction (OR: 1.76, 95% CI: 1.34-2.3, P<.001), congestive heart failure (OR: 2.15, 95% CI: 1.67-2.77, <P.001) and hemodynamic instability requiring vasoactive agents (OR: 1.08, 95% CI: 1.03-1.13, P=.001). However, it was not associated with decreased odds of stroke and death (Table). These trends persisted even when stratified by symptomatic status and degree of stenosis.

CONCLUSIONs: Intraoperative infusion of dextran was associated with increased odds of major adverse cardiac events without decreasing the risk of stroke. These results suggest judicious use of dextran in patients undergoing CEA. Furthermore, careful perioperative cardiac management is warranted in select patients receiving dextran.

Table. In-hospital outcomes and multivariable analysis of patients with and without intraoperative use of dextran infusion undergoing carotid endarterectomy .

	Dextran	No dextran	*P* value	Adjusted odd ratio[1]	95% confidence interval	*P* value
Primary outcomes						
Stroke	85 (0.9)	1175 (0.9)	.67	0.92[2]	0.74-1.16	.489
Death	23 (0.2)	349 (0.3)	.512	0.88[3]	0.58-1.35	.554
MI	61 (0.6)	463 (0.4)	<.001	1.76[3]	1.34-2.3	<.001
Secondary outcomes						
Stroke/death	105 (1.1)	1419 (1.1)	.803	0.95[3]	0.77-1.16	.598
Stroke/death/MI	160 (1.6)	1817 (1.4)	.069	1.15[3]	0.97-1.35	.105
Congestive heart failure	71 (0.7)	425 (0.3)	<.001	2.15[3]	1.67-2.77	<.001
Dysrhythmia	158 (1.6)	1709 (1.3)	.017	1.17[3]	0.99-1.39	.062
Reperfusion syndrome	11 (0.1)	191 (0.1)	.372	0.74[3]	0.39-1.39	.344
Hemodynamic instability	3022 (30.5)	37793 (28.9)	.001	1.08[3]	1.03-1.13	.001
Major bleeding	93 (0.9)	1311 (1)	.529	0.98[3]	0.79-1.21	.832

[1]Those not receiving intraoperative dextran as a reference group [2]Adjusting for age, sex, ethnicity, diabetes, smoker, ambulatory status, ipsilateral stenosis, symptomatic status, anesthesia type, treatment type, shunt, ASA, P2Y12, statin, ACE inhibitor, anticoagulation [3]Adjusting for age, sex, ethnicity, diabetes, smoker, ambulatory status, ipsilateral stenosis, symptomatic status, anesthesia type, treatment type, shunt, ASA, P2Y12, statin, ACE inhibitor, BB, anticoagulation

5:04 pm – 5:12 pm

30 (RF)

Renal Disease and Congestive Heart Failure are Risk Factors for Urgent Endovascular Repair in Patients Under Active Surveillance for Thoracic and Thoracobdominal Aortic Aneurysms

Jonathan R. Krebs, Brian Fazzone, Erik M. Anderson, Walker Ueland, John R. Spratt, Martin R. Back, Zain Shahid, Gilbert R. Upchurch, Jr., Michol A. Cooper - University of Florida, Gainesville, FL

INTRODUCTION AND OBJECTIVES: Outcomes after urgent thoracic endovascular aortic repair (TEVAR) and/or fenestrated-EVAR (FEVAR) are worse compared to elective intervention. We described demographic factors associated with urgent TEVAR and/or FEVAR, with further analysis of patients presenting urgently despite active aneurysm surveillance.

METHODS: Demographic and outcome data were collected retrospectively for patients undergoing TEVAR±FEVAR for aneurysm disease at a single institution between 2011-2020. Univariate and multivariate analyses were used to compare patients. Active surveillance was defined as routine imaging and clinic follow-up within 12 months of presentation.

RESULTS: 441 patients underwent TEVAR±FEVAR. 109 (25%) required urgent intervention. Self-pay/Medicaid payer status (14%v4%, p<0.001), Black race (15%v8%, p=0.031), renal disease (RD) (29%v19%, p=0.024), CHF (23% v11%, p=0.002), and first-time aortic surgery (63%v54%, p=0.020) were associated with urgent presentation (Table 1). Self-pay/Medicaid (OR3.36[1.48 -7.64]95%CI, p=0.012) was an independent predictor of urgent presentation. 40 (37%) urgent patients were under active surveillance at time of presentation. Compared to patients who underwent elective intervention, urgent patients under active surveillance were more often self-pay/Medicaid (13%v4%, p=0.05) and affected by RD (48%v24%, p=0.002) and CHF (33%v16%, p=0.022) (Table 2). CHF (OR2.58[1.25-5.33 95% CI], p=0.032) and RD (OR2.89[1.48-5.64 95% CI, p=0.011) were independent predictors of urgent presentation in patients under active surveillance. Urgent patients had longer ICU admission (8.7v4.7days, p<0.001), greater risk of non-home discharge (52%v33%, p<0.001), and worse 1-year survival (60%v75%, p<0.001).

CONCLUSIONS: Patients with actively surveilled aneurysms who have renal disease and CHF are at increased risk for urgent presentation. Further investigation into the optimal timing for intervention in patients with these risk factors is warranted.

Table 1. Comparison of demographics and comorbidities in TEVAR/FEVAR patients with elective and urgent presentations.

	All Patients (n = 441), %	Elective (n = 331), %	Urgent (n = 109), %	P-value
Demographics				
Age, mean (SD)	72.1 (9.7)	72.5 (8.5)	70.8 (12.5)	0.06
Female sex	139 (32)	100 (30)	39 (36)	0.33
White	373 (86)	291 (88)	82 (75)	0.03*
Black	42 (10)	26 (8)	16 (15)	
Self-pay/Medicaid	28 (6)	13 (4)	15 (14)	<0.001*
Area Deprivation Index (SD)	63 (24)	62 (24)	65 (23)	0.08
Surgery				
TEVAR Only	227 (51)	163 (50)	64 (59)	
TEVAR + FEVAR	108 (25)	81 (24)	27 (25)	
FEVAR Only	105 (24)	87 (26)	18 (16)	
1V FEVAR	7 (3)	4 (2)	3 (7)	
2V FEVAR	16 (8)	13 (8)	7 (16)	
3V FEVAR	37 (17)	32 (10)	8 (18)	
4V FEVAR	139 (60)	116 (69)	27 (59)	
5V FEVAR	3 (1)	3 (2)	0 (0)	

	All Patients (n = 441), %	Elective (n = 331), %	Urgent (n = 109), %	P-value
Comorbidities				
COPD	151 (34)	106 (32)	45 (41)	0.1
Diabetes	59 (13)	41 (12)	18 (17)	0.4
Liver disease	10 (3)	2 (1)	8 (7)	0.1
Chronic kidney disease	96 (22)	62 (19)	32 (29)	0.02*
Myocardial infarction	54 (12)	42 (13)	12 (11)	0.8
Cerebrovascular disease	39 (9)	25 (8)	14 (13)	0.1
Congestive heart failure	60 (14)	35 (11)	25 (23)	0.002*
Hypertension	283 (64)	291 (88)	95 (87)	1.0
Active smoker	102 (23)	73 (22)	29 (27)	0.4
Prior aortic operation	192 (44)	152 (46)	40 (37)	0.02*

Table 2. Comparison of demographics and comorbidities in TEVAR/FEVAR patients with elective presentation and patients under active surveillance that presented urgently.

	Elective (n = 331), %	Active Surveillance, Urgent Presentation (n = 40), %	Univariate P-value	Multivariate P-value
Demographics				
Age, mean (SD)	72.5 (8.5)	70.4 (12.3)	0.1	0.2
Female sex	100 (30)	15 (38)	0.5	
White	291 (88)	31 (78)	0.4	
Black	26 (8)	5 (13)		
Self-pay/Medicaid	13 (4)	5 (13)	0.05 *	
Area Deprivation Index (SD)	62 (24)	72 (22)	0.008*	0.1
Surgery				
TEVAR Only	163 (50)	20 (50)		
TEVAR + FEVAR	81 (24)	12 (30)		
FEVAR Only	87 (26)	8 (20)		
1V FEVAR	4 (2)	1 (5)		
2V FEVAR	13 (8)	4 (20)		
3V FEVAR	32 (10)	4 (20)		
4V FEVAR	116 (69)	11 (55)		
5V FEVAR	3 (2)	0 (0)		

	Elective (n = 331), %	Active Surveillance, Urgent Presentation (n = 40), %	Univariate P-value	Multivariate P-value
Comorbidities				
COPD	146 (44)	19 (48)	0.8	
Diabetes	53 (16)	8 (20)	0.7	
Liver disease	4 (1)	1 (3)	0.4	
Chronic kidney disease	79 (24)	19 (48)	0.002*	0.01*
Myocardial infarction	62 (19)	5 (13)	0.4	
Cerebrovascular disease	41 (12)	7 (18)	0.5	
Congestive heart failure	52 (16)	13 (33)	0.02*	0.03*
HTN	291 (88)	38 (95)	0.3	
Active smoker	73 (32)	11 (28)	0.6	
Prior aortic surgery	152 (66)	17 (43)	0.1	0.6

5:12 pm – 5:24 pm

31

Sirolimus Coated Balloon for Femoropopliteal and Below the Knee Disease: Xtosi Trial 24-Month Results

Edward Tieng Chek Choke, Hao Yun Yap, Tze Tec Chong - Sengkang General Hospital, Singapore, Singapore

INTRODUCTION AND OBJECTIVES: Sirolimus coated balloon (SCB) is a potential treatment option for peripheral arterial occlusive disease (PAOD). However, clinical data for this novel treatment for PAOD are lacking. We present the 24 months results of the first-in-human study of MagicTouch PTA SCB for treatment of PAOD for both femoropopliteal and below the knee arteries (BTK).

METHODS: XTOSI pilot study is a prospective, single-arm, open-label, single centre trial evaluating MagicTouch PTA SCB for symptomatic PAOD. Primary patency, defined as duplex ultrasound peak systolic velocity ratio less than 2.4 in absence of target lesion revascularisation, was assessed at 6, 12 and 24 months.

RESULTS: Fifty patients were recruited. The mean age was 67 [n=31 (62%) males]. SCB was applied to femoropopliteal in 20 patients (40%) and BTK in 30 patients (60%). Majority of treatments (94%) were performed for limb salvage indications (Rutherford scores 5 or 6). This was a high-risk cohort, in which 90% had diabetes, 36% had coronary artery disease, 20% had end stage renal failure, and ASA score was 3 or more in 80%. Mean lesion length treated was 227±81 mm, of which 36% were total occlusions. Primary patencies for femoropopliteal at 6, 12 and 24 months were 88%, 79% and 53% respectively. Primary patencies for BTK at 6, 12 and 24 months were 74%, 59% and 50% respectively. At 24 months, the overall freedom from target lesion revascularisation was 89%; amputation free survival was 76%; all-cause mortality was 18%, limb salvage success was 92%, and wound healing rate in remaining survivors with intact limbs was 100%.

CONCLUSIONS: MagicTouch PTA SCB in the XTOSI study showed promising clinical results to 24 months and no early safety concerns were raised. Randomized trials are needed to investigate the safety and efficacy of SCB for treatment of PAOD.

5:24 pm – 5:36 pm

32

Outcomes of Transcarotid Artery Revascularization Stratified by Institutional Designation: Academic vs. Community Hospitals

Samuel D. Leonard[1], Regina D. Husman[1], Tommaso Cambiaghi[1], Kourosh Keyhani[1], Arash Keyhani[1], Raghu Motaganahalli[2], Andres Fajardo[2], Shihuan K. Wang[1] - [1]UT Houston Medical School, Houston, TX; [2]Indiana University School of Medicine, Indianapolis, IN

INTRODUCTION AND OBJECTIVES: There is limited data for location-based comparison of specific vascular procedures such as transcarotid artery revascularization (TCAR). This investigation was performed to evaluate differences between TCAR in an academic setting versus non-teaching community institutions.

METHODS: A retrospective review of prospectively maintained system-wide TCAR databases from two institutions was performed between 2015-2022. Patients were stratified based on the setting of surgical intervention i.e. academic with trainees or non-teaching community hospital with only staff surgeons. Relevant demographics, medical conditions, anatomical characteristics, intra- and post-operative courses, and adverse events were captured for statistical analysis.

RESULTS: We identified 729 patients who underwent TCAR, 477 (65.4%) performed at academic hospitals and 252 (34.5%) at hospitals without trainees. Academic institutions were associated with complex characteristics: high cervical stenosis (P<.001), previous dissection (P<.01), prior neck radiation (P<0.001) and restenosis approached significance (P<.07). The remaining baseline characteristics examined were similar between the cohorts. Intraoperatively (Table), academic hospitals were associated with longer operative time (67min vs. 58 min,P < 0.001), higher blood loss (55cc vs. 37cc, P<.001), longer flow reversal time (9.5min vs. 8.4min, P<.05), lower frequency of protamine reversal (77% vs. 87%, P<.001). Technical success rates and CEA conversion were not statistically different. In the perioperative period, no significant difference in reintervention rates (1.5% vs. 1.5%, P => .9) or ipsilateral stroke (2.7% vs. 2.0%, P = .51). Teaching institutions were associated with similar outcomes and complications but longer LOS (1.63 days vs. 2.14 days, P<.05).

CONCLUSIONS: Academic centers were characterized by more complex patients and less efficient intraoperative variables, likely attributable to case complexity and trainee involvement. However, perioperative outcomes and incidence of adverse events at follow up were similar between the two cohorts, suggesting TCAR can be safely performed regardless of setting with similar outcomes.

Table. Intraoperative Course

	Academic	**Private**	***P*-Value**
General Anesthesia	92.70%	100%	<0.001
Protamine	77.20%	86.50%	<.01
Estimated Blood Loss	54.57 ± 48.38 mls	27.32 ± 31.09 mls	<.001
Operative Time	67.4 ± 24.9 mins	58.5 ± 19.29 mins	<.001
Flow Reversal Time	9.54 ± 7.02 mins	8.39 ± 7.18 mins	<.05
Radiation	233.4 ± 319.7 mGys	13 ± 164.1 mGys	0.69
Fluoroscopic Time	4.61 ± 3.4 mins	4.41 ± 3.7 mins	0.51
Contrast Volume	23.7 ± 10.0 mls	20.6 ± 11.6	<.001
Technical Success	98.50%	99.20%	0.43
Conversion to CEA	1.30%	0.80%	0.57
Filter Debris	48.40%	43.20%	0.19

Full Program & Abstracts

33
Moved to Case Report Session (Now CR7)

5:36 pm – 5:48 pm

34

Vascular Surgery in Low- and Middle-Income Countries: A State-of-the-Art Review

Nissma Bencheikh, Sina Zarrintan, Omar Al-Nouri, Mahmoud Malas, Ann C. Gaffey - University of California San Diego, La Jolla, CA

INTRODUCTION AND OBJECTIVES: Cardiovascular disease (CVD) represents 32% of all global deaths. Estimates project an increase in CVD mortality with the most substantial increase in low- and middle- income countries (LMICs). Within LMICs, we sought to 1) measure the burden of CVD with respect to aortic aneurysm (AA), ischemic stroke (IS), and peripheral artery disease (PAD); 2) quantify surgical access to vascular surgery services.

METHODS: The Institute for Health Metrics and Evaluation Global Burden of Disease RESULTS Tool was used to assess the global burden of CVD (AA, IS, PAD). Population data was extracted from the World Bank & Workforce data. The Cardiothoracic Surgery Network database was accessed to extract the number of vascular surgeons.

RESULTS: Cases of global CVD have nearly doubled from 271 million (95% uncertainty interval [UI]: 257 to 285 million) in 1990 to 523 million (95% UI: 497 to 550 million) in 2019. Within LMICs, the total number of Years of Life Lost (YLL) due to AA has increased to 3.32 million YLLs (95% UI: 3.11 to 3.52 million YLLs) and 172,000 deaths (95% UI: 157,000 to 183,000 deaths) in 2019. IS numbers continue to rise with observed Disability Adjusted Life Years (DALYs) of 12.6 million (95% UI 12.3 to 13.1 million) in 2019. There is nearly a 2-fold increase in incidence and death due to PAD. Globally, there are 3,966 vascular surgeons, amounting to 5.1 vascular surgeons per 10 million. LMICs have 67 vascular surgeons equating to 0.7 vascular surgeons per 10 million.

CONCLUSIONS: Extreme regional discrepancies are evident at a global scale. Identifying mechanisms to expand the vascular surgical workforce to meet the increasing need for vascular surgical access is imminent.

Figure 1. DALYs in World Bank Low and Middle Income Countries

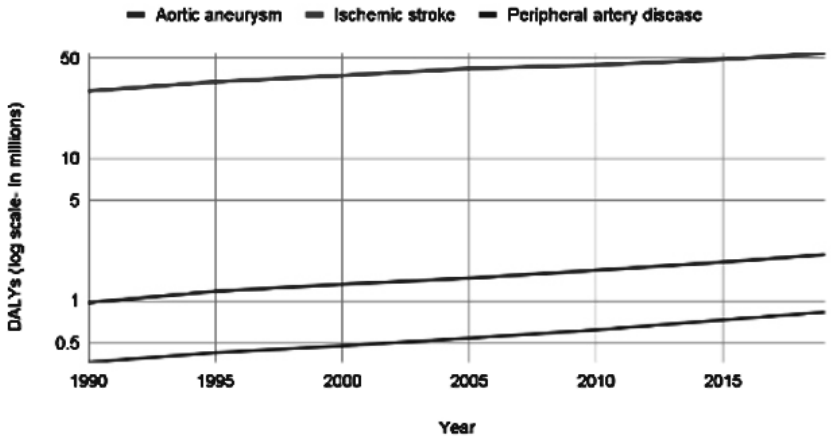
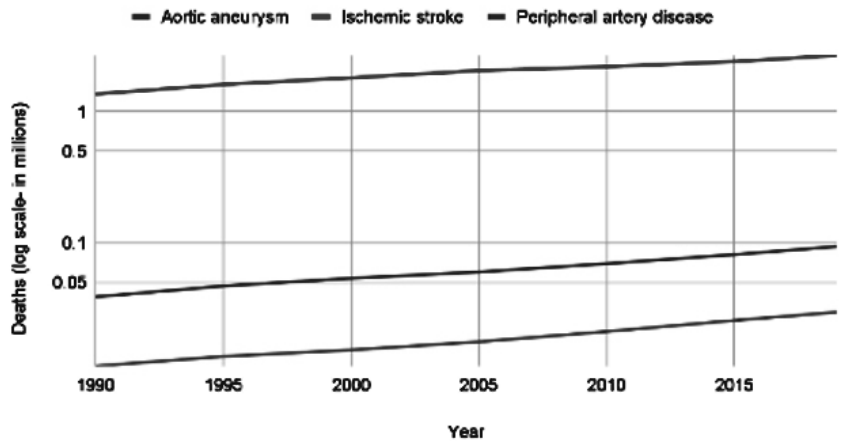


Figure 2. Deaths in World Bank Low and Middle Income Countries



6:00 pm **VESS MEMBER BUSINESS MEETING**

Full Program & Abstracts

6:00 pm – 7:00pm **CASE REPORT SESSION (Reception)**
Moderators: Greg Magee, MD & M. Libby Weaver, MD

6:00 pm – 6:10 pm CR1
A Rare of Case Klippel-Trenaunay Syndrome and Inferior Vena Cava Aneurysm: When is Surgical Management Appropriate?
Jeffrey D. Crawford[1], Reid Mahoney[2], Wyatt Rodan[3], Matthew Studer[1], Judah Gold-Markel[1], Atish Chopra[4] - [1]Legacy Health, Portland, OR; [2]Oregon Health and Sciences University, Portland, OR; [3]Oregon Health and Sciences University, Portland, OR; [4]Fort Worth, Fort Worth, TX

INTRODUCTION AND OBJECTIVES: Venous aneurysms are a rare vascular anomaly identified in both the superficial and deep systems and are often associated with congenital abnormalities such as Klippel-Trenaunay Syndrome, blue nevus syndrome and neurofibromatosis. Aneurysms of the inferior vena cava (IVC) are even more rare and pose unique clinical and surgical challenges.

METHODS: We describe the case of a 35-year-old male with Sturge-Weber Syndrome with associated left hemihypertrophy, facial port-wine stain and presumed Klippel-Trenaunay Syndrome (KTS) who presented with nephrolithiasis and an incidentally identified 7.5cm venous aneurysm of IVC and left common iliac vein confluence. The IVC aneurysm was diagnosed by computed tomography (CT). A review of prior imaging revealed the IVC aneurysm was present five years prior and at that time measured 5cm in greatest diameter.

RESULTS: Surgical management was pursued six weeks following resolution of nephrolithiasis via transabdominal exploration and venorraphy of the distal IVC and left common iliac vein. The patient's post-operative course was without complication and follow-up CT demonstrated a widely patent IVC and bilateral common iliac veins without aneurysm, stenosis or DVT.

CONCLUSIONS: There is a paucity of literature describing IVC aneurysms. This case highlights several key concepts of IVC aneurysms: 1) IVC aneurysms should be at a minimum followed with serial imaging as aneurysm growth will occur, 2) IVC aneurysms are typically associated with other congenital abnormalities such as KTS and screening should be considered in such patients, 3) open surgical management of IVC aneurysms is safe but 4) given the unknown rupture or thrombosis risk associated with venous aneurysms no threshold guidelines for repair have been established.

Figure.

6:10 pm – 6:20 pm CR2

Heparin-Induced Thrombocytopenia Associated with a Heparin-Bonded Stent: A Novel Stent-Preserving Strategy

C. Y. Maximilian Png, John Schell, Alyssa M. Flores, Rebecca K. Leaf, Walter Dzik, Abhisekh Mohapatra - Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Heparin Induced Thrombocytopenia (HIT) resulting from exposure to heparin products is well known, but there is scarce literature regarding HIT resulting from heparin-bonded stent grafts, and limited data supporting the possibility of graft preservation in these patients.

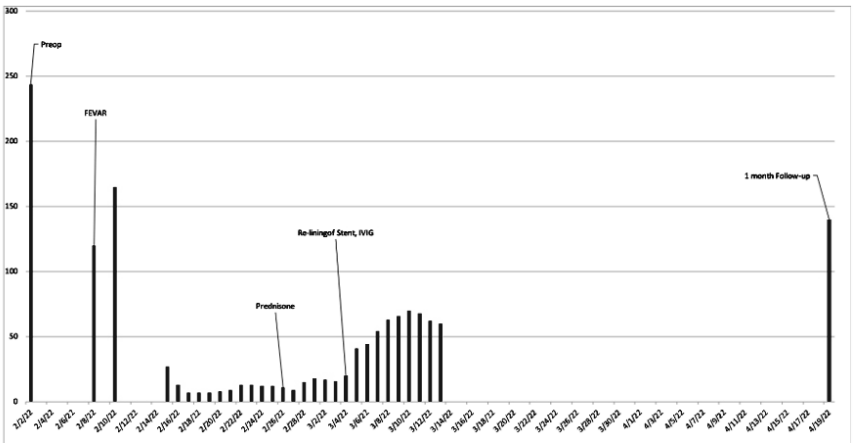
METHODS: We report a case of Type II HIT in the setting of a recent fenestrated endovascular aneurysm repair (FEVAR) which involved a heparin-bonded stent graft deployed in the left renal artery.

RESULTS: A 65-year-old male who had undergone a FEVAR with a right renal artery Atrium iCAST stent and a left renal artery Gore Viabahn VBX stent eight days prior presented to the emergency room with acute abdominal pain and hematochezia. He was noted to be severely thrombocytopenic with a purpuric rash affecting all four extremities. Despite withholding all heparin analogues and immunosuppressive treatment, the patient's thrombocytopenia and rash persisted. The determination was made to re-line the patient's left renal artery VBX stent with a non-heparin bonded iCAST stent. The procedure, performed via a brachial cutdown, was uncomplicated. The patient experienced improvement in both his thrombocytopenia and skin necrosis within a few days post-operatively, and resolution of both conditions was noted at his follow-up visit three months post-operatively (Figure).

CONCLUSIONS: Heparin-bonded stent grafts can be associated with persistent Type II HIT. We demonstrate a successful case of treatment by re-lining the stent graft without explantation in a high-risk setting. Additional cases should be compiled to support the general efficacy of this treatment modality.

Full Program & Abstracts

Figure. Trend in Platelet Count



Full Program & Abstracts

6:20 pm – 6:30 pm

CR3

Adjunctive Hemostatic and Resuscitative Techniques to Facilitate Hemipelvectomy for Parkes-Weber Syndrome

Claire E. Cassianni[1], Peter S. Rose[2], Nolan C. Cirillo-Penn[2], Stephanie F. Heller[2], Waleed Gibreel[2], Jill J. Colglazier[2] - [1]Mayo Clinic Alix School of Medicine, Rochester, MN; [2]Mayo Clinic, Rochester, MN

INTRODUCTION AND OBJECTIVES: A 37-year-old male presented with Parkes-Weber syndrome (PWS) affecting his right lower extremity, complicated by infections, high-output heart-failure (HF), and end-stage renal disease from cardiorenal syndrome. He underwent embolizations, debulking, and Trametinib, without relief. CT angiogram revealed pelvic AVMs and a dilated venous system. Hemipelvectomy was proposed after multidisciplinary evaluation.

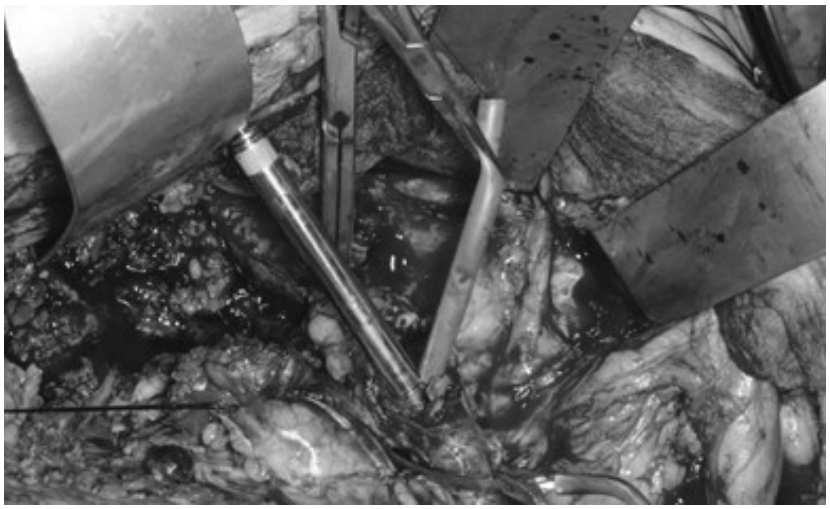
METHODS: OR set-up required multiple tables due to the size of the affected limb (Figure 1). A cardiac pause occurred during draping, emphasizing tenuous cardiac status. Continuous renal replacement (CRRT) was utilized for fluid management. Typical Esmarch exsanguination was not performed due to limited cardiac tolerance for venous return. A hemipelvectomy was performed. A locking whip-stich was utilized to obtain temporary hemostasis of the soft-tissue during exposure. The iliac vessels were isolated and ligated via a retroperitoneal approach. A purse-string suture was placed and a venotomy was made in the external iliac vein after arterial ligation. A pool-tip sucker was inserted through the venotomy after central venous clamping and total vascular isolation of the limb (Figure 2). Cell-salvage recovered 4-liters of blood for incremental small-volume transfusions to prevent volume overload. Surgery was completed without complications.

RESULTS: The patient underwent pelvic floor reconstruction using a Strattice mesh and pedicled musculocutaneous flap for closure, without heart-failure exacerbation.

CONCLUSIONS: We present a case of PWS requiring hemipelvectomy with adjuncts for hemostasis and cardioprotection. In addition to temporary soft-tissue hemorrhage control with locking whip-stiches and CRRT, insolated leg exsanguination with intravascular cell-salvage and incremental transfusion was performed to prevent heart-failure exacerbation.

Figure 1.

Figure 2.



6:30 pm – 6:40 pm CR4

Staged, Hybrid Repair of Bilateral Common Femoral, Profunda, Superficial Femoral, and Popliteal Artery Aneurysms

Megan J. Lenihan, Xuan-Binh D. Pham - 1Swedish Medical Center, Seattle, WA

We report a case of a 69-year-old man with asymptomatic aneurysms of the aorto-ilio-femoropopliteal arteries. CTA showed right side diameters of CFA 3 cm, SFA 2.1 cm, profunda 2.5 cm, popliteal 3.2 cm, and left side CFA 2.6 cm, SFA 2.1 cm, profunda 3.8 cm, popliteal 4.2 cm. Given risk of thrombo-embolic complications, extent of artery disease, and patient preference for limited open surgery, a staged, hybrid approach was utilized. He underwent left -sided bifurcated Dacron interposition graft from the EIA to the SFA and profunda with reimplantation of the largest profunda branch. A Viabahn stent was placed from the SFA anastomosis to P3, sized using IVUS. The right side was addressed seven weeks later with a shorter bifurcated interposition graft from the right EIA to SFA and profunda, with reimplantation of the largest profunda branch. Three branches of the profunda were embolized and a Viabahn stent placed from the profunda anastomosis to a distal target. The popliteal was stented from the SFA anastomosis to P3. Three months post-intervention the left profunda limb thrombosed, though the reimplanted profunda remained patent. He had stable residual endoleaks of the right profunda and bilateral popliteal arteries. He was asymptomatic. Genetic work up showed no pathogenic variants, except for a variant of undetermined significance in the cystathionine beta synthase gene. While optimal management is unclear in such rare pathology, we have found success in short term follow up with a hybrid repair. Patients presenting with this require extensive follow up and multidisciplinary care.

Figure 1.

Figure 2.

Full Program & Abstracts

6:40 pm – 6:50 pm

CR5

Undifferentiated Pleomorphic Sarcoma of the Venous System: An Extremely Rare Finding

Adam Beyer, Kedar S. Lavingia, Michael Amendola, Diana Otoya - Virginia Commonwealth University, Richmond, VA

INTRODUCTION AND OBJECTIVES: Intimal sarcoma is a grouping of uncommon pleomorphic sarcomas arising from the intimal layer of large named arteries most commonly. The venous system is rarely affected. Immunohistochemistry is positive for MDM2 in most cases, which is a negative regulator of p53. The majority of intimal sarcomas present as poorly differentiated vascular neoplasms. The elderly population is affected most with metastatic disease at diagnosis. The one-year mortality is around 80%. The pre -operative workup includes a CT chest abdomen and pelvis to exclude metastasis. The treatment follows guidelines of soft tissue sarcoma and includes a 1 cm margins with radiation therapy for resectable disease. Surveillance of patients is limited given high mortality.

METHODS: Neck masses in adults are most commonly neoplastic, the risk increases with increasing age. Adults who presented with a neck mass should undergo expedited workup to not delay the appropriate medical therapy. Our patient is a 65-year-old male with a one-month history of a left neck mass. A neck CT scan (Figure) demonstrated a 3.7cm homogenous mass. An FNA performed was nondiagnostic which was followed by an excisional biopsy.

RESULTS: Intraoperatively a solid firm well circumscribed lesion emanating from the left EJV was resected en bloc. Pathology showed locally aggressive angiocentric neoplasm with epithelioid to spindle morphology infiltrating through the vessel wall. Staining resulted in brisk proliferation index (Ki-67 90% nuclear staining) and weak S100, consistent with intimal Sarcoma.

CONCLUSIONS: Our patient had a jugular vein intimal sarcoma, which is an uncommon location. The mass also stained negative for MDM2, which is positive in most cases. Treatment of these venous lesions include excision when feasible as a potential palliative measure versus chemotherapy for inoperable tumors.

Figure. CT scan showing level II left neck mass noted with the red arrow.

Full Program & Abstracts

6:50 pm – 7:00 pm

CR6

Hybrid Repair of an Innominate Artery Pseudoaneurysm after Blunt Traumatic Injury in a Bovine Arch

Sabina M. Sorondo[1], Keyuree Satam[2], Michael J. Paisley[1], Venita Chandra[1] - [1]Stanford Health Care, Palo Alto, CA; [2]Yale School of Medicine, New Haven, CT

Innominate artery injury is an uncommon consequence of blunt trauma to the neck due to its protected position behind the thorax. A 38-year-old male presented as a trauma with a right-sided pseudoaneurysm emanating from the distal innominate artery after falling from a three-story building. On imaging, he was also found to have a bovine arch. He underwent hybrid repair with stent placement from the common carotid into the innominate artery, carotid-subclavian bypass, and plugging of the subclavian artery. The patient recovered with no cerebral insult, neurological deficits, or rupture. Post-traumatic innominate artery pseudoaneurysms can successfully be repaired via a hybrid surgical approach.

Figure 1. CT Axial View of Brachiocephalic Pseudoaneurysm

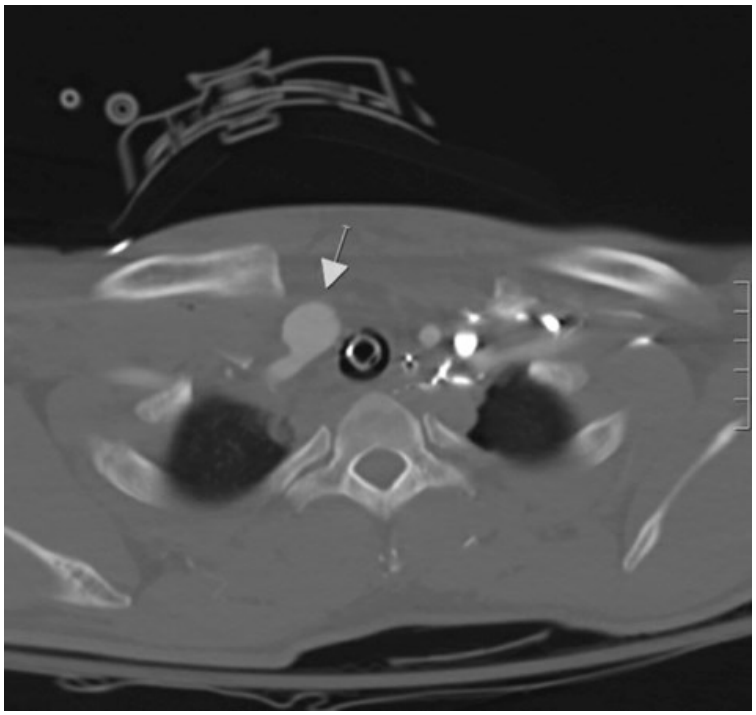


Figure 2. Illustration of Brachiocephalic Artery Stenting

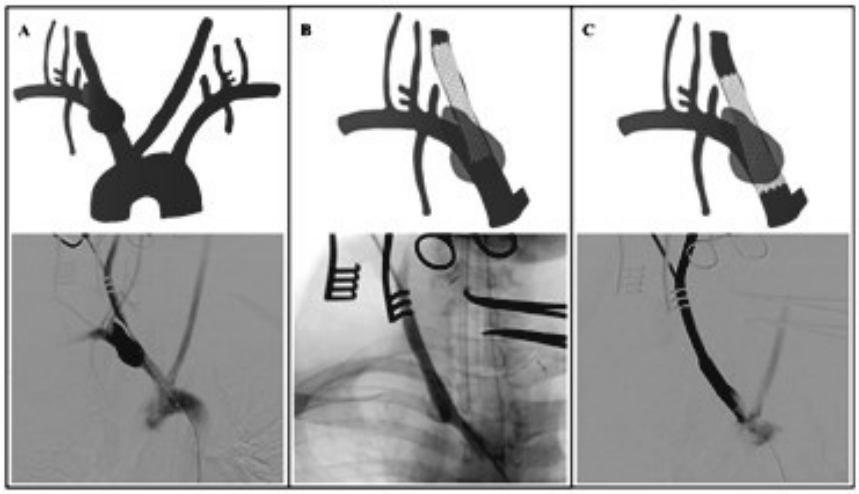
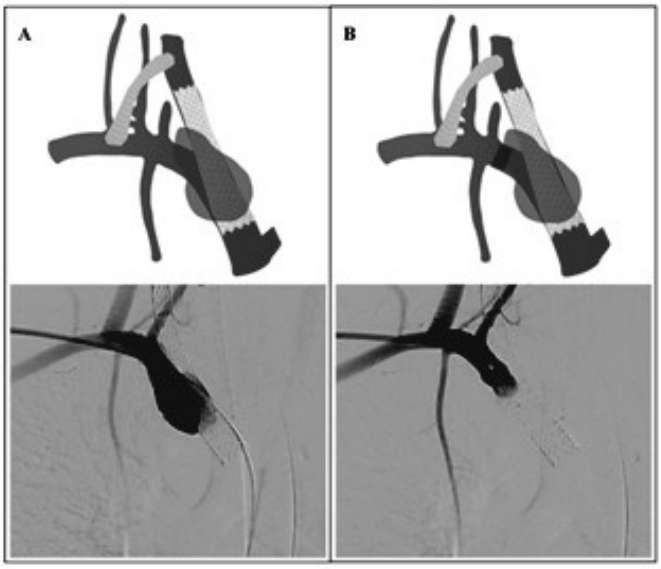


Figure 3. Illustration of Carotid-Subclavian Bypass and Subclavian Artery Plugging



Full Program & Abstracts

7:00 pm – 7:10 pm

CR7

Open Repair of a Rapidly Expanding Renal Artery Stump Aneurysm Following Radical Nephrectomy: Case Report

Christopher DeHaven, Leana Dogbe, Faisal Aziz - Penn State College of Medicine, Hershey, PA

Renal artery aneurysms are rarely seen in clinical practice, representing less than 1% of aneurysms in the general populous. Aneurysms of the renal artery stump left behind following radical nephrectomy have yet to be reported outside of a patient with a known autoimmune vasculitis. Therefore, little is known about the etiology and optimal management of this subtype of aneurysms. We report a 71-year-old male with a history of left radical nephrectomy who presented with an expanding 2.9cm x 2.6cm left renal artery stump aneurysm. Due to the anatomic complexity of the patient, he was not a candidate for endovascular repair. Therefore, open repair with ligation and excision of the left renal artery stump aneurysm and repair of a left lateral aortotomy with bovine pericardial patch angioplasty was performed. This case illustrates an option for surgical management in the setting of a very rare disease process.

Full Program & Abstracts

Saturday, February 25, 2023

6:00 am – 7:00 am	Continental Breakfast in the Exhibit Hall
6:00 am – 9:30 am	Registration
7:00 am – 9:00 am	**SCIENTIFIC SESSION IV** Moderators: Max Wohlauer, MD & Jeniann Yi, MD
7:00 am – 7:12 am	35 **Association of Baseline Chronic Kidney Disease Stage with Short and Long-Term Survival and Technical Outcomes after FEVAR** Shernaz S. Dossabhoy, Sabina M. Sorondo, Andrea T. Fisher, Vy T. Ho, Jordan R. Stern, Jason T. Lee - Stanford University, Palo Alto, CA

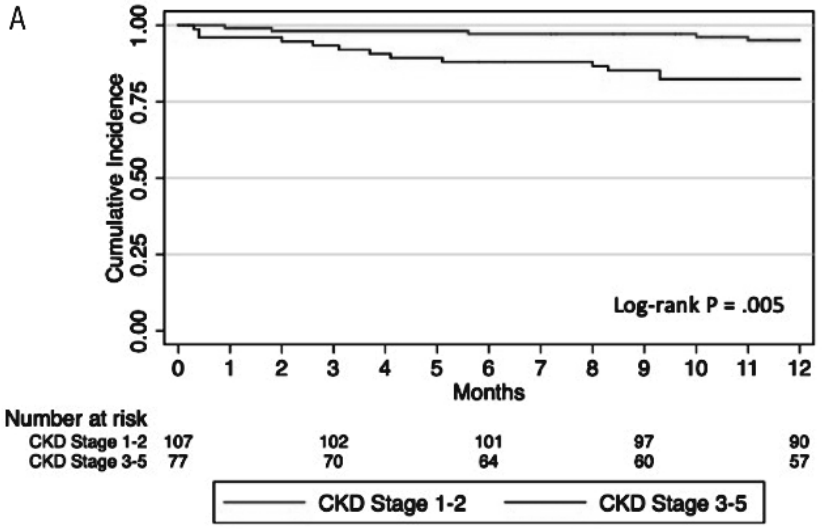
OBJECTIVES: To compare short and long-term outcomes for none-to-mild versus moderate-to-severe chronic kidney disease (CKD) patients undergoing FEVAR.

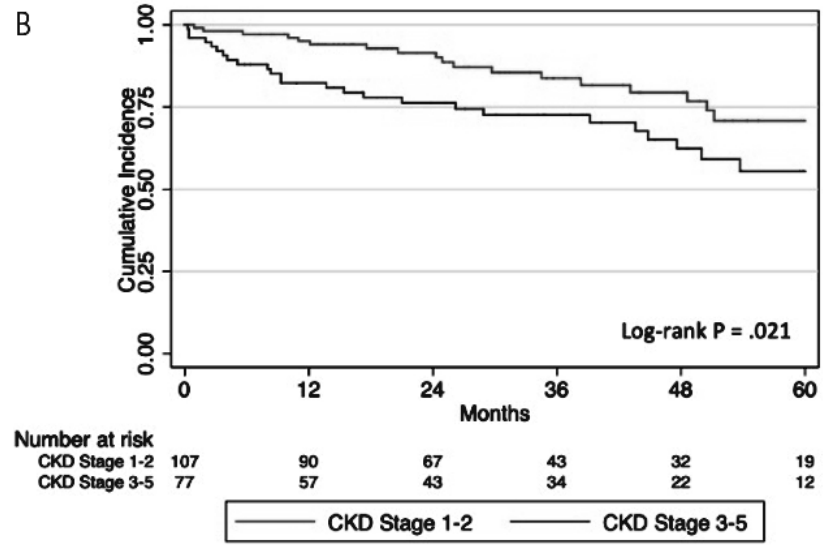
METHODS: We retrospectively reviewed patients undergoing standard FEVAR with Cook devices and >6 months follow-up completed. The cohort was stratified by pre-operative CKD stage (CKD1-2 and CKD3-5) and outcomes compared.

RESULTS: From 2012-2022 we treated 184 consecutive patients (82% male) with standard FEVAR (mean follow-up 34.3 months). Group CKD3-5 comprised 77 patients (42%), was older (75.2 vs. 73.0y, P=.04), had higher pre-operative creatinine (1.6 vs. 0.9mg/dL, P<.0001), and showed increased renal artery ostial calcification (37.7% vs. 21.5%, P=.02) compared with Group CKD1-2. Operatively, CKD3-5 patients sustained higher EBL (342 vs. 228ml, P=.01), longer operative time (186 vs. 162min, P=.04), and longer length of stay (3 vs. 2days, P<.0001) with no difference in contrast volume (93 vs. 95ml). Kaplan-Meier 1- and 5-year survival estimates were lower for CKD3-5 (82.3% vs. 95.1%, P=.005 and 55.4% vs. 70.8%, P=.021, FIGURE). Fewer CKD3-5 patients remained free from chronic dialysis at 1 year (94.4% vs. 100%, P=.015) and 5 years (84.7% vs. 100%, P=.004). There were no differences in post-operative AKI rate (CKD1-2 6.5% vs. CKD3-5 14.3%, P=.13), long-term renal artery patency, reinterventions, type I or III endoleak, mean sac regression, or total follow-up CT scans between groups. CKD stage progression occurred in 47 patients (31%) at latest follow-up but did not differ between stratified groups (P=.17).

CONCLUSIONS: Pre-operative CKD status did not negatively impact the durability or technical aneurysm outcomes after FEVAR. Worsening CKD stage was associated with lower 1- and 5-year overall survival and freedom from dialysis after FEVAR with no differences in 30-day or long-term technical aneurysm outcomes.

Figure. Freedom from all-cause mortality after FEVAR stratified by none-to-mild CKD (stage 1-2) vs. moderate-to-severe CKD (stage 3-5) at (A) 1 year and (B) 5 years.





7:12 am – 7:24 am

36

The Effects of Plavix Duration on Carotid Artery In-Stent Restenosis

Christine Jokisch, Chetan Dargan, Haroon Janjua, James Brooks, Neil Moudgill, Murray Shames - University of South Florida, Tampa, FL

INTRODUCTIONS AND OBJECTIVES: Few data are available to support the use of dual antiplatelet therapy in carotid artery stenting (CAS), and most clinical evidence is derived from studies involving coronary interventions. As a result, the appropriate duration of dual antiplatelet therapy after CAS has yet to be determined. We aimed to elucidate whether the duration of dual antiplatelet therapy played a role in the rate of carotid in-stent restenosis.

METHODS: A retrospective analysis of all patients who underwent CAS at our institution over a 20-year period (1996-2016) was performed (n=279). Patients were separated into short-term (<6 weeks, n=159) and long-term (>6 weeks, n=112) clopidogrel users. We defined clinically significant in-stent restenosis as >50% (PSV = 224 cm/s) in symptomatic patients and >80% (PSV = 325 cm/s) in asymptomatic patients based on published velocity criteria. Rates of in-stent restenosis at 1-year, 2-year, and 5-year intervals were analyzed between the two groups using chi-squared analysis.

RESULTS: Short-term clopidogrel users were more likely to have a history of atrial fibrillation (9.43% vs. 1.68%, p=0.008) and were less likely to have a history of CABG (16.35% vs. 29.41%, p=0.009), diabetes (33.34% vs. 49.58%, p=0.006) and CAD (50.31% vs. 63.03%, p=0.035). There was no significant difference between overall rates of in-stent restenosis between the short-term and long-term clopidogrel users (5.03% vs. 9.24%, p=0.168) within 5 years of the index procedure. Similar RESULTS were observed when these groups were evaluated at 1-year (5.61 % vs. 3%, p=0.321), 2-year (2.02% vs. 6.59%, p=0.072), and 5-year (2.24% vs. 3.57%, p=0.635) follow-up.

CONCLUSION: No statistically significant difference was observed in the rate of in-stent restenosis after CAS between short-term and long-term clopidogrel therapy. Patients in whom there is no other indication for longer duration clopidogrel therapy may be considered for shorter duration course of dual antiplatelet therapy following CAS.

7:24 am – 7:36 am

37

Defining Vascular Deserts to Describe Access to Care and Identify Sites for Targeted Limb Preservation Outreach

Kathryn DiLosa, Ryan Khoa Nguyen, Christina Brown, Aidan Waugh, Mimmie Kwong, Misty D. Humphries - UC Davis, Sacramento, CA

INTRODUCTION AND OBJECTIVES: Access to care is critical for limb salvage in chronic limb threatening ischemia (CLTI). A "medical desert" describes communities lacking access to adequate medical care, resulting in increased morbidity and mortality. We sought to identify and describe vascular deserts.

METHODS: California providers performing vascular procedures were identified through on-line searches, along with facility participation in Society for Vascular Surgery Vascular Quality Initiative (VQI) lower extremity bypass and peripheral vascular intervention modules. Addresses were geocoded with a 30-mile buffer using ArcGIS. Overlayed census data demonstrated population factors in desert versus non-desert areas based on type of vascular care. Healthy Places Index (HPI) overlayed data incorporated 25 social factors as a single score and percentage, with lower scores corresponding to poorer health and health outcomes.

RESULTS: Maps depicting care regions demonstrated decreased coverage with increasing specialty care. (Figure) When comparing non-deserts versus deserts for types of care, the percentage of population 200% below the poverty line, the percentage of uninsured residents, the HPI score/percentage and the percentage of white, Asian, Hispanic, and black residents was described. (Table) The percent uninsured was significant only in desert and non-desert populations served by board certified vascular surgeons (19.6 vs. 16.8%, $p < .001$). The mean HPI score and percentile was significantly lower in board certified provider and VQI facility desert regions compared to non-desert regions.

CONCLUSIONS: Through mapping of vascular deserts, patient characteristics in desert regions are better understood and areas that would benefit most from targeted outreach and limb preservation programs for CLTI are identified.

Full Program & Abstracts

Figure. Maps demonstrating types of vascular care across California with buffer zones to demonstrate desert and non-desert communities.

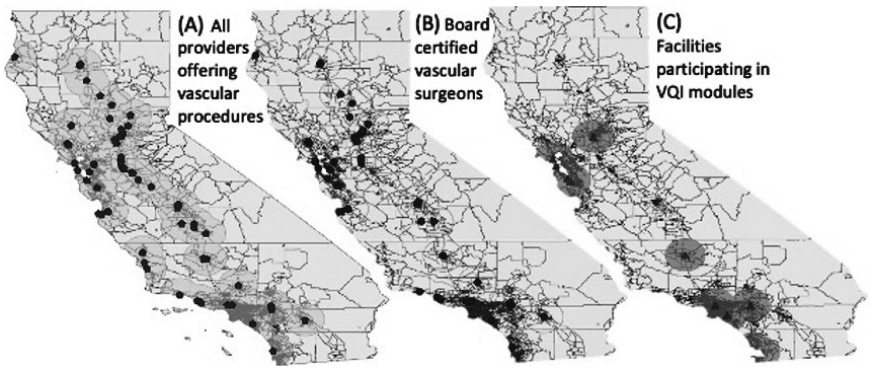


Table. Social factors and population composition of residents in desert versus non-desert communities.

	All Providers			Board-certified Vascular Surgeons			VQI Facilities		
	Non-Desert (%)	Desert (%)	P value	Non-Desert (%)	Desert (%)	P value	Non-Desert (%)	Desert (%)	P value
200% below poverty level	36.3	37.5	<.001	36.1	39.7	<.001	35.2	39.6	0.16
White	59.2	82.2	<.001	58.8	81.3	<.001	55.0	75.6	<.001
Asian	22.1	4.48	<.001	22.4	6.1	<.001	25.0	10.3	<.001
Hispanic	37.3	28.2	0.08	37.2	31.7	<.001	37.1	36.0	<.001
Black	12.2	5.5	<.001	12.4	5.4	<.001	13.4	7.4	<.001
Uninsured	17.9	17.6	0.71	19.6	16.8	<.001	17.1	17.2	0.93
HPI Score*	.0047	.0603	.006	.0089	-.1751	<.001	.0525	-.1368	<.001
HPI Percentile	50.26	53.22	.007	50.48	40.65	<.001	52.68	43.12	<.001

**The HPI score is composed of 25 individual factors organized in 8 domains: economy, education, healthcare access, housing, neighborhoods, clean environment, transportation, and social environment.*

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7:36 am – 7:48 am

38

Expected Post-Operative Duplex Ultrasound Characteristics of Distal Revascularization and Interval Ligation

Alexis Graham[1], M. Libby Weaver[2], Courtenay Holscher[1], Thomas Reifsnyder[3] - [1]Johns Hopkins Hospital, Baltimore, MD; [2]University of Virginia, Charlottesville, VA; [3]Johns Hopkins Bayview Hospital, Baltimore, MD

OBJECTIVES: There are no published standards for the expected findings on noninvasive testing following distal revascularization and interval ligation (DRIL). This study evaluated the hemodynamic results and duplex ultrasound characteristics of DRIL.

METHODS: A retrospective chart review of patients who underwent DRIL using autogenous vein between 2008-2019 was performed. Patients with both pre-operative and follow-up noninvasive testing were included.

RESULTS: 38 patients were included in the study. Median time to first follow-up (fFU) was 30 days (range 1-226d) where 12 had complete resolution of their symptoms and 26 had partial resolution. Of the 27 patients that had pre- and post-operative testing, the wrist brachial index improved from 0.56 to 0.90 with the median finger pressure improving from 56 to 73 ($p<0.001$). 17 patients had a second follow-up (sFU) at a median time from DRIL of 196d (range 106-843d). There was no significant difference in WBI or FP between fFU and sFU. Duplex ultrasound of the DRIL conduits (n=32) showed a very consistent pattern with elevated median velocities proximally (inflow 235cm/s, proximal anastomosis 217.7cm/s) and distinctly slower median velocities distally (mid-conduit 46.4cm/s, distal anastomosis 78.3cm/s, outflow 59.3cm/s). The same pattern of velocities held constant at the sFU (n=16).

CONCLUSION: There is a distinct pattern of duplex derived velocities in DRIL conduits. Proximal velocities are significantly higher than velocities more distal in the DRIL bypass without other evidence of stenosis. Elevated velocities in the brachial artery are expected due to the low resistant fistula circuit. However, the findings in the proximal DRIL were unexpected, but consistent. Elevated velocities at the proximal anastomosis do not necessarily warrant further evaluation or intervention without other evidence of conduit compromise.

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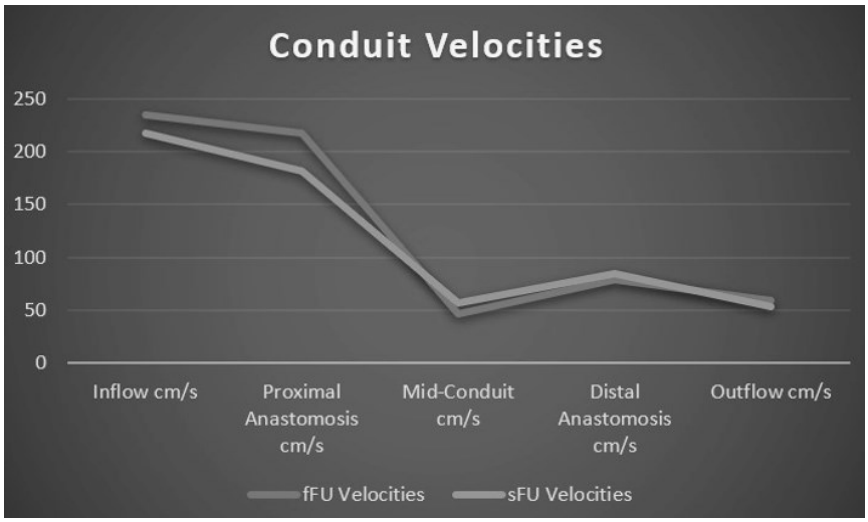
Table.



7:48 am – 7:56 am

39 (RF)

Using the Vascular Quality Initiative to Show Upper Extremity Access for Complex Aortic Aneurysm Repairs is Associated with Worse Perioperative Outcomes

Rohini J. Patel, Asma Mathlouthi, Kevin Yei, John S. Lane, Omar Al-Nouri, Mahmoud B. Malas, Andrew R. Barleben - University of California San Diego Health System, San Diego, CA

INTRODUCTION/OBJECTIVE: Physician modified endografts (PMEG) and custom manufactured devices (CMD) are deployed through a combination of upper and lower extremity access. Single institution studies have demonstrated increased risks of access site complications and stroke when upper extremity access is used compared to a total transfemoral approach. This study compares outcomes after PMEG and CMD in a national database between transfemoral only (TTF) access and mixed upper extremity (UEM) access.

METHODS: This study is an analysis of the Vascular Quality Initiate for all patients who underwent a PMEG or CMD from 2014-2021. Patients were stratified based on a TTF delivery of all devices versus any UEM access for deployment of visceral stents. Primary outcomes included stroke, perioperative death, access site hematoma, occlusion, or embolization. Secondary outcomes included operative time, fluoroscopy time, and technical success. Multivariable linear and logistic regression analysis were performed.

RESULTS: 3146 patients underwent a PMEG or CMD; 2309 (73.4%) TTF and 837 (26.6%) UEM. There was a decrease in access site hematoma 2.54% versus 4.31% ($p=0.013$), occlusion 0.61% versus 1.91% ($p=0.001$) and embolization 2.17% versus 3.58% ($p=0.026$) in the TTF versus UEM group. Logistic regression analysis indicated a two-fold increased risk of death and MI and a three-fold increased risk of stroke in the UEM group (Table). Furthermore, there is decreased operative time (221 versus 297 minutes, $p<0.001$) and fluoroscopy time (62 versus 80 minutes, $p<0.001$) in the TTF group and no difference in technical success between groups (96% versus 97%, $p=0.159$).

CONCLUSION: This study using VQI data demonstrates patients who undergo a PMEG or CMD utilizing UEM have an increased risk of perioperative MI, death and stroke compared to TTF access.

Table. Logistic Regression Between the Transfemoral Group and Upper Extremity Access Group

	Unadjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
Perioperative Death	2.06	1.45-2.93	1.94	1.21-3.08
Myocardial Infarction	1.97	1.26-3.10	1.95	1.17-3.24
Stroke	3.75	2.03-6.95	3.12	1.50-6.47

Adjusted for: age, sex, race, hypertension, coronary artery disease, history of coronary artery bypass or percutaneous coronary intervention, aortic aneurysm size at time of surgery, and history of previous aortic aneurysm repair Reference Group: Femoral only access

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7:56 am – 8:04 am

40 (RF)

Higher Carotid Bulb Distension Index Correlates with Increased Hypotension & ICU Utilization after Transcarotid Artery Revascularization (TCAR)

Kshitij Anil Desai, Justin Weissberg, Samuel Florentino, Michael Stoner, Leanne Grafmuller, Daniel Lehane - University of Rochester Medical Center, Rochester, NY

INTRODUCTION AND OBJECTIVES: Post-operative hypotension after TCAR is associated with higher ICU utilization, longer lengths of stay, and increased in-hospital mortality. Mechanisms underlying this complication have yet to be delineated. Our study aim was to identify key intraoperative factors contributing to post-operative hypotension in the setting of TCAR for asymptomatic carotid stenosis.

METHODS: We performed a retrospective analysis of TCAR procedures performed in the past three years in 72 patients with asymptomatic carotid stenosis. Factors analyzed were mean arterial pressure, heart rate, stent diameter, ICU utilization, and stent post-dilation. Carotid Bulb Distension Index was defined by the ratio of the post-dilation balloon diameter to narrowest in-stent diameter; a proxy for carotid bulb distension and carotid sinus manipulation (Figure 1). Patient metrics and intraoperative data collection was assessed using Wilcoxon rank sum, Fisher's exact, and Pearson's Chi-Square testing. The primary endpoint was the development of post-operative hypotension (sustained systolic pressure below 90mmHg).

RESULTS: Of the 72 patients analyzed, 23 (31.9%) developed post-operative hypotension conferring a 2.5-fold increase in ICU utilization ($p<0.05$). Baseline demographics between the two groups were comparable (Table 1). Post-dilation of the carotid stent was a significant factor independently associated with post-operative hypotension. Carotid Bulb Distension Index was significantly higher (0.78 vs 0.37, p-value 0.016) in patients developing post-operative hypotension (Table 2).

CONCLUSIONS: Higher Carotid Bulb Distension Index correlated with increased incidence of post-operative hypotension in the setting of TCAR for asymptomatic carotid artery stenosis and serves as novel factor contributing to carotid bulb manipulation resulting in post-operative hypotension.

Figure.

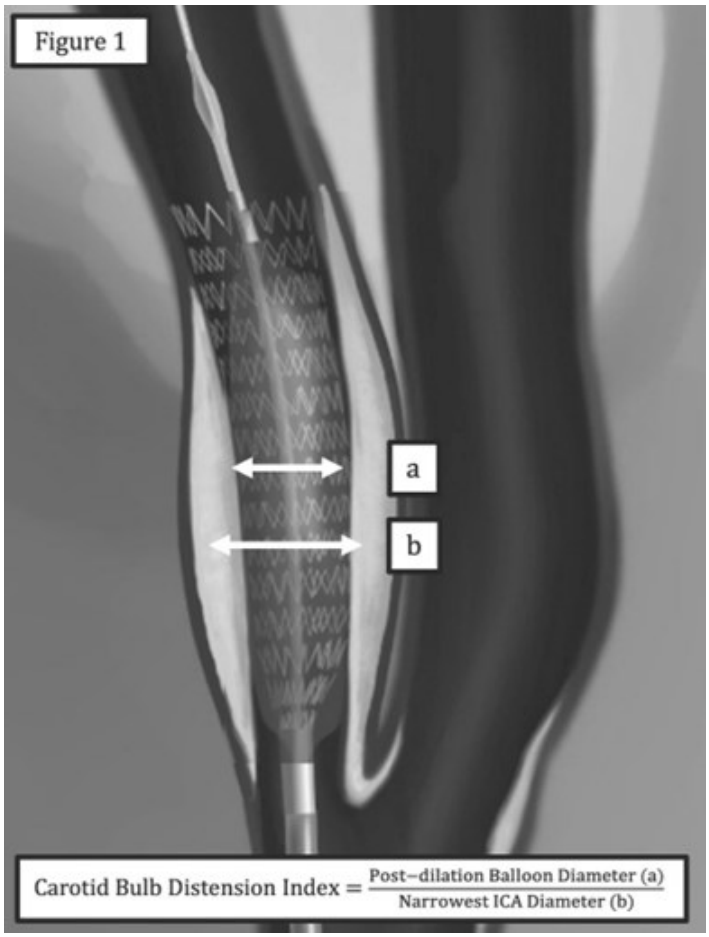


Figure 1
a
b
Carotid Bulb Distension Index = Post−dilation Balloon Diameter (a) / Narrowest ICA Diameter (b)

Full Program & Abstracts

Table 1A. Key Demographics

	Group	
Characteristic	No Post-Op Hypotension (N = 49)	Post-Op Hypotension (N = 23) (N, %)
Age (Years)	70 (10)	77 (8)
Gender (% Male)	34 (69%)	11 (48%)
Race (% White)	44 (90%)	22 (96%)
Diabetes (% DM)	16 (33%)	11 (48%)
CAD (% CAD, CHF, CABG, or PCI)	29 (59%)	15 (65%)
Smoking (% Currently Smoking)	36 (73%)	21 (91%)
Pre-Operative Hypertension (% HTN)	46 (94%)	23 (100%)

Number in group (N); Percentage (%)

Table 1B. Interoperative Variables

	Group		**p=value**
Characteristic	No Post-Op Hypotension (N = 49)	Post-Op Hypotension (N = 23)	
Max MAP (mmHg)	132 (20)	137 (29)	0.84
Min MAP (mmHg)	59 (14)	62 (10)	0.70
Average MAP (mmHg)	73 (24)	75 (31)	0.93
Max HR (bpm)	91 (17)	88 (17)	0.22
Min HR (bpm)	58 (10)	58 (13)	0.69
Stent Diameter (mm)	8.65 (1.18)	8.61 (1.23)	0.47
Narrowest In-Stent Diameter (mm)	4.08 (0.94)	4.26 (0.86)	0.17
ICU Admission Post-Operatively (N, %)	4 (8.2%)	10 (43%)	0.001
Post-Dilation (N, %)	14 (29%)	15 (65%)	0.003
Post-Dilation Index (Average)	0.37	0.78	0.016

**Wilcoxon Rank-Sum Test, Fisher's Exact Test, Pearson's Chi-Square Test*

8:04 am – 8:12 am

41 (RF)

Differences in Long-Term Outcomes in End-Stage Kidney Disease Patients with Chronic Limb-Threatening Ischemia

Stephanie Lynn Rakestraw, Zdenek Novak, Michael Y. Wang, Emily L. Spangler, Emily B. Levitan, Jayme E. Locke, Adam W. Beck, Danielle C. Sutzko - UAB, Birmingham, AL

INTRODUCTION AND OBJECTIVES: End-Stage Kidney Disease (ESKD) is a risk factor for peripheral arterial disease and major adverse limb events following infra-inguinal bypass. ESKD patients are underrepresented in vascular surgery research, despite comprising an important patient population. This study aims to compare the long-term outcomes of patients with and without ESKD undergoing endovascular peripheral vascular intervention (PVI) for chronic limb-threatening ischemia (CLTI).

METHODS: CLTI patients with and without ESKD from 2007-2020 were identified in the Vascular Quality Initiative (VQI) PVI dataset. Patients with prior and bilateral interventions were excluded. Patients undergoing femoral-popliteal and tibial interventions were included. Mortality, reintervention, amputation, and occlusion rates at two years following intervention were examined. Statistical analysis was completed with t-test, chi-square, and Kaplan-Meier curves.

RESULTS: The ESKD cohort was younger (66.6 ± 11.7 vs. 71.6 ± 12.1 years, $p<.001$) with higher rates of diabetes (82.0 vs. 60.3%, $p<.001$) the non-ESKD cohort. Long-term follow up was available for 59.1% (N=1,908 procedures) for ESKD patients and 61.1% (N=12,373 procedures) for non-ESKD patients. At 2 years, ESKD patients had a higher mortality (49.3 vs. 23.4%, $p<.001$) and higher amputation rate (22.2 vs. 7.1%, $p<.001$), however they had a lower re-intervention rate (14.2 vs. 24.9%, $p<.001$).

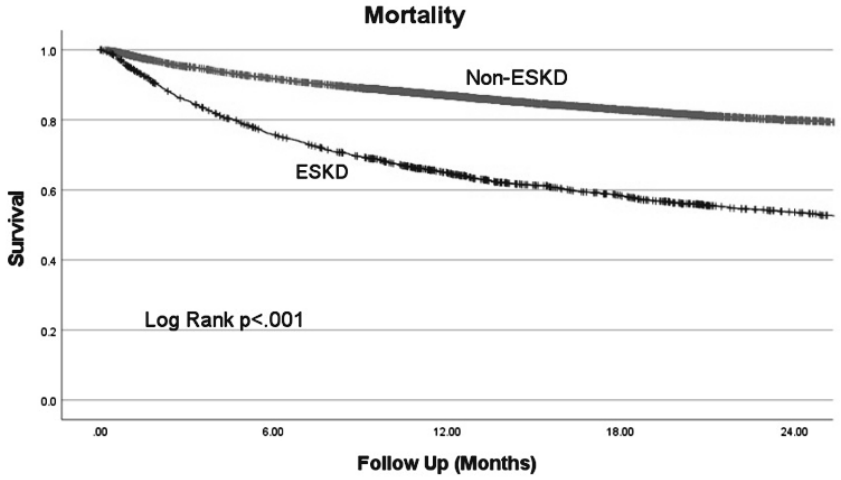
CONCLUSIONS: CLTI patients with ESKD have worse long-term outcomes at 2 years following PVI than non-ESKD patients. Mortality and amputation are higher with ESKD, while the reintervention rate is lower. Further study is needed to determine factors contributing to a lower reintervention rate in ESKD patients.

Table. Demographics in CLTI Patients with vs. without ESKD

	Non-ESKD (n = 20,252), No. %	**ESKD (n = 3,228), No. (%)**	***P* value**
Age (± SD)	71.55 ± 12.1	66.61 ± 11.68	<.001
BMI (± SD)	28.34 ± 6.88	29.23 ± 6.97	<.001
Male Sex	11,515 (56.9)	1,948 (60.3)	<.001
Race (% White)	16,447 (81.2)	1,943 (60.2)	<.001
HTN	17,693 (87.7)	3,026 (94.1)	<.001
CAD	5,713 (28.2)	1,253 (38.8)	<.001
History of Stroke	2,205 (10.9)	464 (14.4)	<.001
CHF	4,647 (22.9)	1,472 (45.6)	<.001
DM	12,205	2,646 (82)	<.001
Insulin-Dependent Diabetes	7,218 (35.6)	1,933 (59.9)	<.001
Smoking History	13,378 (66.1)	1,849 (57.3)	<.001
Current Smoking	5,768 (28.5)	442 (13.7)	<.001

ESKD, End-Stage Kidney Disease; SD, Standard Deviation; BMI, Body Mass Index; HTN, Hypertension; CAD, Coronary Artery Disease; CHF, Congestive Heart Failure; DM, Diabetes Mellitus

Figure. Kaplan-Meier Curve of Mortality Following Endovascular Peripheral Vascular Intervention in CLTI Patients with an without ESKD



Full Program & Abstracts

8:15 am – 9:00 am	**AWARD SESSION** (7-minute presentations) Moderator: Benjamin Brooke, MD & Ravi Veeraswamy, MD
	UPDATE FROM 2020 AWARD WINNER
	Travel Award: Gregory Magee, MD
	UPDATE FROM 2022 AWARD WINNERS
	Travel Award: Jonathan Bath, MD
	Medtronic Resident Research Award: Kevin Magnum, MD
	Resident Research Award: Amanda Philips, MD
	BSCI Early Career Investigator Award: Katherine Hekman, MD
	2023 AWARD WINNERS ANNOUNCEMENT
	Travel Award Medtronic Resident Research Award BSCI Early Career Faculty Award
9:00 am – 9:15 am	**INTRODUCTION OF THE PRESIDENT** Mark Conrad, MD
9:15 am – 10:00 am	**PRESIDENTIAL ADDRESS** Ravi Veeraswamy, MD
10:15 am – 11:15 am	**ROUND TABLE DISCUSSION** **"Should I Stay or Should I Go?"** Moderators: Bjoern D. Suckow, MD
3:00 pm	Registration Re-Opens
3:00 pm – 4:00 pm	Coffee/Snacks/Visit Exhibitors

Full Program & Abstracts

4:00 pm – 6:00 pm **SCIENTIFIC SESSION V**
Moderators: Michael Soult, MD & John Harlock, MD

4:00 pm – 4:12 pm 42
Dynamic Imaging is the Ideal Modality for the Diagnosis of Popliteal Artery Entrapment Syndrome
Amir Ghaffarian, Benjamin Starnes, Elina Quiroga, Nam Tran, Niten Singh - University of Washington, Seattle, WA

INTRODUCTION AND OBJECTIVES: Our objective is to describe distinct imaging features of dynamic versus static diagnostic studies for popliteal artery entrapment syndrome (PAES).

METHODS: We retrospectively reviewed patients referred for PAES. Non-invasive studies, arteriograms, and cross-sectional (CS) images were assessed. Characteristic collaterals were named and measured on for each extremity. CS images were analyzed and compared to arteriogram and intraoperative findings.

RESULTS: 23 patients were referred for PAES. All patients underwent angiography (46 extremities) and operative release was performed on 35 extremities. All limbs with PAES exhibited complete popliteal artery occlusion on angiography with provocation (Figure 1B). Distinct angiographic findings (Figure 1A) include well-developed medial sural arteries in 100% with PAES (mean diameter (D) = 2.7 mm). In limbs without PAES, 80% had a visualized medial sural artery (mean D = 2.1 mm). Lateral sural artery was visualized in 85% of treated limbs (mean D = 1.8 mm), while an anterior tibial recurrent artery was seen in 59% of treated limbs (mean D = 1.3 mm). No visible lateral sural or anterior recurrent tibial arteries were identified in limbs without PAES. 5 extremities with type 3 PAES had prior MRA with only 1 positive for arterial compression. 4 extremities had a previous CTA (Figure 2A) with three being falsely negative despite having type 3 PAES on exploration (Figure 2B).

CONCLUSIONS: Dynamic imaging provides immediate surgeon feedback by visualizing popliteal artery compression and visualizing enlarged sural collaterals. These findings are diagnostic for PAES and are not consistently seen with static imaging (CTA/MRA).

Figures.

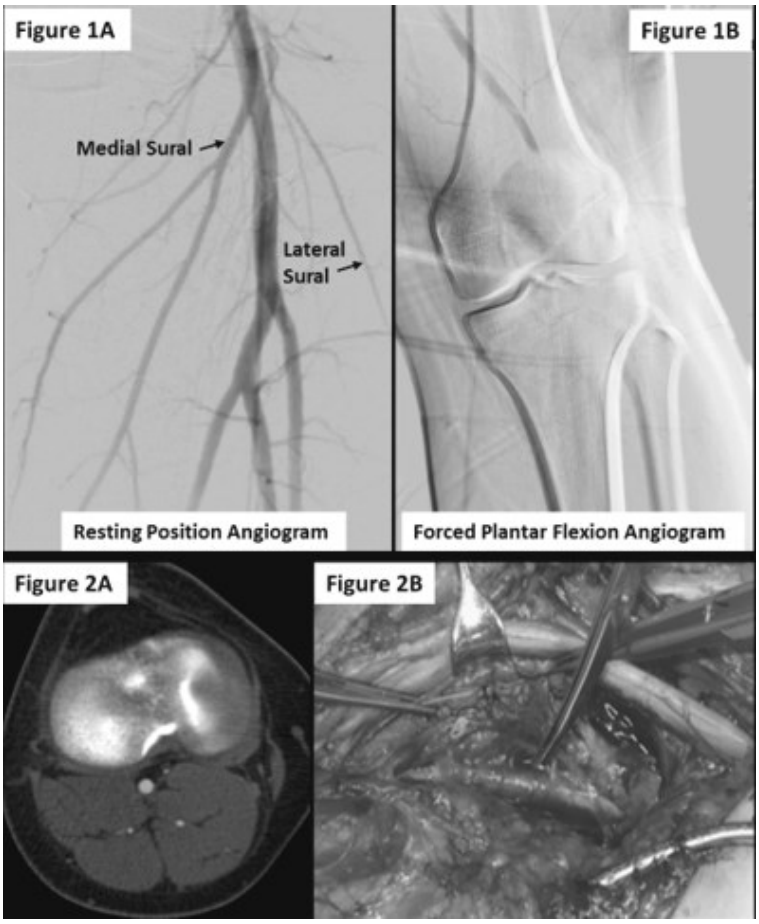


Figure 1A
Medial Sural
Lateral Sural
Resting Position Angiogram
Figure 1B
Forced Plantar Flexion Angiogram
Figure 2A
Figure 2B

4:12 pm – 4:24 pm

43

Outcomes of Aortobifemoral Bypass Based on Configuration of the Proximal Anastomosis

Sahaj Shah, Gayatri Pillai, Benjamin A. Greif, Evan J. Ryer, James R. Elmore, Gregory G. Salzler - Geisinger Medical Center, Danville, PA

INTRODUCTION AND OBJECTIVES: Aortobifemoral bypass (ABF) remains an important treatment modality in the revascularization of aortoiliac occlusive disease. Despite ABF being performed for decades, questions remain regarding the preferred arrangement of the proximal anastomosis, specifically whether an end-to-end (EE) or an end-to-side (ES) configuration is superior. The goal of this study was to compare the outcomes of ABF based on proximal configuration.

METHODS: We queried the Vascular Quality Initiative (VQI) registry for ABF procedures performed between 2009 and 2020. Univariate and multivariate logistic regression analyses were used to compare peri-operative and 1-year outcomes between EE and ES configurations.

RESULTS: Of the 6766 patients (median (interquartile range) age, 60.0 (54.2-65.8) years) who underwent ABF, 3518 (52%) had an EE proximal anastomosis and 3248 (48%) had an ES proximal anastomosis. Post-operatively, the ES cohort had a higher frequency of extubation in the operating room, lower change in renal function (8.8% vs. 11.5%; P = 0.0021), and lower use of vasopressors (15.6% vs. 19.2%; P=0.0001), but higher rates of unanticipated return to the operating room (10.2% vs. 8.7%; P=0.038) compared with the EE configuration. At 1-year follow up, the ES cohort had a significantly lower primary graft patency rate (87.1% vs. 89.9%; P<0.0001) and higher rates of graft occlusion (3.5% vs. 1.8%; P<0.0001), graft revision (4.8% vs. 3.1%; P=0.002), and claudication symptoms (12.2% vs. 9.3%; P=0.0003). The ES configuration was significantly associated with a higher rate of 1-year major limb amputations in univariate (2.5% vs. 1.8%; P=0.0061) and multivariate (OR, 1.95, CI, 1.18-3.23) analyses.

CONCLUSIONS: While the ES cohort seemed to have less physiologic insult immediately post-operatively, the EE configuration appeared to have improved 1-year outcomes. To our knowledge, this study is the largest population-based study comparing the outcomes of two anastomotic configurations. Long-term follow-up is needed to determine which configuration is optimal.

4:24 pm – 4:36 pm

44

Type IV Hypersensitivity Reaction after Cyanoacrylate Venous Closure

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INTRODUCTION AND OBJECTIVES: Non-thermal endovenous closure techniques are routinely utilized to treat superficial venous reflux with cyanoacrylate closure being a recent modality implemented for truncal closure. However, an adverse reaction of Type IV hypersensitivity (T4H) unique to cyanoacrylate is a known risk. This study aims to evaluate the real-world incidence of T4H and examine risk factors that may predispose its development.

METHODS: A retrospective review between 2012-2022 was performed at four tertiary US institutions to examine patients who underwent cyanoacrylate vein closure of their saphenous veins. Patient demographics, co-morbidities, CEAP classification, and peri-procedural outcomes were included. The primary endpoint was development of T4H post-procedure. Logistic regression analysis for risk factors predictive of T4H was performed. Variables with a $p<0.05$ were deemed significant.

RESULTS:595 patients underwent 881 cyanoacrylate venous closures. Mean age was 66.2±14.9 and 66% were female. There were 92 (10.4%) T4H events in 79 (13%) patients. Oral steroids were administered in 23% for persistent and/or severe symptoms. There were no systemic allergic reactions to cyanoacrylate. Descriptive analysis of risk factors for T4H is included in Table 1. Multivariate analysis revealed younger age, active smoking status, and CEAP 3 and 4 classifications as independent risk factors associated with development of T4H (Table 2).

CONCLUSIONS: This multicenter study shows the overall incidence of T4H to be 10% - an adverse reaction unique to cyanoacrylate. CEAP 3 and 4 patients of younger age and smokers predicted higher risk of T4H to cyanoacrylate.

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Table 1. Demographics and Descriptive Analysis of Risk Factors for Type IV Hypersensitivity

By Patient	**Type IV Hypersensitivity (N=516 patients)**	**Type IV Hypersensitivity (N=79 patients)**	**Total (N=595 patients)**	**P value**
BMI	31.0 ± 7.7	30.9 ± 6.8	31.0 ± 7.6	.836
Female Sex	339 (65.7%)	58 (73.4%)	397 (66.7%)	.175
Medication Allergies (Yes/No)	192 (37.2%)	34 (43.0%)	226 (38.0%)	.320
Number of Allergies	0.8 ± 1.7	0.7 ± 1.1	0.8 ± 1.6	.528
Autoimmune Disorder	4 (0.8%)	1 (1.3%)	5 (0.8%)	.511
History of Superficial Thrombophlebitis	20 (3.9%)	2 (3.5%)	22 (3.7%)	.755
History of Deep Venous Thrombosis	48 (9.3%)	4 (5.1%)	52 (8.7%)	.214
Hypercoaguable Disorder	8 (1.6%)	3 (3.8%)	11 (1.9%)	.167
Diabetes Type II	126 (24.4%)	20 (25.3%)	146 (24.5%)	.863
Active Smoker	41 (8.0%)	11 (13.9%)	52 (8.7%)	.080
By Procedure	**No Type IV Hypersensitivity (N=782 procedures)**	**Type IV Hypersednsitivity (N=92 procedures)**	**Total (N=881 procedures)**	
CEAP Classification				<0.001
2	215 (27.3%)	12 (13.0%)	227 (25.8%)	
3	227 (28.8%)	49 (53.3%)	276 (31.3%)	
4	163 (20.7%)	26 (28.3%)	189 (21.5%)	
5	19 (2.4%)	1 (1.1%)	20 (2.3%)	
6	165 (20.9%)	4 (4.4%)	169 (19.2%)	
Maximum Vein Diameter (mm)	6.5	6.9	6.5	.833
Vein Treated				.016
Anterior Accessory Saphenous Vein	42 (5.3%)	5 (5.4%)	47 (5.3%)	
Great Saphenous Vein	579 (73.4%)	79 (85.9%)	658 (74.7%)	
Small Saphenous Vein	168 (21.3%)	8 (8.7%)	176 (20.0%)	

Table 2. Results of Logistic Regression Models in Predicting Type IV Hypersensitivity

	Bivariate Model		Adjusted Models	
	OR [95% CI]	p-value	OR [95% CI]	p-value
Age	0.98[0.96, 0.99]	0.001	0.98[0.96, 1.00]	0.015
Female Sex	1.34[0.76, 2.35	0.309	1.31[0.66, 2.59]	0.444
BMI	1.00[0.97, 1.03]	0.873	0.99[0.95, 1.03]	0.595
Number of allergies	0.91[0.78, 1.07]	0.272	0.91[0.79, 1.05]	0.201
Autoimmune Disorder	1.43[0.15, 13.36]	0.752	2.42[0.1, 56.71]	0.584
History of superficial thrombophlebitis	0.63[0.14, 2.78]	0.539	0.61[0.11, 3.38]	0.569
History of DVT	0.45[0.16, 1.28]	0.134	0.39[0.14, 1.12]	0.081
Hypercoagulable disorder	2.38[0.68, 8.41]	0.177	3.85[0.9, 16.43]	0.069
Diabetes Mellitus II	0.96[0.55, 1.66]	0.881	1.37[0.69, 2.73]	0.367
Active smoker	2.56[1.19, 5.50]	0.016	2.39[1.07, 5.34]	0.033
Vein treated				
AASV	Ref		Ref	
GSV	1.15[0.47, 2.77]	0.762	1.40[0.59, 3.32]	0.449
SSV	0.40 [0.13, 1.28]	0.122	0.70[0.22, 2.26]	0.555
CEAP Classification				
2	Ref		Ref	
3	3.87[1.86, 8.04]	<0.001	4.16[1.95, 8.86]	<0.001
4	2.86[1.32, 6.17]	0.007	3.6[1.48, 8.74]	0.005
5	0.94[0.11, 7.92]	0.957	1.66[0.17, 15.84]	0.658
6	0.43[0.13, 1.41]	0.164	0.64[0.17, 2.37]	0.499
Maximum Vein Diameter	1.00[0.99, 1.01]	0.654	1.00[0.99, 1.00]	0.676

4:36 pm – 4:44 pm

45 (RF)
Median Arcuate Ligament Syndrome: A Video Case Report
C.J. Hillenbrand, Benjamin Starnes, Niten Singh - University of Washington, Seattle, WA

Video case report. No abstract.

4:44 pm – 4:52 pm

46 (RF)

Outcomes of Open Mesenteric Bypass for Chronic Mesenteric Ischemia among Elderly Patients

Chris Jacobs, Salvatore Scali, Brian Fazzone, Amanda Filiberto, Erik Anderson, Jonathan Krens, Martin Back, Zain Shahid, Gilbert Upchurch, Thomas Huber - University of Florida, Gainesville, FL

BACKGROUND: Chronic mesenteric ischemia (CMI) has greater prevalence among older patients; however, OMB results among elderly subjects are poorly described. Therefore, we sought to determine outcomes of OMB in elderly CMI patients compared to a younger cohort.

METHODS: All CMI OMB patients at a single center were reviewed (2002-2022). Elderly patients were defined as subjects age ≥75 pre-operatively. The primary end-point was 30-day mortality. Secondary end-points included complications, 90-day mortality, and overall survival. Kaplan-Meier methodology estimated survival. Cox proportional hazards determined mortality risk of selected covariates.

RESULTS: 146 OMB procedures were reviewed [age ≥75, 32% (n=47); age <75, 68% (n=99)]. Patients age ≥75 were more likely to be female (81% vs. age <75,58%; p=.006) and had greater cardiovascular risk-factor prevalence (Table 1). However, no significant differences in operative details were evident. Elderly patients had a 2-fold higher complication rate (any complication, 79% vs. age <75, 40%; p<.001). Similarly, 30 and 90-day mortality was greater for patients age ≥75 (30-day:15% vs. age <75,6%; p=.08; 90-day:19% vs. 6%; p=.02). Correspondingly, one-year survival was lower for elderly patients (74±6% vs. 87±5%) while comparable 5-year survival was evident (69±5% vs. 70±5; log-rank p=.07). Increasing age, female sex, greater comorbidity number, and post-operative renal failure had greatest risk of all-cause mortality (Table 2).

CONCLUSIONS: OMB outcomes for CMI in elderly patients are sobering and predominantly reflect higher comorbidity burden and physiological frailty which identifies a high-risk phenotype. As care provision for an aging population evolves, older CMI patients deemed ineligible for endovascular revascularization may become an increasingly common presentation further underscoring the importance of defining goals of care pre-operatively and implementing processes of care post-operatively to mitigate high-impact complications after OMB.

Table 1. Patient Covariates, Presentation, Operative Details and Outcomes after Open Mesenteric Bypass for Chronic Mesenteric Ischemia

Variable, % (No.)	**Age < 75 (n=99)**	**Age ≥ 75 (n=47)**	**p-value**
Age, years (±SD)	63±9	78±4	**< .001**
Male sex	42%(42)	19%(9)	**.006**
BMI	24±7	22±5	.09
Comorbidities			
Hypertension	71% (71)	98% (45)	**< .001**
Smoking (current/former)	41% (40)	43% (19)	1
Dyslipidemia	52% (51)	78% (36)	**.004**
Coronary artery disease	33% (33)	57% (26)	**.01**
Chronic obstructive lung disease	28% (28)	26% (12)	.73
Chronic kidney disease (eGFR<60)	10% (10)	11% (5)	.92
Diabetes mellitus	15% (15)	22% (10)	.36
Congestive heart failure	6% (6)	20% (9)	**.02**
Presentation			
Admission mode			
Emergency room	8% (8)	11% (5)	.61
Hospital transfer	21% (21)	32% (15)	.16
Elective	71% (70)	57% (27)	.11
Procedure Details			
EBL (mL)	609±597	417±463	.09
Packed red blood cells (units)	1.2±1.8	1.0±1.7	.32
Auto-transfusion (mL)	249±553	147±276	.16
Crystalloid (mL)	3201±1622	2681±1346	.05
Conduit			
Dacron	92% (91)	98% (46)	.16

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Variable, %(No.)	**Age < 75 (n=99)**	**Age ≥ 75 (n=47)**	**p-value**
Autogenous femoral vein	8% (8)	2% (1)	.16
Single SMA target (vs. SMA+Celiac)	30% (30)	26% (12)	.55
Retrograde bypass configuration	13% (13)	17% (8)	.53
Prior mesenteric stent	30% (29)	23% (11)	.47
Outcomes			
Length of stay, days (±SD)	14±14	22±19	**.006**
Any complication	40% (39)	79% (37)	**< .001**
Total # of complications	1±1.5	2±1.9	**< .001**
Cardiac complication	11% (11)	28% (13)	**.01**
Bleeding complication	7% (7)	19% (9)	**.03**
Renal failure/new dialysis	7% (7)	19% (9)	**.03**
In-hospital mortality	6% (6)	15% (7)	.08
30-day mortality	5% (5)	11% (5)	.22
90-day mortality	6% (6)	19% (9)	**.02**
Discharge status			
Home	73% (72)	38% (18)	**< .001**
Rehab	20% (20)	43% (20)	**.005**
Death	6% (6)	15% (7)	.08
Transfer	1.3% (1)	4% (2)	.21
Any re-intervention	4% (4)	4% (2)	.95
Follow-up time, months (±SD)	39±47	19±26	**.005**

Table 2. Independent Predictors of All-cause Mortality after Open Mesenteric Bypass for Chronic Mesenteric Ischemia

Predictor	**HR**	**95% CI**	**P-value**
Post-operative renal failure/new dialysis	9.7	4.4-21.5	**<.001**
Pulmonary complications	3.7	2-6.8	**<.001**
Hypertension	3.5	1.2-9.8	**.02**
Any complication	2.9	1.5-5.5	**.001**
Bleeding complication	2.8	1.3-6.1	**.01**
Cardiac complication	2.7	1.3-5.8	**.01**
Chronic kidney disease (eGFR<60)	2.1	.9-4.7	**.08**
Congestive heart failure	2.1	0.9-5.1	**.09**
Female sex	2.0	1.01-4.1	**.049**
GI complication post-operatively	1.9	0.9-3.7	**.07**
Age ≥ 75	1.8	0.9-3.6	0.1
Number of comorbidities	1.2	1.1-1.4	**.01**
Age (per year)	1.1	1.0-1.1	**.01**
Retrograde bypass configuration	0.8	.4-2.2	.8

4:52 pm – 5:04 pm

47

Characteristics and Outcomes of Patients Undergoing Infrainguinal Bypass in the Endovascular Era

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INTRODUCTION AND OBJECTIVES: The Society for Vascular Surgery (SVS) Objective Performance Goals (OPG) for lower extremity bypass (LEB) were based upon patients who were good risk for revascularization. In the endovascular era, most LEB patients have had prior interventions and are anatomically high-risk. The goal of this study is to characterize our patient population undergoing LEB and determine if outcomes are commensurate with the parameters established by the SVS.

METHODS: All patients who underwent LEB for CLI over a 10-year period were included. Anatomically high-risk was defined as having infrapopliteal distal target or non-ipsilateral GSV conduit. Primary, assisted, secondary patency and freedom from amputation were evaluated using Kaplan-Meier survival analysis.

RESULTS: There were 169 LEB performed for CLI. 102 (60.35%) male, 19 (11.24%) prosthetic graft, 115 (68.05%) for tissue loss, and 118 (69.82%) tibial distal target. Median age was 71yrs, mean follow-up was 2.05 yrs. 59 (34.91%) developed recurrent symptoms, 95 (56.21%) required re-intervention, and 12 (13.61%) required major amputation. Freedom from amputation at 1 & 5 yrs. was 88.41% (81.77-92.73) and 79.15% (68.46-86.56), freedom from amputation at 1 year was 76.5% (73.7-79.5) in the SVS OPG cohort. Primary patency at 1 & 5 yrs. was 84.23% (76.40-89.64) and 72.20% (55.24-83.63) respectively. Assisted primary patency at 1 & 5yrs. was 86.92% (79.81-91.66) and 74.32% (60.24-84.05) respectively. Secondary patency at 1 & 5yrs. was 87.17% (80.17-91.82) and 75.2% (61.65-84.54).

CONCLUSIONS: The majority of patients undergoing LEB in the endovascular era would be considered high risk by the SVS OPG document. Despite this, the 1-year patency and limb salvage rates in this cohort were superior to both the overall and high-risk SVS OPG LEB cohorts. This supports the continued use of LEB for limb salvage in patients who have failed endovascular approaches.

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Tables.

	1 Year	5 Years
Freedom from Amputation	88.41% (81.77 – 92.73)	79.15% (68.46 – 86.56)
Primary Patency	84.23% (76.40 – 89.64)	72.20% (55.24 – 83.63)
Assisted Patency	86.92% (79.81 – 91.66)	74.63% (60.24 – 84.05)
Secondary Patency	87.17% (80.17 – 91.82)	75.20% (61.65 – 84.54)

	1 Year Overall Risk	1 Year High Risk
SVS OPG Freedom from Amputation	76.50% (73.70 – 79.50)	74.40% (70.60 – 78.30)

**Data reported as % (95% CI)*

5:04 pm – 5:12 pm

48 (RF)

Predictors of Arteriovenous Fistula Maturation among Patients with Severe Obesity

Laura C. Anderson, Larry W. Kraiss, Mark R. Sarfati, Julie B. Hales, Benjamin S. Brooke - University of Utah, Salt Lake City, UT

OBJECTIVE: There is an increasing prevalence of obesity among patients who develop end-stage renal disease and require dialysis. While referrals for arteriovenous fistulas (AVFs) among patients with class 2-3 obesity (i.e., BMI ≥35) are increasing, it's unclear what type of autogenous access is most likely to mature in this patient population. This study was designed to evaluate factors that impact maturation of AVF among patients with class ≥2 obesity.

METHODS: We retrospectively reviewed AVFs created at a single center from 2016 to 2019 for patients who had undergone dialysis within the same healthcare system. Ultrasound studies were used to evaluate factors that defined functional maturation, including diameter, depth, and volume flow rates through the fistula. Logistic regression models were used to evaluate the risk-adjusted association between class ≥2 obesity and functional maturation.

RESULTS: A total of 202 AVFs [radiocephalic (24%), brachiocephalic (43%), and transposed brachiobasilic (33%)] were created during the study period, of which 53 (26%) patients had a BMI >35. Functional maturation was significantly lower among patients with class ≥2 obesity undergoing brachiocephalic (58% obese vs. 82% normal-overweight; P=0.017), but not radiocephalic or brachiobasilic AVFs. This was primarily a result of excessive AVF depth in severely obese patients (9.6±4.0mm obese vs. 6.0±2.7mm normal-overweight; P<0.001), whereas there was no significant difference found in average volume flow or AVF diameter between groups. In risk-adjusted models, a BMI ≥35 was associated with a significantly lower likelihood of achieving AVF functional maturation (OR:0.37; 95% CI:0.18-0.74; P=0.006) after controlling for age, sex, socioeconomic status and fistula type.

CONCLUSIONS: Patients with a BMI ≥35 are less likely to mature AVFs after creation. This principally affects brachiocephalic AVFs and occurs as a result of increased fistula depth as opposed to diameter or volume flow parameters. These data can help guide decision making when planning AVF placement in severely obese patients.

5:12 pm – 5:24 pm

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TEVAR Acutely Increases Left Ventricular Work in an Animal Model

David P. Stonko, Joseph Edwards, Hossam Abdou, Patrick Walker, Rebecca N. Treffalls, Randall R. DeMartino, Bernardo C. Mendes, Caitlin W. Hicks, Jonathan J. Morrison - Johns Hopkins, Baltimore, MD

INTRODUCTION: Thoracic aortic stent-grafts are thought to decrease aortic compliance and may contribute to hypertension and heart failure post-TEVAR. Left ventricular (LV) biomechanics post-TEVAR have not been quantified. The aim of this study is to use LV pressure-volume (PV) loops to characterize the end systolic pressure (ESP)-volume relationship (ESPVR) and end diastolic pressure (EDP)-volume relationship (EDPVR) in a large animal model.

METHODS: Anesthetized Yorkshire swine (N=6) were percutaneously instrumented with an LV PV-loop catheter and an aortic arch pigtail catheter. A 20mmx10cm TEVAR stent-graft was deployed distal to the left subclavian via the femoral artery under fluoroscopy. Cardiac biomechanics were assessed before and after TEVAR. As a sensitivity analysis, IVC occlusion with PV loop assessment was performed pre- and post-TEVAR in one animal to obtain preload independent ESPVR and EDPVR.

RESULTS: All 6 animals underwent successful instrumentation, with mean LV ESP immediately post-TEVAR (pre-TEVAR: 106 vs. post-TEVAR: 118 mmHg, $p=0.04$, Figure 1), with no change in the EDP, or end systolic pressure or volume (all $p>0.05$). In the sensitivity analysis with IVC occlusion, the ESPVR migrated upward and leftward indicating increased LV work (red to black lines, Figure 2), with a left shift in end-IVC occlusion cardiac potential energy (orange to green lines, Figure 2). There was no EDPVR augmentation ($p>0.05$, Figure 1-2).

CONCLUSION: TEVAR was associated with an acute increase in LV ESP and shift in the ESPVR indicating increased ventricular work. This provides potential mechanistic insights into the development of post-TEVAR hypertension and heart failure.

Figure 1. Pre- and Post-TEVAR End Systolic and End Diastolic LV Pressure

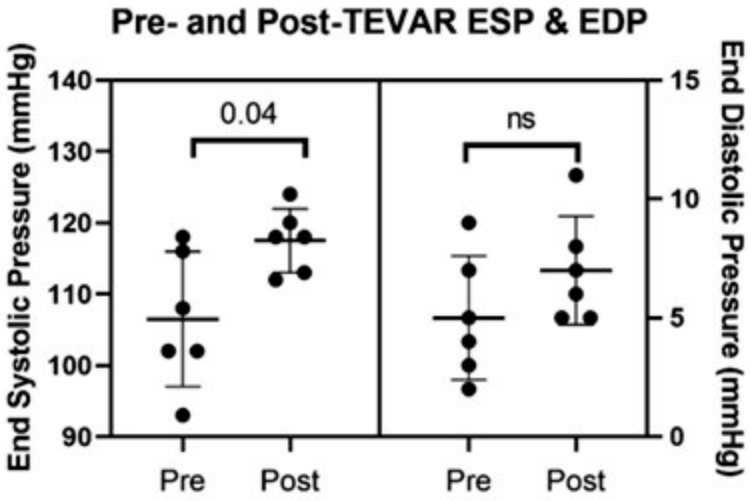
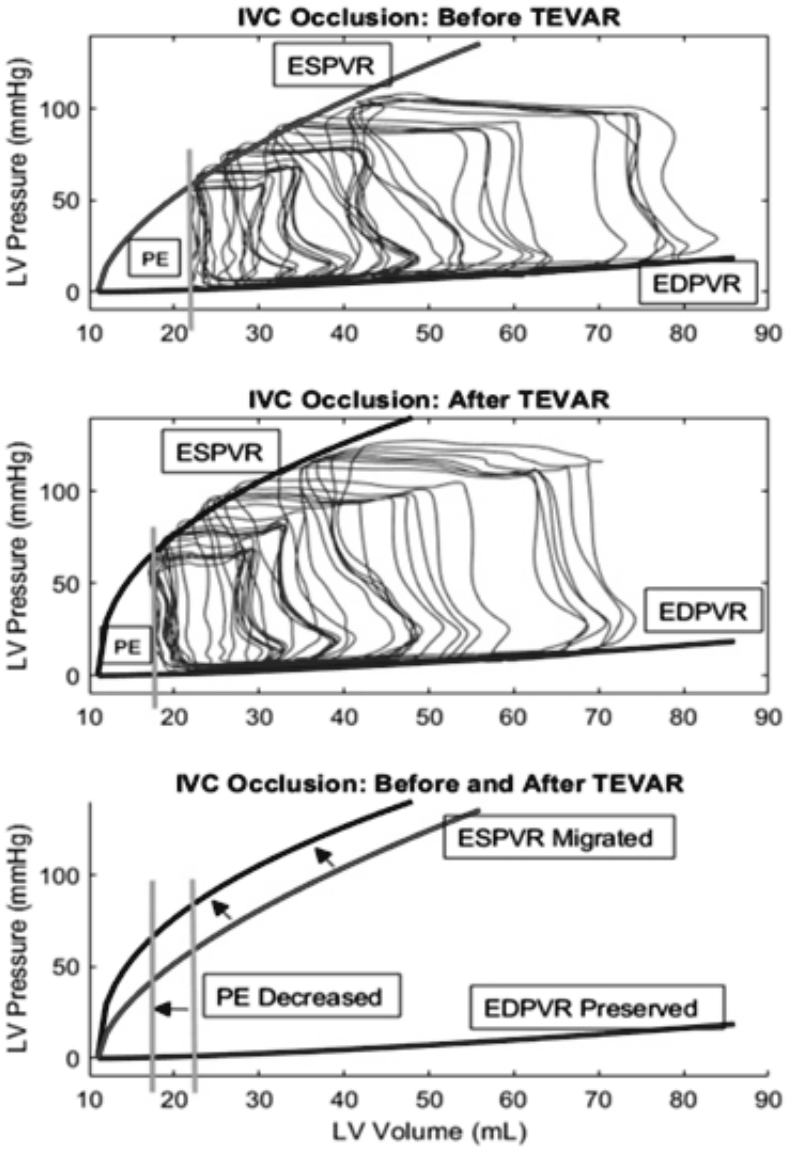


Figure 2. PV Loops during IVC Balloon Occlusion before and after TEVAR



5:24 pm – 5:36 pm

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Industry Funding Negatively Impacts Publication of Vascular Surgery Trials

Mary A. Binko, Katherine Reitz, Rabih A. Chaer, Edith Tzeng, Mohammad H. Eslami, Natalie D. Sridharan - University of Pittsburgh, Pittsburgh, PA

INTRODUCTION AND OBJECTIVES: Discontinued and unpublished randomized clinical trials are a common problem resulting in publication bias and loss of potential knowledge. Characteristics of these trials within vascular surgery remains unknown.

METHODS: Randomized clinical trials relevant to vascular surgery registered between 01/01/2010-10/31/2019 on ClinicalTrials.gov were included (Figure 1). Trials meeting enrollment sample size were considered completed. Publications were identified on ClinicalTrials.gov, PubMed, and Google Scholar >30 months after trial completion allowing time for publication.

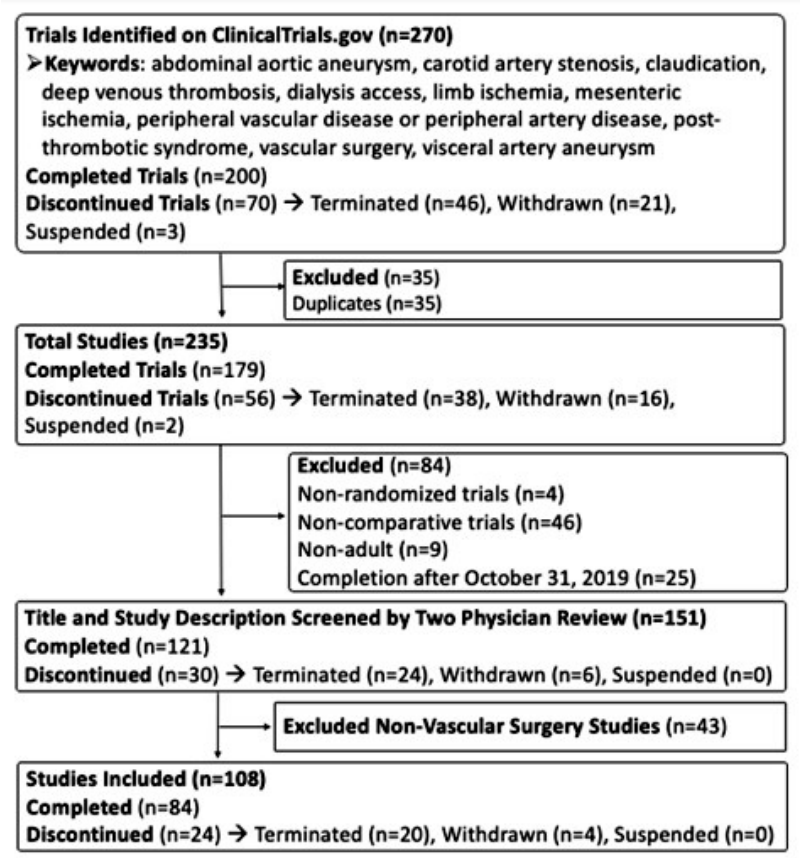
RESULTS: Of 108 trials, 22% (24/108) were not completed. 17% (4/24) were terminated prior to and 83% (20/24) after some enrollment. 26.1 ± 45.1% of enrollment was achieved for discontinued studies. Of the 83% of trials providing a reason for discontinuation, poor enrollment (46%), inadequate supplies (8%), design concerns (8%) were most common. Of the 78% of trials completed, 76% (64/84) were published in a peer-reviewed journal. Average time to publication was 2.2 ± 1.5 years. Most published trials reported positive (64%) or neutral (30%) results with a minority reporting negative (5%) results. Of the 24% (20/84) unpublished completed trials, 40% posted results on ClinicalTrials.gov. Therefore, results of the remaining 60% of unpublished trials, encompassing 2,972 enrollees, remain publicly unavailable. In multivariate regression, industry funding was significantly associated with unpublished trials (Table 1).

CONCLUSION: Nearly a quarter of registered vascular clinical trials were abandoned. Of completed trials, 1/4 remain unpublished with industry funding associated with decreased likelihood of publication. As a field synergistically functioning with industry for development and innovation, this study highlights the need to report all trial findings.

Table. Characteristics of published and unpublished studies reported as number (percentage). Univariate and multivariate analysis of published and unpublished studies reported as odds ratio and 95% confidence interval.

Characteristic	**Published** (n=64)	**Unpublished** (n=20)	**Univariate**			**Multivariate**		
			OR	**95% CI**	**P value**	**OR**	**95%CI**	**P value**
Funding								
Non-industry	47 (73.4)	7(35.0)	Reference			Reference		
Industry	17(26.6)	13(65.0)	0.19	0.07-0.57	**0.003**	0.18	0.05-0.71	**0.014**
Intervention								
Drug	47 (73.4)	13 (65.0)	Reference			Reference		
Biologic	2 (3.1)	4 (20.0)	0.14	0.02-0.84	**0.03**	0.17	0.02-1.25	0.08
Device	12 (18.8)	3 (15.0)	1.11	0.27-4.52	0.89	1.46	0.30-7.04	0.63
Other	3 (4.7)	0 (0.0)	1			1		
Number of Centers								
Single	41 (64.1)	12 (60.0)	Reference			Reference		
Multiple	19 (29.7)	8 (40.0)	0.70	0.24-1.98	0.50	2.38	0.50-11.36	0.28
Sample Size								
0-99	31 (48.4)	11 (55.0)	Reference			Reference		
>100	33 (51.6)	9 (45.0)	1.30	0.47-3.57	0.61	1.13	0.32-3.98	0.84
Location								
National	15 (23.4)	7 (35.0)	Reference			Reference		
International	49 (76.6)	13 (65.0)	1.76	0.59-5.21	0.31	1.33	0.36-4.84	0.67
Blinding								
None	15 (23.4)	6 (30.0)	Reference			Reference		
Blinded	49 (76.6)	14 (70.0)	1.40	0.46-4.28	0.56	2.50	0.66-9.52	0.18

Figure. Inclusion and exclusion criteria for clinical trials within vascular surgery identified on ClinicalTrials.gov.



5:36 pm – 5:48 pm

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Insulin Dependence is Associated with Poor Long-Term Outcomes but Equivalent Perioperative Outcomes Following AAA Repair

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INTRODUCTION AND OBJECTIVES: While diabetes is often a risk factor for vascular disease, its protective effects on abdominal aortic aneurysm (AAA) development have been well documented. Much less is known about the impact of diabetes-and in particular insulin dependence-on long-term outcomes following AAA repair. We aim to evaluate the role of diabetes on perioperative outcomes, mortality, and reintervention following both endovascular and open AAA repair.

METHODS: This retrospective national study analyzed data from the Vascular Implant Surveillance and Interventional Outcomes Network (VISION). The database includes VQI data matched to five years of Medicare claims data, providing more complete follow-up. We analyzed open and endovascular AAA repair outcomes for non-diabetics (ND), non-insulin-dependent diabetics (NIDDM), and insulin-dependent diabetics (IDDM).

RESULTS: Most perioperative outcomes did not differ based on diabetes status except 30-day readmission (16.3% vs. 9.5%, <0.001) and post-operative MI (2.0 vs. 0.8%, <0.001), respectively. There were significant differences in long-term outcomes (Table). Of note, insulin-dependent patients who underwent EVAR had a 15.1% (95% CI, 12.6%-18.2%) 1-year mortality, compared to 9.0% (95% CI, 8.6%-9.5%) for all others (Figure). In a multivariate analysis, both DM and IDDM were associated with a higher adjusted rate of death at 1, 3, and 5 years.

CONCLUSIONS: Patients with insulin-dependent diabetes have greater than 15% 1-year mortality following open or endovascular aneurysm repair. These findings raise questions about whether insulin-dependent diabetics-particularly those with smaller aneurysms-truly benefit from aneurysm repair.

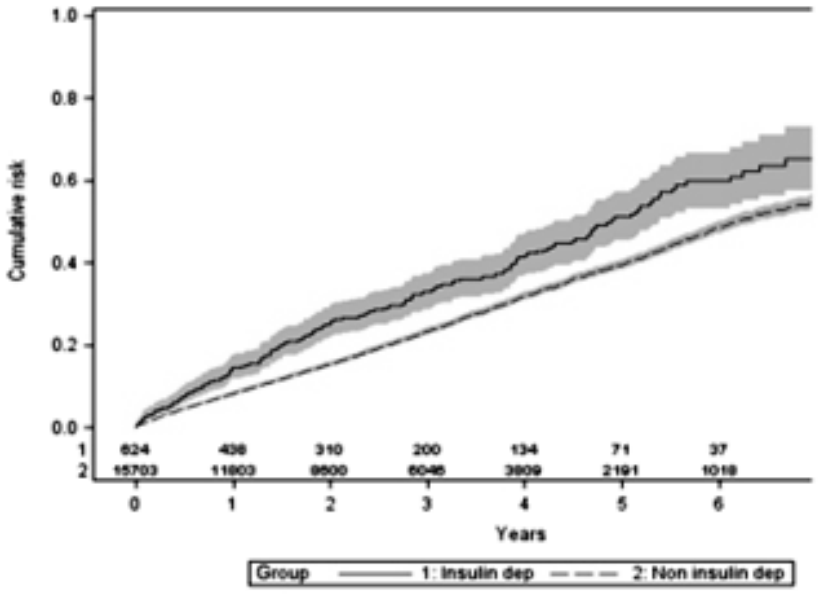
Table. Long-Term Outcomes for Diabetic and Non-Diabetic Patients

Event rates (95%CI) at 1 year, 3 years, and 5 years

		OAR		EVAR	
		Not Insulin-dependent	Insulin-dependent	Not Insulin-dependent	Insulin-dependent
Death					
	1 year	9.8%(8.7%-11.0%)	17.8%(10.7%-28.7%)	9.0%(8.6%-9.5%)	15.1%(12.6%-18.2%)
	3 years	19.2%(17.6%-21.0%)	34.6%(24.0%-48.1%)	24.4%(23.6%-25.2%)	33.7%(29.7%-38.0%)
	5 years	30.9%(28.6%-33.3%)	61.0%(43.5%-78.8%)	40.6%(39.5%-41.7%)	51.7%(46.1%-57.4%)
Reintervention					
	1 year	3.8%(3.1%-4.7%)	9.6%(4.4%-20.2%)	5.1%(4.8%-5.5%)	5.4%(3.9%-7.5%)
	3 years	7.7%(6.5%-9.0%)	14.1%(7.2%-26.7%)	11.4%(10.8%-12.0%)	10.8%(8.2%-14.2%)
	5 years	12.4%(10.7%-14.4%)	14.1%(7.2%-26.7%)	17.7%(16.7%-18.6%)	19.1%(14.2%-25.3%)
Rupture					
	1 year	0.3%(0.2%-0.7%)	0.0%(0.0%-0.0%)	0.5%(0.4%-0.6%)	0.5%(0.2%-1.5%)
	3 years	0.6%(0.3%-1.1%)	0.0%(0.0%-0.0%)	1.7%(1.4%-1.9%)	0.8%(0.3%-2.3%)
	5 years	1.2%(0.7%-2.1%)	0.0%(0.0%-0.0%)	3.2%(2.8%-3.7%)	1.9%(0.6%-6.4%)

Open aneurysm repair (OAR); Endovascular aneurysm repair (EVAR)

Figure. Long-Term Mortality for Patients Undergoing EVAR Based on Diabetes Status



Failure curve of death among elective EVAR patients. Numbers along the x-axis indicate the number of subjects at risk and the shaded area indicates 95% confidence limits.

5:48 pm – 5:56 pm

52 (RF)

Use of Direct Oral Anticoagulants Over Warfarin Improves Survival and Patency in Infra-Geniculate Bypasses with Vein Conduit Compared to Prosthetic

David P. Ebertz[1], Saideep Bose[2], Benjamin Colvard[1] - [1]University Hospitals - Case Western Reserve University, Cleveland, OH; [2]Saint Louis University, St Louis, MO

INTRODUCTION AND OBJECTIVES: There is no consensus on the optimal anticoagulant regimen following lower extremity bypass. Historically, warfarin has been utilized for prosthetic or compromised vein bypasses. With the increasing use of direct oral anticoagulants (DOAC), their efficacy is unclear and are currently utilized for both prosthetic and vein-based bypasses. The goal of this study is the evaluate whether a difference exists between vein and prosthetic infra-geniculate bypasses outcomes based on the discharge anticoagulant utilized, warfarin or DOAC.

METHODS: The Vascular Quality Initiative infra-inguinal bypass database was queried for patients who underwent infra-geniculate bypass, were anticoagulation-naïve, and discharged on anticoagulation. A survival analysis and multivariate Cox-proportional hazards analysis were performed for vein and prosthetic based bypasses for up to two years to determine whether being discharged on warfarin versus DOACs affected outcomes.

RESULTS: From 2007-2020, 2,709 patients were anticoagulation naïve, underwent vein (n=1,267) or prosthetic (n=1,442) bypass, and discharged on either warfarin (n=1,896) or DOACs (n=813). Patients with a vein bypass that were discharged on DOACs resulted in a significantly reduced overall mortality (HR 0.63, $p<0.001$), loss of primary patency (HR 0.64, $p<0.001$), risk of amputation (HR 0.52, <0.001), and risk of major adverse limb events (HR 0.63, $p<0.001$) compared to warfarin. Patients with a prosthetic bypass did not show significant difference in outcomes between DOAC and warfarin.

CONCLUSIONS: Anticoagulation-naïve patients who underwent vein based infra-geniculate bypasses had improvement in overall survival, bypass patency, amputation free survival, and freedom from MALE when discharged on a DOAC compared to warfarin. However, there was not a clear difference in outcomes with choice of anticoagulation when a prosthetic conduit was utilized.

Figure 1. Infrageniculate Vein Bypass Freedom from MALE

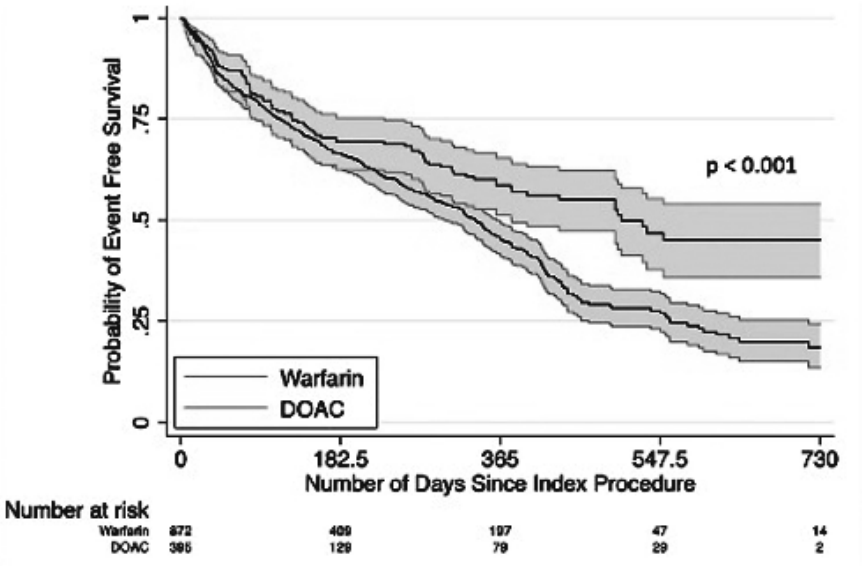
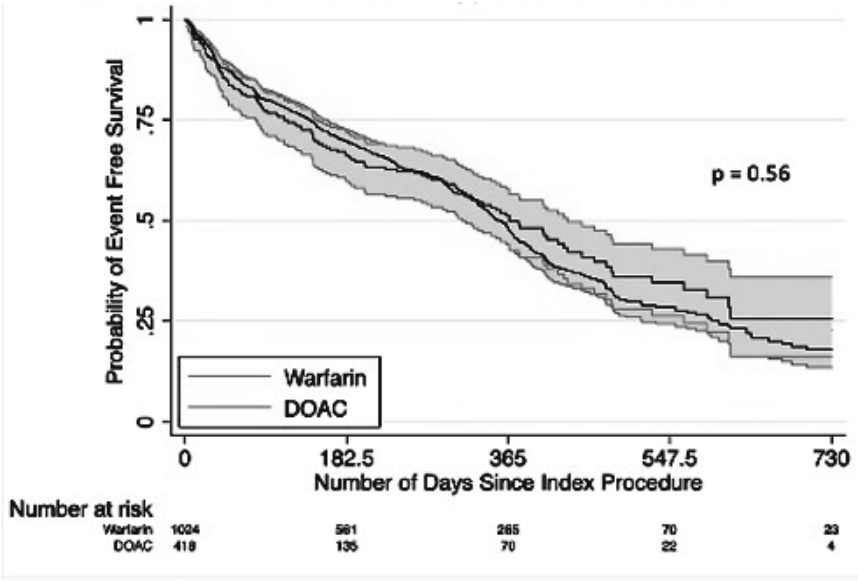


Figure 2. Infrageniculate Prosthetic Bypass Freedom from MALE



5:56 pm – 6:04 pm

53 (RF)

Outcomes of Patients Treated for Complex Abdominal Aortic Aneurysms Using Fenestrated Grafts with a Double-Wide Scallop for Celiac Artery Incorporation

Nolan C. Cirillo-Penn[1], Emanuel R. Tenorio[2], Randall R. DeMartino[1], Gustavo S. Oderich[2], Bernardo C. Mendes[1] - [1]Mayo Clinic, Rochester, MN; [2]University of Texas Health Science Center at Houston, Houston, TX

INTRODUCTION AND OBJECTIVES: Celiac artery (CA) incorporation during FB-EVAR for complex abdominal aortic aneurysms (cAAA) is typically performed with fenestrations. Double-wide scallops (DWS) can be used when appropriate. We aim to assess outcomes of patients treated with DWS for the CA during FB-EVAR for cAAA.

METHODS: Single-center retrospective review of patients enrolled in a prospective investigational device exemption trial undergoing FB-EVAR for cAAA with DWS or fenestrations for CA (design selected for optimal seal) from 2013-2020 was conducted. Endpoints were morbidity, mortality, technical success, freedom from type IA endoleak, and target vessel instability (TVI).

RESULTS: FB-EVAR with CA DWS or fenestrations was performed in 131 patients, 97 male (74%). DWS were used in 68 patients (52%) and fenestrations in 63 (48%). Mean age was 75±7.4 years in both groups. Demographics, cardiovascular risk factors, and mean aortic diameter (p=0.382) were similar except for higher smoking (p=0.037) and prior aortic repair (p=0.005) with CA fenestrations. Median number of incorporated vessels was similar (4, p=0.373). Median endovascular operative (DWS=118[98-154] min, Fenestration=141[122-170] min, p=0.006) and fluoroscopy times (DWS=64[51-78] min, Fenestration=70[61-83] min, p=0.032) were shorter with DWS, with no difference in contrast volume (p=0.204). Technical success was 96% with DWS and 100% with fenestrations (p=0.092). Three patients with DWS had partial or complete CA coverage. Median aortic coverage (above CA) was higher with fenestrations (Fenestration=5.5[4.5-6.4]cm, DWS=3.8[3.5-4.2]cm, p<0.001). There was no difference in 30-day mortality (DWS=0%, Fenestration=1.6%, p=0.297) or major adverse events (DWS=17.6% vs. Fenestration=17.5%, p=0.978). Median follow-up was 42 months [25, 50]. There were no Type IA endoleaks, aortic ruptures, or open conversions. There was no difference in sac regression (DWS=60%, Fenestration=67%, p=0.449), survival (p=0.859) or CA TVI (p=0.320).

CONCLUSIONS: FB-EVAR with DWS and fenestrations show comparable perioperative and long-term outcomes, without significant differences in technical success, TVI, and sac regression. Device design should be determined by patient anatomy and seal-zone given comparable outcomes.

7:00 pm – 10:00 pm **PRESIDENT'S DINNER**
Tickets Required

Notes

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VESS Bylaws

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.

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.

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 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 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 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.

VESS Bylaws

ARTICLE XII – ALTERATIONS, REPEAL

Bylaws may be altered or repealed at the A nnual 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 email to vess@administrare.com.

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!