VASCULAR AND ENDOVASCULAR SURGERY SOCIETY

FORMERLY PERIPHERAL VASCULAR SURGERY SOCIETY (PVSS)

46th Annual Meeting

JANUARY 27-29,2022

SNOWMASS, CO

2022 PROGRAM BOOK

www.vesurgery.org

Vascular and Endovascular Surgery Society

National Office | 100 Cummings Center, Suite 124-A | Beverly, Massachusetts 01915
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Vascular & Endovascular Surgery Society
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Past Meetings & Presidents

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
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

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

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

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 **Lowline Registration area** of the Marriott Viewline Snowmass Resort. Registration hours are as follows:

Thursday, January 27..... 7:00 am – 6:00 pm
Friday, January 28 ..... 6:00 am – 9:30 am / 3:00 pm – 6:30 pm
Saturday, January 29..... 6:00 am – 9:30 am / 3:00 – 6:00 pm

SCIENTIFIC SESSIONS

All scientific sessions will be conducted in **Salon 1** at the Marriott Viewline Snowmass Resort unless otherwise noted.

SPEAKER READY AREA

An A/V technician table will be located in the back of the general session hall (Salon 1). A technician will be available during the following hours:

Thursday, January 27..... 7:00 am – 6:00 pm
Friday, January 28 ..... 6:00 am – 9:30 am / 3:00 pm – 6:30 pm
Saturday, January 29..... 6:00 am – 9:30 am / 3:00 – 6:00 pm

TECHNOLOGY FORUM

The 2022 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, January 27, 2022

TIME: 12:45 pm - 3:45 pm

THE TECHNOLOGY FORUM IS SPONSORED BY:

Abbott Vascular, Cook Medical, Endologix, Penumbra,
Shockwave Medical, Silk Road Medical
and Terumo Aortic

Ask the Experts Program Details

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ASK THE EXPERTS SESSION 1

Practical Guide to Your First Three Years
Friday, January 27, 2022
1:00 pm – 2:00 pm
Moderator: Jeanie Ruddy, MD

Learning Objectives:

- Identify and discuss unexpected stressors encountered by vascular surgeons in their first job
- Consider how professionalism, partnership and patient care influence the early years of vascular surgery practice
- Introduce concepts to establish wellness and balance in a surgical career

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ASK THE EXPERT SESSION 2

Managing Complex Cases in Hemodialysis
Saturday, January 28, 2022
1:00 pm – 2:00 pm
Moderator: Brent Safran, MD

Learning Objectives:

- Stimulate discussion about the breadth of hemodialysis access options and how they can be utilized to meet the unique needs of our patients
- Demonstrate innovative techniques to maintain hemodialysis access for complex patients
- Achieve optimal patient-centric outcomes

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Continuing Medical Education Credit Information

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.

CREDIT DESIGNATION STATEMENT

Amedco, LLC designates this live activity for a maximum of 27.75 *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

SATISFACTORY COMPLETION

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

LEARNING OBJECTIVES

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

- Understand outcomes of use of "large diameter" aortic endografts
- Evaluate the utility of surgical deep vein arterialization in treating critical limb threatening ischemia
- Understand the effect of market competition on treatment of asymptomatic carotid disease
- Review the efficacy of a retrograde approach for treating mesenteric ischemia
- Assess the effect of concomitant and isolated venous injury in military lower extremity trauma
- Quantify the role gender plays in outcomes following complex endovascular aortic repair
- Analyze the types of adverse events associated with the Vici and Venovo venous stents
- Understand the effect of paclitaxel-coated devices on amputation and mortality rates following use in patients with peripheral vascular disease
- Review the utility of drug-coated stents in treating renal artery stenosis in transplanted kidneys

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Notes

Schedule-at-a-Glance

Thursday, January 27, 2022

7:00 am – 8:00 am	Continental Breakfast
7:00 am – 5:00 pm	Registration
7:30 am – 12:15 pm	**VASCULAR FELLOW PROGRAM** Moderator: Venita Chandra, MD
7:30 am – 12:15 pm	**GENERAL SURGERY RESIDENT PROGRAM** Moderator: Gabriela Velazquez, MD
7:30 am – 2:00 pm	**STUDENT MENTOR PROGRAM** Moderator: Nathan Orr, MD
12:15 pm – 12:45 pm	Lunch Break
12:45 pm – 3:45 pm	**TECHNOLOGY FORUM – DIDACTIC & HANDS-ON** Moderator: Mounir Haurani, MD
4:00 pm – 6:00 pm	**SCIENTIFIC SESSION I** Moderators: Jason Lee, MD & Karan Garg, MD
4:00 pm – 4:12 pm	1 **Psoas Muscle Area as a Prognostic Factor for Survival in Patients Undergoing EVAR Conversion** Chris Jacobs, Salvatore Scali, Amanda Filiberto, Kyle Staton, Scott Robinson, Michol Cooper, Martin Back, Gilbert Upchurch, Thomas Huber - University of Florida, Gainesville, FL
4:12 pm – 4:24 pm	2 **Drug-Eluting Stents are Associated with Good Mid-Term Outcomes for the Treatment of Failing Infrainguinal Bypass Grafts** David Stonko[1], Rebecca Sorber[1], Sarah E. Deery[2], Yasaman Kavousi[1], James H. Black, III[1], Ying Wei Lum[1], Bruce A. Perler[1], Christopher J. Abularrage[1], Caitlin W. Hicks[1] - [1]Johns Hopkins, Baltimore, MD; [2]Maine Medical Center, Portland, ME

Schedule-at-a-Glance

4:24 pm – 4:36 pm	3 **Comparison of Transcarotid Artery Revascularization and Transfemoral Carotid Artery Stenting Outcomes among Symptomatic and Asymptomatic Patients Based on Lesion Calcification** Jerry Zhu[1], Ajit Rao[2], Windsor Ting[2], Daniel Han[2], Rami Tadros[2], David Finlay[2], John Phair[2], Ageliki Vouyouka[2], Michael Marin[2], Peter Faries[1] - [1]Icahn School of Medicine at Mount Sinai, New York, NY; [2]The Mount Sinai Hospital, New York, NY
4:36 pm – 4:48 pm	4 **Renal Artery Stenosis Due to Entrapment** Dongjin Suh, Victor Hatcher, John Muhonen, Mel J. Sharafuddin - University of Iowa, Iowa City, IA
4:48 pm – 4:56 pm	5 (RF) **Statin Use Reduces Mortality in Patients Who Develop Major Complications after Transcarotid Artery Revascularization** Heepeel Chang[1], Muhammad Zeeshan[1], Caron B. Rockman[2], Frank J. Veith[2], Igor Laskowski[1], Vikram S. Kashyap[3], Glenn R. Jacobowitz[2], Karan Garg[2], Mikel Sadek[2], Thomas S. Maldonado[2] - [1]Westchester Medical Center, New York Medical College, Valhalla, NY; [2]New York University Langone Medical Center, New York, NY; [3]University Hospitals Cleveland Medical Center, Cleveland, OH
4:56 pm – 5:04 pm	6 (RF) **The Effect of Socioeconomic Status on Amputation Outcomes and Limb Salvage Interventions** Tyler Buckley[1], Ahsan Zil-E-Ali[2], Ryan King[1], Ravi Veeraswamy[1], Faisal Aziz[2], Elizabeth Genovese[1] - [1]Medical University of South Carolina, Charleston, SC; [2]Penn State Health, Hershey, PA
5:04 pm – 5:12 pm	7 (RF) **Association of Gun Violence with Vascular Injury and Worse Mortality Outcomes in the Pediatric Population** Momodou L. Jammeh, Annie Hess, J. Wesley Ohman - Washington University in St. Louis School of Medicine, St Louis, MO

Schedule-at-a-Glance

5:12 pm – 5:24 pm	8 **The Importance of a Multi-Disciplinary Approach for Improving Abdominal Aortic Aneurysm Screening in a Non-HMO Healthcare System** Matthew W. Mell, Janet P. Wells, Angela Aguirre - University of California Davis, Sacramento, CA
5:24 pm – 5:36 pm	9 **Endovascular (TEVAR) Versus Open Surgical Repair for the Management of Unruptured Thoracic Aortic Aneurysms in Patients with Marfan's Syndrome** Steven H. Liu[1], Brandon Muncan[1], Emily Wang[1], Nicholas J. Moehringer[1], Ayush Sangari[1], Lucyna Z. Price[2] - [1]Renaissance School of Medicine at Stony Brook University, Stony Brook, NY; [2]Stony Brook University Hospital, Stony Brook, NY
5:36 pm – 5:48 pm	10 **A Comparison of Revised Frailty Score Range Association with National Lower Extremity Bypass Outcomes by Gender** James M. Dittman[1], Kedar S. Lavingia[2], Robert A. Larson[2] - [1]Virginia Commonwealth University School of Medicine, Richmond, VA; [2]VCUHealth, Richmond, VA
5:48 pm – 6:00 pm	11 **Operative Autonomy: Assessing Resident Impact on Surgical Outcomes in Below the Knee Amputations** Alexander Simmonds, Diana Otoya, Kedar S. Lavingia, Michael Amendola - Virginia Commonwealth University, Richmond, VA
6:00 pm – 6:30 pm	**INDUSTRY SESSION** Sponsored by: Boston Scientific
6:30 pm – 8:00 pm	**WELCOME RECEPTION** All attendees, guests & exhibitors are welcome.

Friday, January 28, 2022

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration

Schedule-at-a-Glance

7:00 am – 9:04 am **SCIENTIFIC SESSION II**
Moderators: Gabriela Velazquez, MD & Matthew Smeds, MD

7:00 am – 7:12 am
12
The Use of Paclitaxel-Coated Devices in the Treatment of Peripheral Arterial Disease is not Associated with Increased Mortality or Amputations
Evan Bair, Gregory G. Salzler, Beau McCarver, Shengxuan Wang, Benjamin Greif, Matthew Major, Evan J. Ryer, James R. Elmore - Geisinger Medical Center, Danville, PA

7:12 am – 7:24 am
13
Large Fenestrations Versus Scallops for the SMA During Fenestrated EVAR: Does it Matter?
Sabina M. Sorondo, Shernaz S. Dossabhoy, Kenneth Tran, Vy T. Ho, Jordan R. Stern, Jason T. Lee - Stanford Health Care, Palo Alto, CA

7:24 am – 7:36 am
14
Impact of Socioeconomic Status on Major Amputation in Patients with Peripheral Vascular Disease and Diabetes Mellitus
Rachel R. Fan[1], Andrew K. Gibson[4], Matthew R. Smeds[1], Emad Zakhary[1,2] - [1]Saint Louis University School of Medicine, St. Louis, MO; [2]St. Louis Veteran Affairs Health Care System, St. Louis, MO; [3]Clinical Epidemiology Center, Research and Development Service, St. Louis Veterans Affairs Health Care System, St. Louis, MO; [4]Veterans Research and Education Foundation of St. Louis, St. Louis, MO

7:36 am – 7:48 am
15
Differences in Aortic Intramural Hematoma Contrast Attenuation on Multi-Phase CTA Predict Long-Term Aortic Morphologic Change
Charles Decarlo, Zachary Feldman, Brandon Sumpio, Arminder Jassar, Abhisekh Mohapatra, Matthew J. Eagleton, Anahita Dua, Jahan Mohebali - Massachusetts General Hospital, Boston, MA

7:48 am – 7:56 am
16 (RF)
Analysis of Publicly Reported Adverse Events in the Vici and Venovo Venous Stent Systems
Yuchi Ma, James Dittman, Kedar S. Lavingia, Michael Amendola - Virginia Commonwealth University, Richmond, VA

Schedule-at-a-Glance

7:56 am – 8:04 am	17 (RF) **Real World Experience with the Human Acellular Vessel: A Bioengineered Implant for Arterial Repair that Expands Limb Salvage Options** Alexis L. Lauria[1]; Alexander J. Kersey[1], Brandon W. Propper[1], Paul W. White[1], W. Darrin Clouse[2], Daniel R. Calderon[3], Todd E. Rasmussen[4], Joseph M. White[1] - [1]Uniformed Services University of the Health Sciences and Walter Reed National Military Medical Center, Bethesda, MD; [2]University of Virginia, Charlottesville, VA; [3]Heart and Vascular Institute, University of Pittsburgh Medical Center, Harrisburg, PA; [4]Mayo Clinic, Rochester, MN
8:04 am – 8:12 am	18 (RF) **Novel Use of Trans-Carotid Revascularization System for Brachiocephalic Vascular Interventions** Viraj Pandit, Peter Nelson, Steven Vang, Kelly Kempe, Kimberly Zamor, William Jennings, Hyein Kim - University of Oklahoma, Tulsa, OK
8:12 am – 8:24 am	19 **Female Gender is Associated with Worse Outcomes Following Complex Fenestrated or Branched Endovascular Aortic Repair** Brendan Gontarz[1], Ilene Staff[2], Randall DeMartino[3], Akhilesh Jain[2], Rasheed Majeen[2], Elizabeth Aitcheson[2], Parth Shah[2], Edward Gifford[2] - [1]University of Connecticut, Farmington, CT; [2]Hartford Hospital, Hartford, CT; [3]Mayo Clinic, Rochester, MN
8:24 am – 8:36 am	20 **Endovascular Repair in Patients with Heritable Thoracic Aortic Disease** Julie R. Solomon, J. Westley Ohman, Alan C. Braverman - Washington University School of Medicine, St. Louis, MO
8:36 am – 8:48 am	21 **Clinical Outcomes of a Diagnostic and Management Protocol for Popliteal Artery Entrapment Syndrome at a Large Referral Center** Amir Ghaffarian, Reginald Nkansah, Elina Quiroga, Nam Tran, Benjamin Starnes, Niten Singh - University of Washington, Seattle, WA

Schedule-at-a-Glance

8:48 am – 8:56 am

22 (RF)
Analysis of Concomitant and Isolated Venous Injury in Military Lower Extremity Trauma
Anne E. O'Shea[1], Matthew Burgess[2], David S. Kauvar[1] - [1]Brooke Army Medical Center, Fort Sam Houston, TX; [2]US Army Institute of Surgical Research, Fort Sam Houston, TX

8:56 am – 9:04 am

23 (RF)
Evaluating Neutrophil-to-Lymphocyte Ratio as a Predictive Tool for Post- Operative Outcomes in Patients Undergoing Open Lower Extremity Revascularization Procedures
Lily S. F. Adler, Emann M. Rabie, Samantha M. Shave, Anoop Alla, Saum A. Rahimi, William E. Beckerman - Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

9:30 am – 11:00 pm

INTERESTING CASE REPORT SESSION 1
Moderator: Mark Conrad, MD

CR1
Paradoxical Arterial Embolization of a Missile via the Pulmonary Vein in a Pediatric Penetrating Trauma Patient
M. Libby Weaver[1], Phillip D. Jenkins[2], Faidah Badru[1], Kyle M. Staton[1], Thomas S. Huber[1], Moiz M. Mustafa[1], Samir Shah[1] - [1]University of Florida, Gainesville, FL; [2]University of Florida School of Medicine, Gainesville, FL

CR2
Distal Brachial Artery Embolization for the Treatment of Dialysis Access Steal Syndrome
Brian M. Leoce, Helen S. Wei, Kevin Z. Molnar, Steven M. Hadley, Jr., Joe T. Huang, Michael A. Curi - Rutgers New Jersey Medical School, Newark, NJ

CR3
Concurrent Nutcracker Syndrome and Superior Mesenteric Artery Syndrome Requiring Duodenojejunal Bypass and Left Renal Vein Transposition
Taylor N. Laskowski[1], Alexandre d'Audiffret[1], Sungho Lim[2] - [1]Rush University, Chicago, IL; [2]Rush University, Chicago, IL

Schedule-at-a-Glance

	CR4 **Transthoracic Embolization of a Persistent Endoleak after Aortic Debranching and Zone 0 TEVAR** Gerardo G. Guardiola, Carla K. Scott, Jesus P. Colon, Anna L. Driessen, Felipe A. Pavarino, Marilisa S. Gonzalez, Mirza S. Baig, Melissa L. Kirkwood, Carlos H. Timaran – UT Southwestern, Dallas, TX
	CR5 **False Lumen Deployment of a CTAG Frozen Elephant Trunk During Acute Aortic Dissection Repair Can Be Rescued with Subacute TEVAR and Distal Petticoat Technique** Kush J. Sharma, Eanas S. Yassa - Spectrum Health/ Michigan State University College of Human Medicine, Grand Rapids, MI
	CR6 **Management of Ruptured Common Carotid Pseudoaneurysm Following Trans-Carotid Arterial Revascularization in a Patient with Type III Aortic Arch** Joshua S. Meredith, Brian Kuhn, Andrew Ringer, Patrick Muck, Matthew Recht, Aaron Kulwicki, Mark Broering - Trihealth, Cincinnati, OH
1:00 pm – 2:00 pm	**ASK THE EXPERTS SESSION** **Practical Guide to Your First Three Years** Moderator: Jeanie Ruddy, 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 III** Moderators: Dawn Coleman, MD & Ravi Rajani, MD
4:00 pm - 4:12 pm	24 **Unrecognized Cognitive Impairment is Common in a VA Population with Peripheral Arterial Disease** Eric J.T. Smith, Warren J. Gasper, Peter Schneider, Emily Finlayson, Louise C. Walter, Ken E. Covinsky, Michael S. Conte, James C. Iannuzzi - University of California San Francisco, San Francisco, CA

Schedule-at-a-Glance

4:12 pm – 4:24 pm

25
Midterm Clinical Outcomes of Retrograde Open Mesenteric Stenting for Mesenteric Ischemia
Nolan C. Cirillo-Penn[1], Randall R. DeMartino[1], Todd E. Rasmussen[1], Fahad Shuja[1], Jill J. Colglazier[1], Manju Kalra[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

4:24 pm – 4:36 pm

26
Increased Regional Market Competition Lowers Threshold for Revascularization in Asymptomatic Carotid Artery Stenosis
Rebecca A. Sorber[1], Courtenay M. Holscher[1], Devin S. Zarkowsky[2], Christopher J. Abularrage[1], James H. Black, III[1], Caitlin W. Hicks[1] - [1]The Johns Hopkins Hospital, Baltimore, MD; [2]University of Colorado Anschutz School of Medicine, Denver, CO

4:36 pm – 4:48 pm

27
Pre-Existing Systolic Dysfunction is the Most Powerful Predictor of Failed Arteriovenous Fistula Maturation
Christian C. Faaborg-Andersen, Christopher R. Ramos, Keri Minton, Jaime Benarroch-Gampel, Victoria J. Teodorescu, Ravi R. Rajani - Emory University School of Medicine, Atlanta, GA

4:48 pm – 4:56 pm

28 (RF)
Role of Growth Factors in Smooth Muscle Cell Migration in Tissue Engineered Vascular Grafts
Lauren N. West-Livingston[1], Young Min Ju[1], Gabriela A. Velazquez[2], Anthony Atala[1], Sang Jin Lee[1] - [1]Wake Forest School of Medicine, Winston Salem, NC; [2]Atrium Health Wake Forest Baptist, Winston Salem, NC

4:56 pm – 5:04 pm

29 (RF)
Outcomes of Carotid Artery Stenting in Patients with Carotid Tandem Lesions
Nadin Elsayed[1], Munir Paul Moacdieh[1], Taiwo Dodo-Williams[1], Asma Mathlouthi[1], Raghu Motaganahalli[2], Mahmoud Malas[1] - [1]University of California San Diego, La Jolla, CA; [2]Indiana University School of Medicine, Indianapolis, IN

Schedule-at-a-Glance

5:04 pm – 5:12 pm	30 (RF) **Endovascular Repair of Delayed Endologix AFX Graft Failure is Superior to Open Repair with Explant** Michael P. Bianco, Elizabeth A. Blazick, Kimberly T. Malka, Truc M. Ta, Robert E. Hawkins, Paul H. S. Bloch, Brian W. Nolan, Nathan J. Aranson - Maine Medical Center, Portland, ME
5:12 pm – 5:24 pm	31 **Anatomic Factors Contributing to External Iliac Artery Endofibrosis in High Performance Athletes** Andrea T. Fisher, Kenneth Tran, Shernaz S. Dossabhoy, Sabina Sorondo, Arash Fereydooni, Jason T. Lee - Stanford University, Stanford, CA
5:24 pm – 5:36 pm	32 **Lower Extremity Revascularization among Patients with Premature Peripheral Artery Disease Compared to Patients at the Common Age of Presentation in the Vascular Quality Initiative** Tanner Kim, Sarah Loh, Andrew Dewan, Michael Murray, Hamid Mojibian, Arya Mani, Carlos Mena-Hurtado, Cassius Iyad Ochoa Chaar - Yale University School of Medicine, New Haven, CT
5:36 pm – 5:48 pm	33 **Association of Loss of Commercial Insurance and the Risk of Lower Extremity Amputation in Peripheral Artery Disease** Caronae M. Howell[1], Adelina Lane[2], Juan Camilo Arias[1], Craig C. Weinkauf[1], David Armstrong[3], Tze -Woei Tan[1] - [1]Banner UMC, Tucson, AZ; [2]University of Arizona School of Medicine, Tucson, AZ; [3]University of Southern California, Los Angeles, CA
5:48 pm – 6:00 pm	34 **High Dose-Rate Brachytherapy for Lower Extremity In-Stent Restenosis: A 18-Year, Single -Center Experience** Rowza T. Rumma[1], Christian D. Cerecedo-Lopez[2], Christine T. Wu[1], Phillip M. Devlin[2], Edwin C. Gravereaux[1], Piotr S. Sobieszczyk[1], Michael T. Belkin[1], Matthew T. Menard[1] - [1]Brigham and Women's Hospital, Boston, MA; [2]Dana Farber Cancer Institute, Boston, MA

Schedule-at-a-Glance

6:00 pm – 7:00 pm	**VESS MEMBER BUSINESS MEETING**
6:15 pm – 7:30 pm	**INDUSTRY SESSION** Sponsored by: Terumo Aortic

Saturday, January 29, 2022

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
7:00 am – 9:00 am	**SCIENTIFIC SESSION IV** Moderators: Roan Glocker, MD & Jaime Bennaroch -Gampel, MD
7:00 am – 7:12 am	35 **Surgical Deep Vein Arterialization: Adding to the Armamentarium of Complex Limb Salvage** Alexis L. Lauria[1], Brandon W. Propper[1], Richard F. Neville[2] - [1]Walter Reed National Military Medical Center, Bethesda, MD; [2]Inova Heart and Vascular Institute, Falls Church, VA
7:12 am – 7:24 am	36 **TEVAR with Supra-Aortic Trunk Revascularization is Associated with Increased Risk of Periprocedural Ischemic Stroke** Ruojia Debbie Li, Matthew C. Chia, Mark K. Eskandari - Northwestern University, Chicago, IL
7:24 am – 7:36 am	37 **Utilization of Thromboelastography with Platelet Mapping for Prediction of Poor Wound Healing and Infection in Postoperative Vascular Patients** Monica Majumdar[1], Davis Waller[1], Srihari Lella[1], Brandon Sumpio[1], Zach M Feldman[1], Young Kim[1], Charles S. Decarlo[1], Jessica Cardenas[2], Ryan P. Hall[3], Kathryn Nuzzolo[1], Amanda Kirshklan[1], Anahita Dua[1] - [1]Massachusetts General Hospital/ Harvard Medical School, Boston, MA; [2]University of Texas-Houston, Houston, TX; [3]Tufts Medical Center/Tufts University School of Medicine, Boston, MA

Schedule-at-a-Glance

7:36 am – 7:48 am	38 **"Large Diameter" Aortic Endografts are Associated with Aneurysm Sac Expansion** Patricia Lu[1], Young Erben[2], Randall DeMartino[3], Bernardo Mendes[3], William Stone[1], Victor Davila[1], Ina Soh[1], William Sheaffer[1], Austin Pierce[1], Andrew Meltzer[1] - [1]Mayo Clinic, Phoenix, AZ; [2]Mayo Clinic, Jacksonville, FL; [3]Mayo Clinic, Rochester, MN
7:48 am – 7:56 am	39 (RF) **Impact of "Defensive Medicine" on the Costs of Diabetes and Associated Conditions** Austin Pierce[1], William Sheaffer[1], Victor Davila[1], Ina Soh[1], Ellen Meltzer[1], Francesco Aiello[2], Andrew Meltzer[1] - [1]Mayo Clinic Arizona, Phoenix, AZ; [2]University of Massachusetts Memorial Health, Northborough, MA
7:56 am – 8:04 am	40 (RF) **Longer Healing Times, Higher Recurrence Rates, and Increased Incidence of DVT Following Cyanoacrylate Ablation for Active Venous Ulcerations** Lindsey Korepta, Matthew Ward - Loyola University Medical Center, Maywood, IL
8:04 am – 8:12 am	41 (RF) **Clinical Outcomes and Management of Patients Presenting with Intermittent Claudication and a Low Toe Brachial Index** Drew Bromenshenkel, Alyssa Field, Lori Pounds, Clay Quint - Audie L. Murphy Memorial VA Hospital, San Antonio, TX

Schedule-at-a-Glance

8:15 am – 9:00 am

AWARD SESSION
Moderators: Benjamin Brooke, MD & Jason Lee, MD

Update from 2020 Winners
- Travel Award: Gregory Magee (Postponed)
- Resident Research Award: Christopher Audu

Update from 2021 Winners
- Travel Award: Tze-Woei Tan
- Resident Research Award: Kenneth Tran
- Early Career Faculty: Tammy Nguyen

2022 Award Winners Announcement
- Travel Award
- Resident Research Award
- Early Career Faculty Award

9:00 am – 9:15 am

INTRODUCTION OF THE PRESIDENT
Ravi Veeraswamy, MD

9:15 am – 10:00 am

PRESIDENTIAL ADDRESS
Jason Lee, MD

10:30 am – 11:30 pm

INTERESTING CASE REPORT SESSION 2
Moderator: Manuel Garcia-Toca, MD

CR7 (Video)
A Case of Congenital Absence of the Inferior Vena Cava and Deep Vein Thrombosis
Matt Low - Prisma Health Upstate, Greenville, SC

CR8
Clinical Application of Surgeon-Modified Double Inner Branched Stent Graft to Treat Aortic Arch Aneurysm
William J. Yoon[1], Ian Stines[2], Cheong J. Lee[1] - [1]NorthShore University HealthSystem, Skokie, IL; [2]University of Chicago Pritzker School of Medicine, Chicago, IL

CR9 (Video)
Innominate Artery Aneurysm Repair with Arch Debranching
Ross G. McFall, Maham Rahimi, Thomas MacGillivray - Houston Methodist Hospital, Houston, TX

Schedule-at-a-Glance

	CR10 **Revascularization of Absent Right Common Iliac Artery in a Young Athlete** Michael J. Paisley, Joshua Villarreal, Hanjay Wang, Jason T. Lee - Stanford University, Palo Alto, CA
	CR11 (Video) **Endovascular Treatment of Severely Stenotic Homograft in a Congenital Truncus Arteriosus Patient** Tru Dang, Agenor Dias, John Rhodes, Ravikumar Veeraswamy - Medical University of South Carolina, Charleston, SC
1:00 pm – 2:00 pm	**ASK THE EXPERTS SESSION** **Managing Complex Cases in Hemodialysis** Moderator: Brent Safran, MD
2:00 pm – 2:30pm	**INDUSTRY SESSION** Sponsored by: Convatec
3:00 pm	Registration Re-Opens
3:00 pm – 4:00 pm	Coffee/Snacks
4:00 pm – 6:00 pm	**SCIENTIFIC SESSION V** Moderators: Misty Humphries, MD & Kelly Kempe, MD
4:00 pm – 4:12 pm	42 **Preoperative Spinal Drain Placement is Associated with Reduced Risk of Spinal Cord Ischemia in Patients Undergoing Thoracic Endovascular Aortic Repair for Aortic Dissection** Sina Zarrintan, Kevin S. Yei, Munir P. Moacdieh, Mahmoud B. Malas - University of California, San Diego, La Jolla, CA
4:12 pm – 4:24 pm	43 **Safety and Efficacy of Drug-Eluting Stents for Treatment of Transplant Renal Artery Stenosis** Heepeel Chang[1], Bruce E. Gelb[2], Zoe A. Stewart[2], Bonnie E. Lonze[2], Karan Garg[2], Caron B. Rockman[2], Glenn R. Jacobowitz[2], Nicole M. Ali[2], Neal S. Cayne[2] - [1]Westchester Medical Center, New York Medical College, Valhalla, NY; [2]New York University Langone Medical Center, New York, NY

Schedule-at-a-Glance

4:24 pm – 4:36 pm	44 **Delirium Associated Adverse Events and Resource Use after Infrainguinal Lower Extremity Bypass** Richard D. Gutierrez[1], Zachary A. Matthay[1], Eric J.T. Smith[1], Kurt Linderman[2], Warren J. Gasper[1], Jade S. Hiramoto[1], Michael S. Conte[1], James C. Iannuzzi[1] - [1]University of California, San Francisco, San Francisco, CA; [2]University of Utah, School of Medicine, Salt Lake City, UT
4:36 pm – 4:48 pm	45 **One-Year Outcomes after Implementation of a Ruptured Abdominal Aortic Aneurysm Protocol** Amanda R. Phillips[1], Jaineet S. Chhabra[2], Paige Phillips[1], Mohammad H. Eslami[1], Rabih Chaer[1], Michel S. Makaroun[1], Michael J. Singh[1], Nathan L. Liang[1] - [1]UPMC, Pittsburgh, PA; [2]Marshall University Medical School, Huntington, WV
4:48 pm – 4:56 pm	46 (RF) **Effective Neck for Endovascular Treatment of Blunt Traumatic Aortic Injury** Tommaso Cambiaghi[1], Ezra Y. Koh[2], Rana O. Afifi[1], Gustavo S. Oderich[1] - [1]McGovern Medical School @ UTHealth, Houston, TX; [2]Houston Methodist Hospital, Houston, TX
4:56 pm – 5:04 pm	47 (RF) **Impact of Preoperative Beta-Blockade on Outcomes Following the Surgical Treatment of Atherosclerotic Disease** Anna Beth West, Abigail J. Hatcher, Ravi R. Rajani, Christopher R. Ramos, Jaime Benarroch-Gampel - Emory University School of Medicine, Atlanta, GA
5:04 pm – 5:12 pm	48 (RF) **Integrated Vascular Surgery Versus General Surgery Residency Programs: A Ten-Year Comparison Using a Normalized Competitive Index** John A. Treffalls, Rebecca N. Treffalls, Qi Yan, Mark G. Davies - University of Texas Health San Antonio, San Antonio, TX

Schedule-at-a-Glance

5:12 pm – 5:24 pm	49 **Perioperative Outcomes among Major Endovascular Stent Grafts for the Treatment of Abdominal Aortic Aneurysm** Emma Goldsmith Rooney, Anna Beth West, Caroline Wasserman, Ravi R. Rajani, Christopher R. Ramos, Jaime Bennaroch-Gampel - Emory University School of Medicine, Atlanta, GA
5:24 pm – 5:36 pm	50 **Hypogastric Artery Flow Interruption is Associated with Increased Mortality after Open Aortic Repair** Jason Zhang, Heepeel Chang, Caron Rockman, Neal Cayne, Glenn Jacobowitz, Karan Garg - NYU Langone Health, New York, NY
5:36 pm – 5:48 pm	51 **The Risk of Thromboembolic Events in COVID-19 Patients During the Height of the SARS-CoV-2 Pandemic** Janice Nam[1], Melissa D'Andrea[1], Alexander O'Hara[1], Lindsey Staszewski[1], Jacob Pozin[1], Amy Wozniak[1], Lindsey Korepta[2], Bernadette Aulivola[2] - [1]Loyola University Chicago Stritch School of Medicine, Maywood, IL; [2]Loyola University Medical Center, Maywood, IL
5:48 pm – 5:56 pm	51 (RF) **A Single Center Experience with Forearm Arteriovenous Loop Grafts for Hemodialysis** Ian M. Brastauskas, Nimesh Patel, Zachary German, Jeanette Stafford, Matthew Edwards, Mariana Muera, Gabriela Velazquez, Matthew P. Goldman, Ross P. Davis - Wake Forest Baptist Health, Winston-Salem, NC
5:56 pm – 6:04 pm	53 (RF) **Revision of Aneurysmal Arteriovenous Access with Immediate Use Graft is Safe and Avoids Prolonged use of Tunneled Hemodialysis Catheters** Isaac N. Naazie, Claire Janssen, Sean Perez, Asma Mathlouthi, Luis Cajas-Monson, Mahmoud Malas, Omar Al-Nouri - University of California San Diego, La Jolla, CA
7:00 pm – 10:00 pm	**PRESIDENT'S DINNER** Tickets Required

Notes

Full Program & Abstracts

Thursday, January 27, 2022

7:00 am – 8:00 am	Continental Breakfast
7:00 am – 5:00 pm	Registration
7:30 am – 12:15 pm	**VASCULAR FELLOW PROGRAM** Moderator: Venita Chandra, MD
7:30 am – 12:15 pm	**GENERAL SURGERY RESIDENT PROGRAM** Moderator: Gabriela Velazquez, MD
7:30 am – 2:00 pm	**STUDENT MENTOR PROGRAM** Moderator: Nathan Orr, MD
12:15 pm – 12:45 pm	Lunch Break
12:45 pm – 3:45 pm	**TECHNOLOGY FORUM – DIDACTIC & HANDS-ON** Moderator: Mounir Haurani, MD
4:00 pm – 6:00 pm	**SCIENTIFIC SESSION I** Moderators: Jason Lee, MD & Karan Garg, MD
4:00 pm – 4:12 pm	1 **Psoas Muscle Area as a Prognostic Factor for Survival in Patients Undergoing EVAR Conversion** Chris Jacobs, Salvatore Scali, Amanda Filiberto, Kyle Staton, Scott Robinson, Michol Cooper, Martin Back, Gilbert Upchurch, Thomas Huber - University of Florida, Gainesville, FL

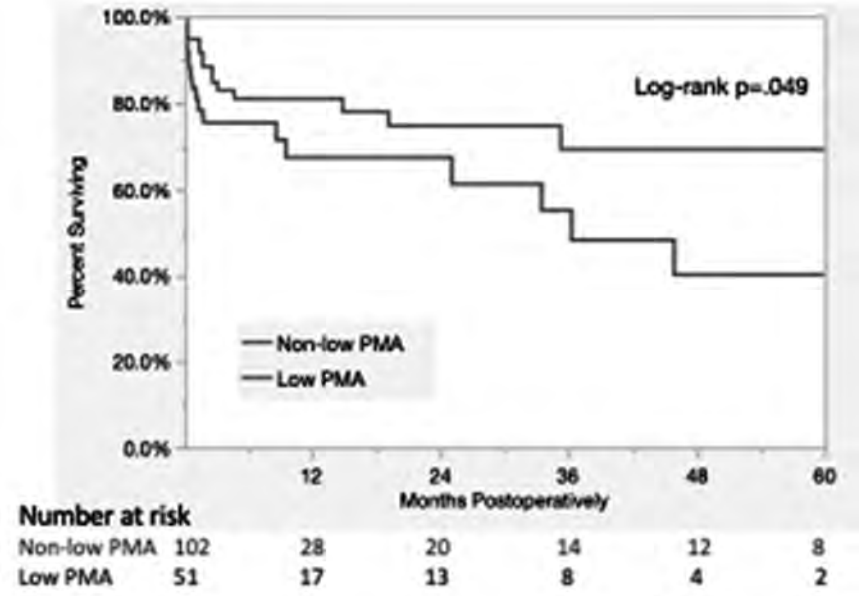
INTRODUCTION AND OBJECTIVES: EVAR conversion (EVAR-c) is technically complex and physiologically demanding. Measures to quantify surgical frailty preoperatively may be useful prior to offering EVAR explant. There is data supporting psoas muscle area (PMA) as a prognostic factor in fenestrated endovascular and open AAA repairs. The purpose of this analysis was to use PMA as an objective measure of frailty and to determine its utility as a predictor of survival for EVAR-c.

METHODS: A retrospective single-center review of all AAA repairs was performed (2002-2019) and EVAR-c procedures were analyzed (n=153). Cross -sectional area of the psoas at the mid-body of the L3 vertebrae were measured. The lowest tertile of PMA in all patients was used as a cutoff value for low PMA and these patients were compared to “non-low” PMA.

RESULTS: Patients with low PMA tended to be older (77 vs. 72, p=.002), less likely to be male (73% vs. 95%, p<.001), and have lower BMIs (26 vs. 29%, p=.002). Time to conversion, total number of EVAR reinterventions and elective presentation as an indication for repair were similar, however; patients with low PMA had larger aneurysms (8.3 vs. 7.5cm, p=.01) and increased post-EVAR sac growth (2.3 vs. 1cm, p=.005). Inpatient mortality was significantly increased for those with low PMA (16% vs. 5%, p=.02) as well as the total number of complications (1.5±1.9 vs. 0.9±1.5). Although MACE and need for inpatient dialysis were similar, those with low PMA had a four-fold increase in requiring dialysis at discharge (18% vs. 4%, p=.01). Long-term mortality was significantly reduced in those with low PMA at 68%, 55% and 40% at 1,3 and 5 years, respectively, compared with 81%, 69% and 69% (p=.049).

CONCLUSIONS: In patients with low PMA, higher complications, increased perioperative mortality and worse long-term survival may be expected. Time to conversion and endovascular remediation are equivalent but rates of sac growth and overall AAA diameter are increased. PMA evaluation offers a potential to stratify which patients may have worse short-term and late outcomes undergoing EVAR-c.

Figure 1. Survival after EVAR Conversion



4:12 pm – 4:24 pm

2

Drug-Eluting Stents are Associated with Good Mid-Term Outcomes for the Treatment of Failing Infrainguinal Bypass Grafts

David Stonko[1], Rebecca Sorber[1], Sarah E. Deery[2], Yasaman Kavousi[1], James H. Black, III[1], Ying Wei Lum[1], Bruce A. Perler[1], Christopher J. Abularrage[1], Caitlin W. Hicks[1] - [1]Johns Hopkins, Baltimore, MD; [2]Maine Medical Center, Portland, ME

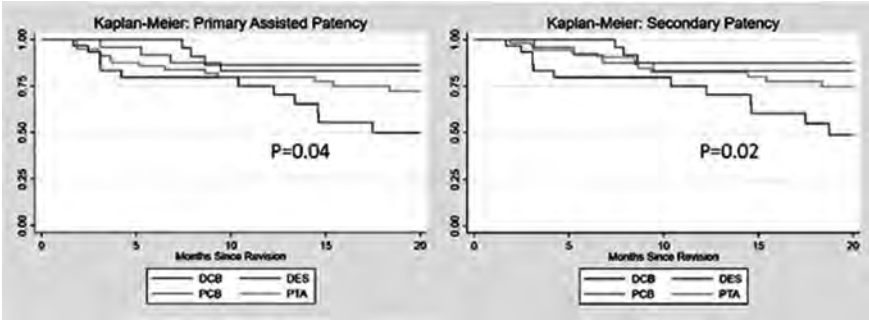
INTRODUCTION AND OBJECTIVES: We previously demonstrated that drug-eluting stents (DES) have reasonable short-term patency for the treatment of infrainguinal bypass stenoses. The aim of this study was to compare mid-term outcomes of DES, plain balloon angioplasty (PTA), percutaneous cutting balloon (PCB), and drug-coated balloon (DCB) interventions for failing infrainguinal bypasses.

METHODS: We conducted a retrospective review of patients with infrainguinal bypass stenoses treated by endovascular intervention (08/2010-07/2021). The primary outcome was primary patency (PP). Secondary outcomes were primary-assisted patency (PAP), secondary patency (SP) and limb salvage (LS). Outcomes are described stratified by treatment using Kaplan-Meier curves with log-rank tests at 6-month intervals post-intervention.

RESULTS: 73 consecutive patients with 154 discrete infrainguinal bypass stenoses were identified. Mean age was 65.2±10.6 years, 54.8% were male, and 47.9% were Black. 82.2% of patients were originally treated for chronic limb-threatening ischemia, and 57.8% of bypass distal anastomoses were to tibial or pedal targets. Of 154 lesions, 43.5% (n=67) were treated with PTA, 17.5% (n=27) with PCB, 17.5% (n=27) with DES, and 21.4% (n=33) with DCB. Median follow-up was 24.3 months (IQR 8.6-48.4). There was no difference in bypass configuration, conduit choice, or stenosis location (proximal anastomosis, mid-bypass, distal anastomosis). At short-term follow-up (6- and 12-months), there were no significant differences in any outcome between groups (all, $P>0.05$). At 18- and 24-months post-intervention, PAP and SP were best for DES, followed by PCB, PTA, and DCB ($P<0.04$; Figure 1). PP and LS did not differ between modalities at any time point.

CONCLUSION: DES are associated with superior patency rates, and should be considered a primary treatment modality for failing infrainguinal bypasses.

Figure. Kaplan-Meier Curves for 20-Month PAP and SP Follow-Up



4:24 pm – 4:36 pm

3

Comparison of Transcarotid Artery Revascularization and Transfemoral Carotid Artery Stenting Outcomes among Symptomatic and Asymptomatic Patients Based on Lesion Calcification

Jerry Zhu[1], Ajit Rao[2], Windsor Ting[2], Daniel Han[2], Rami Tadros[2], David Finlay[2], John Phair[2], Ageliki Vouyouka[2], Michael Marin[2], Peter Faries[1] - [1]Icahn School of Medicine at Mount Sinai, New York, NY; [2]The Mount Sinai Hospital, New York, NY

INTRODUCTION AND OBJECTIVES: Anatomic details affecting adverse outcomes following transcarotid artery stenting are not well characterized. We compared in-hospital outcomes following transcarotid artery revascularization (TCAR) and transfemoral carotid artery stenting (TFCAS) among symptomatic and asymptomatic patients stratified by degree of lesion calcification.

METHODS: Data from patients in the Society for Vascular Surgery Vascular Quality Initiative database undergoing TCAR (Jan 2017 to Apr 2020) or TFCAS (May 2005 to Apr 2020) and had carotid artery calcification grading was analyzed. Degree of calcification was stratified into three groups: none, <=50% calcification, and >50% calcification.

RESULTS: A total of 9,868 patients (TCAR:4,224; TFCAS:5,644) were included. TCAR patients were generally older, white, smokers, and had more comorbidities than TFCAS patients. Among symptomatic patients, there was no difference in rates of stroke, stroke/TIA, and MI by calcification severity between TCAR and TFCAS. However, there was a trend towards increased risk in all three events with higher calcification only after TFCAS. Symptomatic patients with severe (>50%) calcification had lower rates of death (TCAR:0.9% vs TFCAS:2.8%, P=0.013), stroke/death (TCAR:2.7% vs TFCAS:5.8%, P=0.006), stroke/death/MI (TCAR:3.3% vs TFCAS:6.5%, P=0.007), and postop complications (TCAR:6.0% vs TFCAS:12.4%, P<0.001) compared to TFCAS. Furthermore, TCAR had lower risk of death at all degrees of calcification compared to TFCAS. Similar findings were noted among asymptomatic TCAR patients with >50% calcification, in which the rates of death (TCAR:0.4% vs TFCAS:1.1%, P=0.080) and stroke/death (TCAR:1.5% vs TFCAS:3.1%, P=0.029) were reduced.

CONCLUSIONS: While increased calcification increased rates of adverse events after TFCAS, this trend was not observed after TCAR. Furthermore, TCAR had lower rates of death than TFCAS across all degrees of calcification and lower rates of stroke/death among patients with severe calcification. These findings suggesting that TCAR is protective against death despite anatomic differences and may be particularly beneficial over TFCAS in patients with calcified lesions.

4:36 pm – 4:48 pm 4

Renal Artery Stenosis Due to Entrapment

Dongjin Suh, Victor Hatcher, John Muhonen, Mel J. Sharafuddin - University of Iowa, Iowa City, IA

INTRODUCTION: Entrapment of the celiac artery by the median arcuate ligament and diaphragmatic crura is a known clinical entity. There have been rare reports of extrinsic compression of the renal arteries by the diaphragmatic crura leading to secondary renal pathology.

METHODS: We report recent experience with two patients who presented, within months, with documented renal artery entrapment. Diagnosis was made with a constellation of findings on CT angiography, dynamic duplex sonography, and catheter angiography. Both patients had difficult to control hypertension and one also had recurrent subsegmental renal infarcts. Both patients were treated with surgical decompression of the affected renal artery. Open surgery with exposure via Kocher maneuver followed by mobilization of right kidney including attachments to the right lobe of liver was to allow circumferential exposure of the proximal right renal artery to the aorta. All entrapping tissue was circumferentially released.

RESULTS: Both operations were uncomplicated. At 1month follow-up, renal doppler of both patients demonstrated resolution of dynamic compression of the renal artery. PSV and accelerations indices were all within normal limits. In both patients, improvement in blood pressure control was noted. Discontinuation of anticoagulation was possible in the patient who had recurrent embolic episodes.

CONCLUSION: Extrinsic compression of renal artery by diaphragmatic crura is rare, but a definite anatomic and clinical entity. Work-up should include dynamic imaging to assess for compression of renal arteries during expiration. Surgical decompression of renal arteries is a viable option. Renal artery entrapment should be included in the differential diagnosis in younger patients with hypertension without demonstrable intrinsic disease, especially when anomalous origin of the renal artery or proximity to the diaphragmatic crura are seen on cross sectional imaging.

Figure 1. Patient 1—44-year-old male with history of hypertension and recurrent subsegmental Rt renal cortical infarcts and an otherwise negative embolic work-up. CTA was suggestive of proximal renal artery compression. Selective angiography confirmed Rt renal artery compression on expiration with an associated 50 mmHg dynamic pressure gradient. Intraoperatively, extrinsic compression of the Rt renal artery was identified and was completely released. Post-operatively, he had marked improvement in his blood pressure control on fewer antihypertensive agents. Duplex imaging confirmed resolution of dynamic compression of the Rt renal artery.

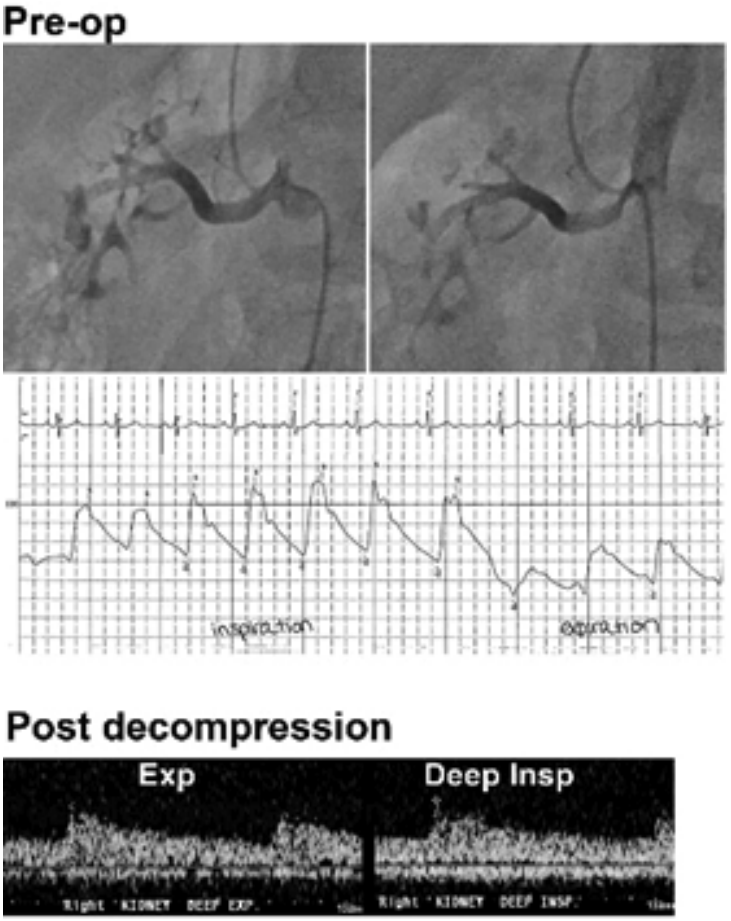
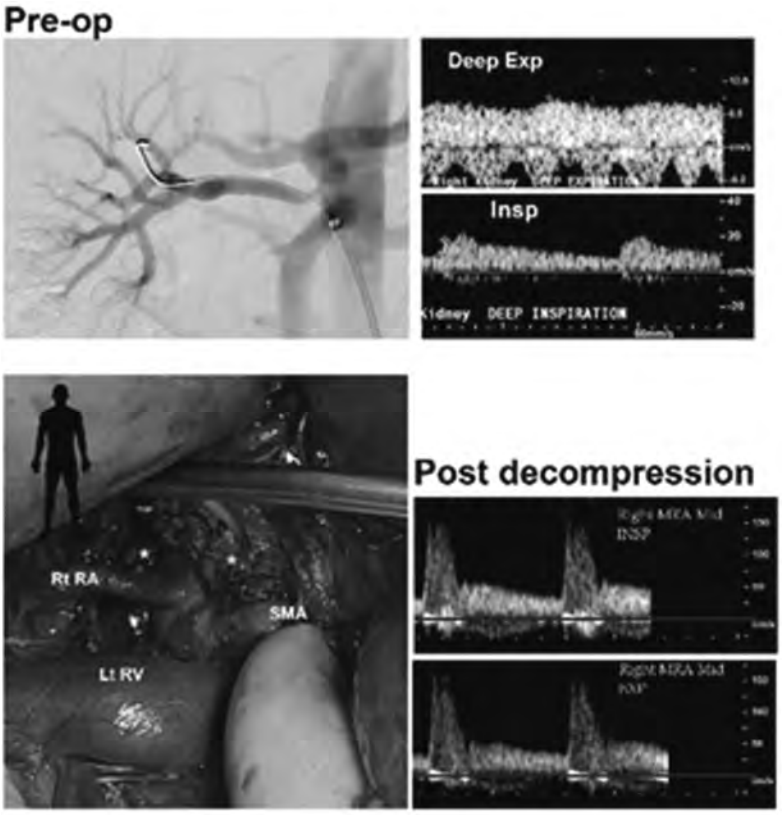


Figure 2. Patient 2—15-yeah-old male with uncontrolled HTN. CTA, catheter angiography and duplex sonography demonstrated Rt renal atrophy and dynamic stenosis of the Rt renal artery during deep expiration. Intraoperatively the artery was circumferentially entrapped by fibromuscular elements of the Rt crus (*), which was released. Post-operatively, the patient's hypertension control improved markedly, and duplex imaging showed resolution of dynamic compression of the Rt renal artery.



4:48 pm – 4:56 pm

5 (RF)

Statin Use Reduces Mortality in Patients Who Develop Major Complications after Transcarotid Artery Revascularization

Heepeel Chang[1], Muhammad Zeeshan[1], Caron B. Rockman[2], Frank J. Veith[2], Igor Laskowski[1], Vikram S. Kashyap[3], Glenn R. Jacobowitz[2], Karan Garg[2], Mikel Sadek[2], Thomas S. Maldonado[2] - [1]Westchester Medical Center, New York Medical College, Valhalla, NY; [2]New York University Langone Medical Center, New York, NY; [3]University Hospitals Cleveland Medical Center, Cleveland, OH

INTRODUCTION AND OBJECTIVES: The impact of preoperative statin use in patients undergoing transcarotid artery revascularization (TCAR) is not well established. The aim of this study was to evaluate the effect of statin on postoperative outcomes after TCAR.

METHODS: Vascular Quality Initiative registry (2012-2020) was queried for patients undergoing TCAR. Patient demographics, perioperative characteristics and 30-day outcomes were compared between patients treated with and without statins at least 30 days preoperatively. Multivariable logistic regression models were used to estimate the effect of statins on postoperative outcomes.

RESULTS: A total of 15,797 patients underwent TCAR, and 10,116 (64%) were males. 14,152 (89.6%) patients were on statin preoperatively (Table). There was higher incidence of both prior ipsilateral stroke (17.2% vs. 13.5%; P<.001) and recent ipsilateral stroke (≤ 30 days; 7.1% vs. 5.6%; P=.02) in the statin group. Perioperative stroke and major adverse cardiac event (MACE; myocardial infarction, congestive heart failure and dysrhythmia) occurred in 1.5% and 2.4% among patients on statins and 1.4% and 2.3% among those not on statins, respectively. After adjusting for potential confounders and baseline differences, statin use was associated with 62% reduction in the odds of mortality (OR 0.38; 95% CI, 0.19-0.99; P=.047) in patients who developed a perioperative stroke or MACE after TCAR (Figure).

CONCLUSIONS: Statin use was associated with a significant reduction in postoperative mortality in patients who develop a stroke or MACE after TCAR. Therefore, strict adherence to statin is strongly recommended, particularly in patients who may be at high risk of major postoperative complications.

Figure. Predictors of Post-Operative Mortality after Stroke or Major Adverse Cardiac Event

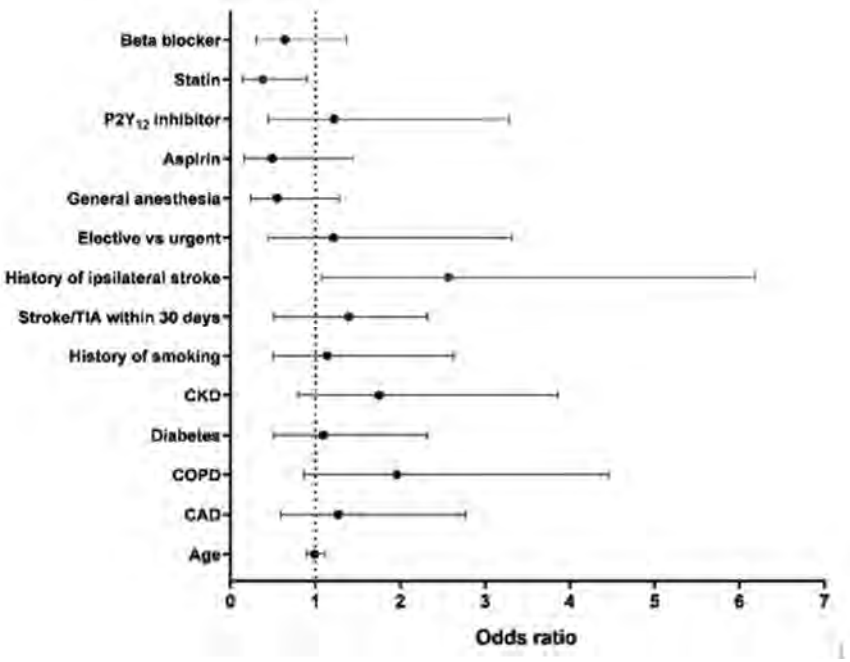


Table. Comparison of Demographics, Co-Morbidities, Procedural Details and Post-Operative Outcomes

	Statin (N=1,645)	No statin (N=14,152)	P value
Age, median (IQR), years	74 (67-80)	75 (65-80)	.085
Male, %	58	65	<.001
Comorbidities, %			
Coronary artery disease	23	26	.008
Congestive heart failure	6	7	.437
Dysrhythmia	24	22	.133
Hypertension	87	91	<.001
Diabetes	29	33	<.001
COPD	19	19	.856
Chronic kidney disease	40	39	,416
History of ipsilateral stroke	14	17	<.001
Procedural detail, %			
Operative time, median (IQR), minutes	66 (52-85)	65 (51-85)	.219
Contrast used, median (IQR), mL	25 (18-40)	25 (17-40)	.943
Technical success	99.5	99.5	.592
Postoperative outcomes, %			
Stroke	1.5	1.4	.697
Major adverse cardiac event (MACE)	2.4	2.3	.805
Myocardial infarction	0.7	0.6	.501
Congestive heart failure	0.2	0.4	.307
Dysrhythmia	1.7	1.5	.599
Mortality	0.7	0.4	.059
Stroke/MACE	3.7	3.5	.642
Mortality among patients who had perioperative stroke or MACE	11.5	5.7	.079

4:56 pm – 5:04 pm

6 (RF)

The Effect of Socioeconomic Status on Amputation Outcomes and Limb Salvage Interventions

Tyler Buckley[1], Ahsan Zil-E-Ali[2], Ryan King[1], Ravi Veeraswamy[1], Faisal Aziz[2], Elizabeth Genovese[1] - [1]Medical University of South Carolina, Charleston, SC; [2]Penn State Health, Hershey, PA

INTRODUCTION AND OBJECTIVES: Disadvantaged patients have historically undergone higher level amputations without prior limb salvage interventions when compared with other populations. We sought to determine if racial and socioeconomic status is associated with decreased access to vascular care, less attempts of primary revascularization and higher level amputations.

METHODS: The Vascular Quality Initiative was queried from 2012-2020 for patients with below-knee and above-knee amputations (AKA). Outcomes based on race and distressed community index (DCI) as a marker of socioeconomic status were investigated. Baseline characteristics, prior revascularization on the ipsilateral limb and amputation outcomes were compared between races and the five DCI groups (prosperous, comfortable, mid-tier, at-risk, distressed) using Pearson chi and student t-test.

RESULTS: The cohort consisted of 14,816 cases of amputations. As seen in table I, when comparing DCI groups, the AKA rate was highest in the distressed group while prior revascularization was lowest ($p<0.001$). Thirty-day and one-year mortality were equal among the groups as well as the postoperative complication rate. Ambulation at long term follow up progressively decreased through the groups from 60.5% in the prosperous group to 49.6% in the distressed group ($p<0.001$). When comparing races (table II) the black group had a higher rate of AKA and a lower rate of primary revascularization when compared to the white group. The black group also had the lowest rate of ambulation at follow up.

CONCLUSIONS: Lower socioeconomic status and minority race is associated with a higher rate of AKA, a lower rate of primary revascularization and a low chance at future ambulation nationwide.

Full Program & Abstracts

Table 1. Outcomes by Distressed Community Index

	Prosperous	Comfortable	Midtier	At-risk	Distressed	p-value
30d Mortality	6.8%	7.0%	7.2%	6.4%	6.1%	0.422
1y Mortality	19.6%	20.7%	21.1%	19.4%	20.1%	0.512
5y Mortality	25.2%	26.6%	28.9%	26.8%	28.6%	0.009
AKA	38.3%	40.5%	42.8%	44.5%	47.2%	< 0.001
Prior Intervention	51.6%	50.9%	47.2%	47.0%	46.0%	< 0.001
Postop Complication	18.1%	18.1%	17.6%	15.8%	17.7%	0.119
Postop SSI	1.5%	1.8%	1.3%	1.6%	1.5%	0.779
Postop MI	2.7%	1.9%	2.0%	1.5%	1.7%	0.008
Postop Dysrhythmia	3.5%	3.5%	3.0%	2.6%	3.8%	0.052
Postop Respiratory Complication	3.7%	4.1%	3.4%	3.3%	4.1%	0.270
Return to OR	8.1%	8.4%	8.8%	7.6%	9.2%	0.200
Return for bleed	0.3%	0.2%	0.3%	0.3%	0.5%	0.346
Return for infection	2.3%	2.9%	2.6%	2.2%	2.9%	0.248
Return for revision	7.3%	7.4%	8.0%	6.7%	8.3%	0.127
Follow Up Infection	7.7%	7.5%	8.3%	6.5%	5.2%	0.170
Follow Up Revision	12.3%	10.6%	10.6%	13.0%	10.9%	0.255
Follow Up Ambulation	60.5%	53.4%	52.4%	49.9%	49.6%	< 0.001

Table 2. Outcomes by Race

	White	Black	Other	p-value
30d Mortality	6.9%	6.1%	7.2%	0.145
1y Mortality	20.7%	19.4%	19.0%	0.132
5y Mortality	27.7%	27.1%	24.9%	0.143
AKA	41.7%	46.3%	38.5%	< 0.001
Prior Intervention	49.8%	46.5%	44.5%	< 0.001
Postop Complication	17.4%	17.4%	18.2%	0.788
Postop SSI	1.5%	1.4%	2.0%	0.397
Postop MI	2.1%	1.7%	1.9%	0.185
Postop Dysrhythmia	3.2%	3.5%	3.0%	0.565
Postop Respiratory Complication	3.6%	3.9%	4.8%	0.137
Return to OR	8.0%	9.0%	9.4%	0.075
Return for bleed	0.4%	0.3%	0.5%	0.605
Return for infection	2.6%	2.6%	2.5%	0.971
Return for revision	7.1%	8.1%	8.6%	0.051
Follow Up Infection	7.8%	5.2%	6.9%	< 0.001
Follow Up Revision	12.5%	10.0%	10.4%	0.017
Follow Up Ambulation	55.9%	47.9%	51.2%	< 0.001

5:04 pm – 5:12 pm

7 (RF)

Association of Gun Violence with Vascular Injury and Worse Mortality Outcomes in the Pediatric Population

Momodou L. Jammeh, Annie Hess, J. Wesley Ohman - Washington University in St. Louis School of Medicine, St Louis, MO

INTRODUCTION: Trauma remains the leading cause of death in children and adolescents. Here, we explore the hypothesis that vascular injury portends worse outcomes in pediatric patients after trauma.

METHODS: A retrospective, single-center analysis of patients 18 years or younger treated for traumatic injuries sustained between 2004 and 2019. An institutional trauma registry was queried for demographic and clinical data. Differences in mortality, need for operative intervention and injury mechanism were assessed.

RESULTS: During the 15-year study period, 1567 patients were treated for traumatic injuries with a 12% (190) incidence of vascular trauma. Patients with vascular injury had a higher prevalence of penetrating trauma (64% vs 32%, $p < 0.0001$) and black race (70% vs 55%, $p < 0.001$) relative to those with general injuries. Gun-related injury (89%) was the primary source of penetrating trauma. Overall, patients with vascular trauma faced greater morbidity as indicated by higher injury severity scores (20.7 ± 1.1 vs 12.0 ± 0.34, $p < 0.0001$) at the time of presentation. In addition, need for operative intervention (65% vs 22%, $p < 0.0001$) and death on arrival (6.8% vs 2.5%, $p < 0.001$) were more likely in the vascular injury group. Black race (OR 6.1 [2.4-20.6], <0.001), penetrating trauma (OR 5.8 [2.7-14.2], <0.001) and vascular injury (OR 2.9 [1.4-5.6], 0.002) were associated with higher likelihood of mortality. On multivariate analysis, penetrating trauma (OR 3.4 [1.4-10.0], 0.013) was the only independent risk factor for death when accounting for vascular injury, age, race, gender and method of payment.

CONCLUSION: Gun violence has become major source of morbidity for pediatric trauma patients and carries a high risk for vascular injury, predisposing to worse mortality outcomes. These patients are typically of higher acuity and frequently require operative intervention.

5:12 pm – 5:24 pm

8

The Importance of a Multi-Disciplinary Approach for Improving Abdominal Aortic Aneurysm Screening in a Non-HMO Healthcare System

Matthew W. Mell, Janet P. Wells, Angela Aguirre - University of California Davis, Sacramento, CA

INTRODUCTION AND OBJECTIVES: Over 70% of U.S. Medicare beneficiaries are not enrolled in a fully integrated HMO (i.e. Medicare Advantage) healthcare system, yet efforts to optimize AAA screening for this population remain largely unstudied. We sought to describe for this cohort the current state and opportunities for improved screening.

METHODS: At-risk patients at a non-fully integrated medical center without a record of AAA imaging were identified. Data included demographics, previous out-of-network imaging and in- or out-of-network status. Qualified individuals after chart review were offered AAA screening by mail and follow-up call. Primary outcome was acceptance of screening. If declined, reasons for refusal were documented.

RESULTS: Of 1073 eligible patients (age 73±2 years) review of medical records and calls confirmed previous imaging in 46%. Of the remaining 578, in -network patients (n=117 [20%]) were more likely to have a PCP (95% vs. 53%, p<.001). Successful contact was more likely for patients with a PCP (OR 2.36, 95% CI 1.62 - 3.45; p<.001). Of those offered screening, 31.9% accepted. Those with a PCP were more likely to accept screening (36% vs. 6%, p=.01). Conversely, the most common declined reason was deference to the PCP (58%; TABLE). On multivariate analysis having a PCP remained the strongest predictor of screening (OR 8.81, 95% CI 1.09 - 71.06, p=.04). Of those completing screening, either ectatic (13%) or aneurysmal disease (4%) requiring surveillance was identified.

CONCLUSIONS: PCPs are key to optimizing AAA screening rates, and out-of-network patients are particularly vulnerable due to a lack of a PCP. To improve screening rates, at-risk patients need a PCP, and PCPs need active partnership with vascular surgeons to increase patient buy-in.

Table. Reason for Declining AAA Screening

Reason	Percent
Deference to the PCP	58%
Uninterested	13%
Not concerned about risks	8%
COVID Concerns	6%
Insurance problems	6%
Distance/ travel concerns	5%
Financial concerns	1%
No reliable transportation	1%
Other	1%

Full Program & Abstracts

5:24 pm – 5:36 pm

9

Endovascular (TEVAR) Versus Open Surgical Repair for the Management of Unruptured Thoracic Aortic Aneurysms in Patients with Marfan's Syndrome

Steven H. Liu[1], Brandon Muncan[1], Emily Wang[1], Nicholas J. Moehringer[1], Ayush Sangari[1], Lucyna Z. Price[2] - [1]Renaissance School of Medicine at Stony Brook University, Stony Brook, NY; [2]Stony Brook University Hospital, Stony Brook, NY

INTRODUCTION AND OBJECTIVES: Treatment of thoracic aortic aneurysms (TAA) in patients with Marfan's syndrome has classically involved open repair; however, emerging data suggest similar efficacy between endovascular (TEVAR) approaches and conventional surgery. As there are limited data regarding this population, we compare 5-year morbidity and mortality rates after TEVAR versus open repair for unruptured TAA in Marfan's patients.

METHODS: Study timeframe was 1 January, 2010-31 December 2020. We used the TriNetX database to identify patients with Marfan's syndrome who had undergone TEVAR, as well as a propensity score-matched cohort of patients who had undergone open repair for first instance unruptured TAA. We compared postoperative mortality, reintervention, and complication rates using Kaplan-Meier estimates and Cox models over a 5-year follow up period.

RESULTS: Before matching, outcomes of 58 TEVAR patients were compared with 297 open repair patients. At 5 years, total reintervention rate, reintervention via endovascular technique, and paraplegia were more common in the TEVAR group. After matching for age, sex, and past cardiovascular surgery, only total reintervention rate and endovascular reintervention remained higher in the TEVAR group; Tables 1 and 2. Incidence of mortality, aortic dissection, limb ischemia, and renal failure was similar between groups.

CONCLUSIONS: Complications were common in patients undergoing TEVAR and open repair. Although reintervention via endovascular technique was more frequent in patients treated initially with TEVAR, incidence of mortality and other adverse outcomes were similar between groups. As endovascular approaches advance, further research is needed to better elucidate the role of TEVAR in treating TAAs in patients with Marfan's syndrome.

Table 1. 5-Year Outcomes before Propensity Score Matching

	Initial TEVAR (N = 58)	Initial Open Repair (N = 297)		
Outcome	5-Year KM Estimate	5-Year KM Estimate	HR	95% CI
Mortality	13.15%	8.57%	1.66	(0.66-4.19)
Aortic dissection	37.50%	14.08%	1.97	(0.45-8.61)
Limb ischemia	1.75%	0.39%	4.84	(0.30-77.34)
Paraplegia*	10.52%	3.09%	4.56	(1.53-13.57)
Renal failure	34.16%	20.82%	1.58	(0.89-2.81)
Reintervention				
All approaches*	28.48%	9.03%	3.95	(2.04-7.67)
Open approach	12.00%	8.61%	1.55	(0.62-3.87)
Endovascular approach*	23.31%	0.84%	32.20	(7.21-143.91)

*TEVAR: thoracic endovascular aneurysm repair; KM: Kaplan-Meier; HR: hazard ratio; CI: confidence interval *Denotes statistical significance*

Table 2. 5-Year Outcomes after Matching

	Initial TEVAR (N = 56)	Initial Open Repair (N = 56)		
Outcome	5-Year KM Estimate	5-Year KM Estimate	HR	95% CI
Mortality	13.60%	10.93%	1.55	(0.44-5.50)
Aortic dissection	37.50%	29.17%	0.73	(0.14-3.90)
Limb ischemia	1.82%	0.00%	-	-
Paraplegia	10.91%	4.92%	3.29	(0.65-16.05)
Renal Failure	33.50%	25.64%	1.54	(0.68-3.46)
Reintervention				
All approaches*	29.38%	13.94%	2.71	(1.05-6.99)
Open approach	12.43%	13.94%	1.01	(0.33-3.15)
Endovascular approach*	24.04%	2.22%	12.73	(1.65-97.97)

*TEVAR: thoracic endovascular aneurysm repair; KM: Kaplan-Meier; HR: hazard ratio; CI: confidence interval. *Denotes statistical significance*

5:36 pm – 5:48 pm

10

A Comparison of Revised Frailty Score Range Association with National Lower Extremity Bypass Outcomes by Gender

James M. Dittman[1], Kedar S. Lavingia[2], Robert A. Larson[2] - [1]Virginia Commonwealth University School of Medicine, Richmond, VA; [2]VCUHealth, Richmond, VA

INTRODUCTION AND OBJECTIVES: The Risk Assessment Index (RAI) frailty scoring system, developed in an all-male veteran cohort, has recently undergone revision and validation using a general surgical sample from the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database. We set forth to investigate the association between RAI-rev scores and lower extremity bypass outcomes by gender in the NSQIP database.

METHODS: All elective cases recorded from 2015-2019 in the NSQIP Targeted Lower Extremity Open database were paired with the Participant User File using Case IDs. Cohorts were defined by EMR-recorded gender. Top quartile postoperative length of stay was defined as extended. Aggregate cohort demographics, perioperative factors, and 30-day outcomes were compared using unpaired t-test and Fisher's exact test. Adjusted odds-ratios for outcomes were generated with a multivariate binary logistic regression model utilizing prior ipsilateral bypass versus percutaneous intervention, graft utilization, dirty/infected wound, smoking, hypertension, diabetes, and steroid use as covariates. Calculated RAI-rev scores <25 were defined as the non-frail reference range.

RESULTS: 8,155 bypass cases were recorded in NSQIP from 2015-2019 including 2,498 (31%) performed in women who had slightly lower RAI-rev scores on average (22.1 ± 5.8 vs 24.2 ±5.1; p=0.0001). While univariate trends suggested increasing incidence for most outcomes across both represented genders, there were more non-significant aOR for women than men (Table). Analysis of 4 patients with RAI-rev scores >45 resulted in no significant aOR.

CONCLUSIONS: Our study is the first to find that outcomes other than mortality are significantly predicted by RAI-rev score ranges in lower extremity bypass. Stratification of aOR by gender suggests that additional validation of frailty scores may be warranted as these systems gain wider use.

Full Program & Abstracts

Table.

Outcome	RAI-rev Scores 26-30(aOR, 95% CI; p value)	RAI-rev Scores 31-35(aOR, 95% CI; p value)	RAI-rev Scores 36-40(aOR, 95% CI; p value)	RAI-rev Scores 41-45(aOR, 95% CI; p value)
All-Cause Mortality (F)	NS	9.10; 2.56-32.39; <0.001	NS	Model NS
All-Cause Mortality (M)	NS	6.90; 3.32-14.34; <0.001	17.30; 7.07-42.33; <0.001	45.14; 12.71-160.34; <0.001
Procedure-related Death (F)	Model NS	19.42; 5.15-73.21; <0.001	14.70; 2.44-88.74; 0.003	Model NS
Procedure-related Death (M)	Model NS	4.43; 1.93-10.13; <0.001	12.80; 4.89-33.55; <0.001	28.53; 7.19-113.30; <0.001
Extended Hospital Course (F)	1.62; 1.27-2.07; <0.001	2.39; 1.63-3.51; <0.001	NS	NS
Extended Hospital Course (M)	1.60; 1.35-1.89; <0.001	2.68; 2.14-3.36; <0.001	4.12; 2.84-5.99; <0.001	4.95; 2.21-11.10; <0.001
Bleeding (F)	1.52; 1.17-1.99; 0.002	2.02; 1.34-3.05; <0.001	NS	NS
Bleeding (M)	1.32; 1.07-1.64; 0.01	2.14; 1.63-2.82; <0.001	2.81; 1.81-4.37; <0.001	NS
MI or Stroke (F)	NS	NS	NS	NS
MI or Stroke (M)	2.07; 1.36-3.13; <0.001	3.88; 2.40-6.28; <0.001	4.31; 2.02-9.16; <0.001	NS
Cardiac Arrest (F)	Model NS	NS	NS	NS
Cardiac Arrest (M)	Model NS	3.76; 1.34-10.52; 0.01	14.61; 4.66-45.82; <0.001	25.43; 4.75-136.05; <0.001
Reintubation (F)	Model NS	Model NS	Model NS	Model NS
Reintubation (M)	Model NS	4.93; 2.37-10.25; <0.001	10.86; 4.50-26.23; <0.001	21.04; 5.42-81.67; <0.001
SNF Disposition (F)	2.21; 1.69-2.91; <0.001	3.99; 2.66-5.97; <0.001	NS	NS
SNF Disposition (M)	2.27; 1.82-2.83; <0.001	4.51; 3.44-5.91; <0.001	4.69; 3.03-7.27; <0.001	5.17; 2.11-12.69; <0.001

Full Program & Abstracts

5:48 pm – 6:00 pm

11

Operative Autonomy: Assessing Resident Impact on Surgical Outcomes in Below the Knee Amputations

Alexander Simmonds, Diana Otoya, Kedar S. Lavingia, Michael Amendola - Virginia Commonwealth University, Richmond, VA

INTRODUCTION AND OBJECTIVES: Gradual increases in autonomy with attending physician oversight are consider crucial to successful training in surgery as well as safe patient care. The Veterans Affairs Surgical Quality Improvement Program (VASQIP) follows patient outcomes and has yet to be examined for outcomes of specialty and includes information about attending surgeon oversight in the operation room (OR). We set forth to examine VASQIP database to determine the frequency of resident operative independence during below the knee amputations (BKA).

METHODS: All VASQIP records for BKA from 1990 to 2018 were examined and categorized based on if the attending was scrubbed during case. Case matching was performed based on gender, diabetes, preoperative renal failure, smoking status, steroid use, CHF, COPD, and open wound infections. Comorbidities, pre- and postoperative outcomes for each procedure within 30 days were tabulated. 3-day post-operative outcomes including return to the operating room, wound infections mortality were assessed in addition to operative time, hospital length of stay and transfusion requirements. Student t-test* and Fisher's Exact Test** were utilized.

RESULTS: A total of 28,768 BKA VASQIP records were obtained. After case control matching, 5,234 cases remained. Cases were identified with the attending surgeon noted as being scrubbed during the case (n=2617), or not scrubbed (n=2617). Patients were similar in comorbidities across both.

CONCLUSIONS: Increased resident independence during BKA at VA hospitals is associated with a statistically significant length of stay, return to OR, blood transfusion, and sepsis. There was no statistically significant increase in operative time, 30-day mortality, wound infection, or total complication. Further research is required in assessing the risks associated with surgical training, resident supervision, and resident preparedness for independent practice.

Table.

	Attending Scrubbed (n=2617)	*Attending Not Scrubbed (n=2617)*	*p*
Operative Time (hours ±SD)	1.41 ± 0.86	1.41 ± 0.728	0.73
Post op LOS (Days ±SD)	17.56 ± 20.49	16.14 ± 18.54	0.009*
30-day mortality (%)	298 (11.4%)	258 (9.9%)	0.073
Any Complication (%)	469 (17.9%)	505 (19.3%)	0.201
Deep Wound Infection (%)	73 (2.8%)	95 (3.6%)	0.084
Dehiscence (%)	50 (1.9%)	38 (1.5%)	0.197
Return to OR (%)	583 (22.3%)	745 (28.5%)	<0.001*
Bleeding req >4 units (%)	5 (0.2%)	22 (0.8%)	0.001*
Sepsis (%)	36 (1.4%)	66 (2.5%)	0.003*
Post Op MI (%)	24 (0.9%)	31 (1.2%)	0.343

6:00 pm – 6:30 pm **INDUSTRY SESSION**
Sponsored by: Boston Scientific

6:30 pm – 8:00 pm **WELCOME RECEPTION**
All attendees, guests & exhibitors are welcome.

Full Program & Abstracts

Friday, January 28, 2022

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
7:00 am – 9:04 am	**SCIENTIFIC SESSION II** Moderators: Gabriela Velazquez, MD & Matthew Smeds, MD
7:00 am – 7:12 am	12 **The Use of Paclitaxel-Coated Devices in the Treatment of Peripheral Arterial Disease is not Associated with Increased Mortality or Amputations** Evan Bair, Gregory G. Salzler, Beau McCarver, Shengxuan Wang, Benjamin Greif, Matthew Major, Evan J. Ryer, James R. Elmore - Geisinger Medical Center, Danville, PA

INTRODUCTION AND OBJECTIVES: Strategies for the most effective treatment for peripheral arterial disease (PAD) remain controversial among clinicians. Several trials have shown improved primary patency of infrainguinal interventions with the utilization of paclitaxel-coated balloons or stents (DCBS) compared to conventional balloons or stents. However, a 2018 meta-analysis suggested an increased mortality risk for patients receiving DCBS, resulting in an international pause in the use of DCBS. A 2021 meta-analysis by the same group suggested an increased risk of major amputation following DCBS use in peripheral arterial revascularization procedures. Here we report our long-term institutional outcomes comparing uncoated devices to DCBS.

METHODS: We performed a retrospective review of all patients who underwent peripheral arterial angioplasty, stenting, atherectomy, or a combination between 2011 and 2020 within our regional healthcare system. Univariate and survival analyses were performed using standard statistical methods to assess the primary endpoints of overall survival, 5-year survival, and amputation-free survival.

RESULTS: A total of 2717 patients were identified, of whom 1965 were treated with conventional uncoated devices and 752 were treated with DCBS. Univariate analysis demonstrated longer survival time for patients receiving conventional angioplasty (20.9 months vs. 9.8 months, $p<0.0001$). However, log-rank test found no significant difference in overall survival probability ($p=0.9375$), 5-year survival probability ($p=0.9876$), and amputation-free survival ($p=0.3310$). Proportional hazards model found that patients using beta blockers or aspirin, or with dyslipidemia, prior coronary artery bypass graft (CABG), or hypercoagulability were at increased risk of mortality following treatment with paclitaxel or conventional devices.

CONCLUSIONS: DCBS are not associated with increased mortality or worse amputation-free survival in this real-world cohort of patients treated for PAD. Additionally, our data indicates that mortality is linked to pre-existing patient factors rather than type of device utilized.

7:12 am – 7:24 am

13

Large Fenestrations Versus Scallops for the SMA During Fenestrated EVAR: Does it Matter?

Sabina M. Sorondo, Shernaz S. Dossabhoy, Kenneth Tran, Vy T. Ho, Jordan R. Stern, Jason T. Lee - Stanford Health Care, Palo Alto, CA

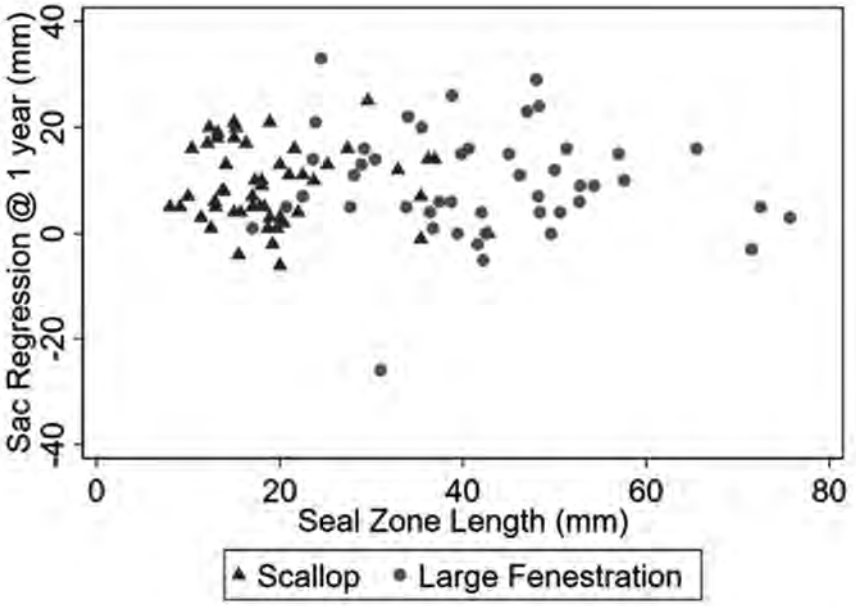
OBJECTIVE: FEVAR is an established customized treatment for aortic aneurysms with two general strategies for the superior mesenteric artery (SMA). Outcomes comparing SMA single-wide scallops to large fenestrations with the commercially available ZFEN device are scarce. We sought to determine the outcomes of seal zone and sac regression between the two SMA configurations.

METHODS: We retrospectively reviewed our prospectively maintained complex EVAR database for all Cook ZFEN patients undergoing SMA scallop or large fenestration configurations. All first post-operative CT scans (1-30 days) were analyzed on Terarecon for proximal seal zone lengths, and standard follow-up anatomic and clinical metrics were tabulated.

RESULTS: A total of 234 consecutive ZFEN patients from 2012-2021 were reviewed, and 137 had either a scallop or large fenestration for the SMA with imaging available for analysis (72 scallops and 65 large fenestrations). Mean follow-up was 35 months. Mean proximal seal zone length was 19.5±7.9 mm for scallop vs 41.7±14.4 mm for large fenestration groups (P<.001). There was no difference in sac regression between scallop and large fenestration at latest follow-up (10.1±10.9 mm vs. 11.0±12.1, P=.63) (Figure). Percentage of proximal neck reinterventions in the large fenestration group was 1.3% (n=1) and 3.8% (n=3) in the scallop group (P=.33). Overall, 30-day mortality (1.3% vs 2.5%, P=.51) and all-cause three-year mortality (72.5% vs. 81.7%, P=.77) were not significantly different.

CONCLUSION: Despite attaining longer seal lengths, large SMA fenestrations were not associated with a difference in sac regression compared to scalloped SMA configurations. There were no differences in reinterventions or overall long-term mortality between the two SMA strategies.

Figure. Sac Regression at 1 Year Between Two SMA Configurations



7:24 am – 7:36 am

14

Impact of Socioeconomic Status on Major Amputation in Patients with Peripheral Vascular Disease and Diabetes Mellitus

Rachel R. Fan[1], Andrew K. Gibson[4], Matthew R. Smeds[1], Emad Zakhary[1,2] - [1]Saint Louis University School of Medicine, St. Louis, MO; [2]St. Louis Veteran Affairs Health Care System, St. Louis, MO; [3]Clinical Epidemiology Center, Research and Development Service, St. Louis Veterans Affairs Health Care System, St. Louis, MO; [4]Veterans Research and Education Foundation of St. Louis, St. Louis, MO

INTRODUCTION: Both peripheral vascular disease (PVD) and diabetes mellitus (DM) are leading causes of lower extremity amputation. The Area Deprivation Index (ADI) is a tool used to estimate socioeconomic status based off a persons' nine digit zip-code, and this value has been shown to correlate with poor health outcomes. We sought to understand the effect of socioeconomic status on major amputation in diabetic patients with PVD in a single center.

METHODS: All patients presenting to a single center with dual diagnosis of PVD and DM from 2012 to 2017 were identified using ICD 9/10 codes. Patients undergoing major amputation (below knee and above) were compared to those who did not have amputation. ADI as well as comorbid disease processes were identified. Categorical variables were analyzed using Chi-Square or Fisher's exact test, and t-tests were used for continuous variables. Logistic regression was performed to test the association between socioeconomic status and amputation status.

RESULTS: A total of 2009 patients were identified, of which 85 underwent major amputation. After adjusting for comorbidities, patients in the amputation group had higher ADI scores as compared to those who did not have amputation (median ADI score 8 vs. 6, $p<0.05$). Logistic regression modeling demonstrated an Odds Ratio of 1.10 (95% confidence interval: 1.01-1.19) indicating the odds of being in the amputation group was increased by 10% for every one point increase in the ADI score.

CONCLUSION: After controlling for comorbidities, patients with DM and PVD residing in neighborhoods with lower socioeconomic status have increased odd of undergoing major lower-limb amputation than those from neighborhoods with higher socioeconomic status despite receiving care at the same institution. Further study is warranted to determine factors contributing to this difference.

7:36 am – 7:48 am

15

Differences in Aortic Intramural Hematoma Contrast Attenuation on Multi-Phase CTA Predict Long-Term Aortic Morphologic Change

Charles Decarlo, Zachary Feldman, Brandon Sumpio, Arminder Jassar, Abhisekh Mohapatra, Matthew J. Eagleton, Anahita Dua, Jahan Mohebali - Massachusetts General Hospital, Boston, MA

INTRODUCTION: Evolution of aortic intramural hematoma (IMH) over time ranges from resolution to degeneration and is difficult to predict. We sought to measure differences in contrast attenuation between arterial and delayed phase computed tomographic angiography (CTA).

METHODS: IMH institutional data were gathered for 2005-2020. Hounsfield unit ratio (HUR) was measured as hematoma Hounsfield unit (HU) on delayed phase divided by arterial phase on CTA. Aortic growth and effect of HUR were determined using a linear mixed effects model. Freedom from adverse aortic event, defined as the composite of intervention, recurrence of symptoms, and rupture, was determined using Kaplan-Meier analysis.

RESULTS: IMH occurred in 73 patients; 27 met the inclusion criteria (Table). HUR ranged from 0.38-1.92 (mean:0.98). Baseline aortic diameter growth independent of HUR measurement was 0.49mm/yr (95% CI:-1.23-2.2), however, in patients with HUR > 1 (increased enhancement on delays) aortic diameter grew 5.05mm/yr per HUR unit (95% CI:0.56-9.56; p=0.028). Conversely, in patients with HUR < 1 (diminished enhancement on delays), the aorta shrank consistent with IMH resolution. Aortic adverse events occurred in 14(51.9%) patients at a median of 19 days (IQR:1-95 days); 7(25.9%) patients had recurrence of symptoms, 8(29.6%) required intervention, 5(18.5%) progressed to dissection, and 1(3.7%) had aortic rupture. There was a trend toward an association between higher HUR and composite adverse aortic events (HR 3.21 per 1-unit HUR; 95% CI:0.60-17.3; p=0.18).

CONCLUSION: Increased HUR is associated with increased aortic growth and a trend toward adverse aortic events. Diminished delayed phase enhancement may predict partial or complete IMH resolution. HUR can be used to guide IMH surveillance and treatment.

Table. Anatomic Variables for Intramural Hematomas

		N=27
Initial largest affected aortic diameter, mean (SD)		40.7 (7.0)
Initial IMH thickness, mean (SD)		11.4 (4.0)
Hounsfield unit ratio, mean (SD)		0.98 (0.3)
Symptomatic		24 (89%)
Proximal IMH aortic zone	0	4 (15%)
	2	2 (8%)
	3	18 (69%)
	4	2 (8%)
Distal IMH aortic zone	3	1 (4%)
	4	1 (4%)
	5	13 (50%)
	7	2 (8%)
	8	6 (23%)
	9	2 (8%)
	10	1 (4%)
Associated ulcer-like projection		15 (56%)

Abbreviations: IMH – intramural hematoma

7:48 am – 7:56 am

16 (RF)

Analysis of Publicly Reported Adverse Events in the Vici and Venovo Venous Stent Systems

Yuchi Ma, James Dittman, Kedar S. Lavingia, Michael Amendola - Virginia Commonwealth University, Richmond, VA

INTRODUCTION AND OBJECTIVES: The first two FDA approved stents for treatment of iliofemoral vein obstruction, Boston Scientific's VICI and BD's Venovo Venous Stent Systems, were both recalled early 2021, within years of entering market. We set forth to analyze publicly reported adverse events in the FDA Manufacturer and User Facility Device Experience (MAUDE) database to better characterize predominant device and patient issues reported for each system.

METHODS: MAUDE was queried for all adverse event reports for brands "VICI" and "Venovo" from their respective US FDA market approval dates to August 19, 2021. Reported device issues, patient issues, device return status, and intervention performed for each adverse event were compiled and compared utilizing Fisher's exact test.

RESULTS: A total of 50 adverse event reports were compiled for the VICI system and 341 for the Venovo system. The most common device issue reported was migration in VICI (48% vs. 0%; p=0.0001) versus activation failure in Venovo (85% vs. 4%; p=0.0001). A higher proportion of Venovo adverse event reports specified no patient complications or symptoms (90% vs. 26%; p=0.0001) and device return to manufacturer (13% vs. 2%, p=0.07). There were several significant differences between interventions reported following adverse events for each respective device (Table).

CONCLUSIONS: While two venous stent systems were recalled simultaneously, significant differences exist between reported device issues in MAUDE and whether patient injury was involved. Our data suggests that despite recent addition of patient issues to MAUDE reporting, standardized inclusion of reporting specific interventions would greatly assist vascular surgeons monitoring real-time adverse event trends for vascular devices.

Table.

Intervention Performed	**VICI N = 50**	**Venovo N = 341**	**p value**
Stent Extracted	4 (8%)	6 (2%)	0.01
Balloon Expansion of Stent	3 (6%)	7 (2%)	0.08
New Device Utilized	13 (26%)	16 (5%)	0.0001
Stent Applied within Stent	14 (28%)	6 (2%)	0.0001
No Intervention Specified	16 (32%)	303 (89%)	0.0001

Full Program & Abstracts

7:56 am – 8:04 am

17 (RF)

Real World Experience with the Human Acellular Vessel: A Bioengineered Implant for Arterial Repair that Expands Limb Salvage Options

Alexis L. Lauria[1]; Alexander J. Kersey[1], Brandon W. Propper[1], Paul W. White[1], W. Darrin Clouse[2], Daniel R. Calderon[3], Todd E. Rasmussen[4], Joseph M. White[1] - [1]Uniformed Services University of the Health Sciences and Walter Reed National Military Medical Center, Bethesda, MD; [2]University of Virginia, Charlottesville, VA; [3]Heart and Vascular Institute, University of Pittsburgh Medical Center, Harrisburg, PA; [4]Mayo Clinic, Rochester, MN

INTRODUCTION AND OBJECTIVES: An infection-resistant, immediately available conduit for trauma and urgent vascular reconstruction remains a critical need for successful limb salvage. While autologous vein remains the gold standard, vein-limited patients and size mismatch are common issues. The Human Acellular Vessel (HAV) (Humacyte, Durham, NC) is a bioengineered conduit with off-the-shelf availability and resistance to infection, ideal characteristics for patients with limited conduit options. This report describes HAV implantation in patients who had exhausted conduit options and would have otherwise faced limb loss.

METHODS: The Food and Drug Administration (FDA) expanded-access program was used to allow urgent implantation of the HAV for arterial reconstruction. Electronic medical records were reviewed with extraction of relevant data including patient demographics, surgical implantation, patency, infectious complications and mortality.

RESULTS: The HAV was implanted in 10 patients requiring vascular reconstruction (Table 1). Graft or soft tissue infection was present in 4 patients. One patient with severe penetrating pelvic injury had four HAV placed to repair bilateral external iliac artery and vein injuries (Figure 1). There was 1 technical failure due to poor outflow, 2 patients died unrelated to HAV use, and 7 lower extremity bypasses maintained patency at an average of 9.1 months (range 1-20 months). No HAV infectious complications were identified.

CONCLUSIONS: This report is the first US series describing compassionate use of the HAV under the FDA expanded-access program for end-stage limb salvage. The HAV demonstrates resistance to infection, reliable patency, and offers surgeons an immediate option when confronted with difficult revascularization scenarios.

Figure. Human Acellular Vessel implantation in a complex trauma patient with contaminated wounds and injury to bilateral iliac arteries and veins. Left: Extensive bilateral groin, pelvis and abdominal injuries, vessels initially shunted. Right: In-situ HAV reconstruction with interposition grafting of the external iliac artery and vein.

Table. Demographics, Operative Characteristics and Outcomes in Human Acellular Vessel Bypass

Case	Age (yrs)	Sex	Indication	Bypass Location	Single / Composite HAV	Re-Intervention	Status
1	70	M	Rest pain	Superficial femoral artery to peroneal artery	Single	None	Primary patency at 20 months
2	58	M	Tissue loss	Common femoral artery to below knee popliteal artery	Composite (2)	Revision for external compression at 1 month Angioplasty for proximal anastomotic stenosis at 12 months	Primary-assisted patency at 19 months
3	83	M	Tissue loss	Common femoral artery to anterior tibial artery	Composite (2)	None	Early post-operative thrombosis due to poor outflow Died 12 months later secondary to COVID
4	72	M	Tissue loss with prosthetic graft infection	Axillary artery to profunda femoris artery	Composite (2)	Emergent re-operation for axillary anastomotic disruption on post-operative day 7	Died secondary to comorbid conditions with withdrawal of care on post-operative day 13
5	38	F	Rest pain	Common femoral artery to anterior tibial artery	Composite (2)	Wound washout for superficial infection at 2 weeks Graft thrombosis treated with thrombolysis and angioplasty at 6 months	Secondary patency at 9 months
6	85	M	Infected prosthetic graft	Superficial femoral artery to posterior tibial artery	Composite with reversed basilic vein	None	Primary patency at 5 months
7	68	M	Tissue loss, cellulitis	Mid-superficial femoral artery to posterior tibial artery	Single	None	Primary patency at 6 months

8	74	M	Tissue loss, cellulitis	Common femoral artery to anterior tibial artery	Composite (2)	None	Primary patency at 1 month
9	48	M	Tissue loss	Common femoral artery to below knee popliteal artery	Composite (2)	None	Primary patency at 4 months
10	20	M	Traumatic iliac, common femoral artery injuries	Bilateral iliac artery and vein	Single, 4 separate HAV	None related to HAV	Early hemicorporectomy due to extensive invasive fungal infection of pelvic soft tissues; HAV patent at time of surgery

Full Program & Abstracts

8:04 am – 8:12 am

18 (RF)

Novel Use of Trans-Carotid Revascularization System for Brachiocephalic Vascular Interventions

Viraj Pandit, Peter Nelson, Steven Vang, Kelly Kempe, Kimberly Zamor, William Jennings, Hyein Kim - University of Oklahoma, Tulsa, OK

OBJECTIVE: As the experience with trans-carotid artery revascularization (TCAR) is expanding, its applicability of TCAR in patients with the more complex brachiocephalic disease has not been described. We examined our experience with TCAR used in combination with other cerebrovascular interventions including retrograde common carotid artery (CCA) stenting and carotid-subclavian bypass.

METHODS: We included patients with significant ICA stenosis amenable to TCAR but also with concomitant hemodynamically significant and clinically significant common carotid or subclavian artery stenosis over a 2-year period. All patients had a supra-clavicular incision with exposure to the CCA. In patients with subclavian stenosis, the carotid-subclavian bypass was performed first (8mm Dacron) and the graft was accessed using the TCAR system for the ICA intervention. In patients with common carotid stenosis, the common carotid was accessed retrograde using the cerebral protection system, and the intervention was performed. Then the TCAR system was converted to antegrade and ICA intervention was completed. All cases were performed under general anesthesia. Cerebral protection (passive or active) and neuromonitoring were used during all procedures.

RESULTS: 71 patients underwent TCAR, and of these, 8.5% (n=6) underwent combined procedures. Two patients had concomitant CCA stenosis and four patients with subclavian artery stenosis. One patient had an occluded contralateral ICA. No patients in the combined group had postoperative complications (stroke or myocardial infarction or cranial nerve injury) and all were discharged home on a postoperative day one. Table 1 summarizes the outcomes for the study population.

CONCLUSION: The novel use of the cerebral protection system for proximal intervention, or incorporating the TCAR system in a hybrid approach to complex brachiocephalic disease is effective in providing safe, comprehensive treatment solutions.

Table. Outcomes

Variables	TCAR (N=71)	TCAR + Brachiocephalic Intervention (N=6)
Symptomatic Carotid Stenosis (%)	59%	16.67%
Operative Time (min)	81±22	186±32
Stroke (%)	1.4% (n=1)	0%
MI (%)	0%	0%

8:12 am – 8:24 am

19

Female Gender is Associated with Worse Outcomes Following Complex Fenestrated or Branched Endovascular Aortic Repair

Brendan Gontarz[1], Ilene Staff[2], Randall DeMartino[3], Akhilesh Jain[2], Rasheed Majeen[2], Elizabeth Aitcheson[2], Parth Shah[2], Edward Gifford[2] - [1]University of Connecticut, Farmington, CT; [2]Hartford Hospital, Hartford, CT; [3]Mayo Clinic, Rochester, MN

INTRODUCTION AND OBJECTIVES: Gender discrepancies during aortic repair are noted to disproportionally affect females. Recent examination of complex fenestrated and branched endovascular aneurysm repair (FBEVAR) at high-volume centers noted equivalent mortality among genders following repair. Whether similar results extend to real-world practice is unknown.

METHODS: Utilizing the Vascular Quality Initiative (VQI) database from 2012-2020, all juxtarenal and type IV aneurysms (sealing zones 5-8) who underwent elective FBEVAR were included. Urgent, symptomatic, ruptured and staged cases were excluded. Demographics, comorbid conditions and technical factors were compared between genders. Our outcomes included in-hospital mortality, any complications, and retreatments. Multivariable logistic regression was used to adjust for patient and procedural factors.

RESULTS: There were 1547 males (77.5%) and 449 females (22.5%) included in our analysis. There were noted differences in pre-operative co-morbid conditions, medical optimization, and technical aspects of the procedure (Table 1). However, no difference was noted in proximal or distal sealing stent, number of fenestrations, or immediate post-procedure endoleak. Overall women had a higher incidence of in-hospital mortality, 5.6% versus 1.9% in men (P<0.001). On multivariable logistic regression female gender was an independent predictor of increased complications (OR 1.672 95% CI: 1.202-2.324, P=0.002), retreatment (OR 2.765, 95% CI: 1.745-4.070, P<0.001), and mortality (OR 2.296, 95% CI: 1.301-4.053, P=0.004).

CONCLUSIONS: Females undergoing FBEVAR had similar extent of disease, number of fenestrations, and incidence of immediate endoleak but worse COPD and lower rates of optimal medical therapy. Despite adjustment for patient and procedural factors, female sex remained associated with worse outcomes. These data strongly support the need to incorporate the increased risks of repair for females when contemplating FBEVAR.

Table. Demographics, Anatomic, Technical Factors and Outcomes in Men and Women Undergoing FBEVAR

Patient Factors	Males (n=1547)	Females (n=449)	P
Age (Median, IQR)	74 (68, 79)	75 (69, 80)	*0.027
BMI (Median, IQR)	27.2 (24.3, 30.9)	26.6 (23.2, 31.0)	*0.025
CHF (%)	233 (15.2)	47 (10.5)	*0.012
CVD	158 (10.2)	58 (12.9)	0.104
CAD	524 (33.9)	107 (23.8)	*<0.001
COPD	563 (36.4)	216 (48.1)	*<0.001
Smoking Status-Ever Smoked-Current	1408 (91.0)500 (32.3)	392 (87.3)174 (38.8)	*0.020*0.011
Pre-op Aspirin	1091 (70.6)	275 (61.2)	*<0.001
Pre-op Statin	1179 (76.2)	299 (66.2)	*<0.001
Prior Aortic Surgery-Open-Endovascular-Both	77 (5.0)67 (4.3)6 (0.4)	8 (1.8)13 (2.9)0 (0.0)	*0.005
Ejection Fraction>50%30-50<30%	803 (74.1)237 (21.9)44 (4.1)	256 (84.2)44 (14.5)4 (1.3)	*<0.001
Max Aortic Diameter, mm (Median, IQR)	59 (55, 65)	56 (52, 61)	*<0.001
ASA Score (Median IQR)	3.0 (3,4)	3.0 (3,4)	0.802
Anesthesia (%)-General-Regional-Local	1526 (98.6)6 (0.4)15 (1.0)	441 (98.4)3 (0.7)4 (0.9)	0.728
Access-Percutaneous only-Open Femoral only-Percutaneous and Open Femoral-Open Iliac	1025 (66.8)425 (27.6) 79 (5.1)8 (0.5)	265 (59.1)135 (30.3)32 (7.2)14 (3.1)	*<0.001
Number of Devices (Median, IQR)	2 (2, 2)	2 (2, 2)	0.976
Fenestrations Stented (Median, IQR)	3 (2, 4)	3 (2, 4)	0.373
Any endoleak at completion (%)	100 (6.6)	28 (6.4)	0.850
Fluoroscopic Time min (Median, IQR)	61.0 (44.0, 85.0)	67.4 (46.0, 92.9)	*0.003
Total Time min (Median, IQR)	215 (167, 284)	238 (186, 322,5)	*<0.001
Estimated Blood Loss mL (Median, IQR)	250 (100, 500)	250 (100, 562.3)	*<0.008
Intra-Op transfusions (%)	244 (15.8)	156 (34.7)	*<0.001
Length of Stay Days (Median (IQR)	3 (2.5)	4 (2.7)	*<0.001
In-hospital Mortality (%)	30 (1.9)	25 (5.6)	*<0.001

8:24 am – 8:36 am

20

Endovascular Repair in Patients with Heritable Thoracic Aortic Disease

Julie R. Solomon, J. Westley Ohman, Alan C. Braverman - Washington University School of Medicine, St. Louis, MO

INTRODUCTION AND OBJECTIVES: In patients with heritable thoracic aortic disease (HTAD), endovascular repair of aortic aneurysm and dissection may be lifesaving but is associated with increased risk of complications. This study reports our experience with endovascular aortic and branch vessel repair in patients with HTAD.

METHODS: A retrospective analysis of patients with HTAD at our institution who underwent endovascular aortic and/or branch vessel repair was performed.

RESULTS: Twenty-nine patients with HTAD (20 male; mean age 45 ± 13 years) underwent 37 endovascular procedures between 2006-2020. Indications for repair were acute complications of aortic dissection (n=10) or aneurysm rupture (n=3), and elective aortic repair (n=18; 10 chronic dissections and 8 chronic aneurysms). Six procedures repaired branch vessel aneurysms or dissections. Twenty-five (68%) proximal landing zones were in the native vessel, 11 (30%) were in a surgical graft or elephant trunk and 1 was in an endograft. Outcomes are listed in Table I. Thirty-six (97%) procedures were technically successful and none required surgical conversion. Two patients (7%) died: one from sepsis (33 days post-procedure) and one from presumed pseudoaneurysm rupture (116 days post-procedure). Two procedures were complicated by stroke and one patient developed paraparesis. Six aortic endografts (16%) developed stent-induced new entry tears (SINEs) identified 20 ± 15 days post-procedure. Seven endografts (19%) developed a Type I endoleak and 9 (24%) developed a Type II endoleak. Within 30 days, 2 (5%) endografts required reintervention. After 30 days, 15 additional endografts (41%) required reintervention.

CONCLUSIONS: Endovascular repair in select patients with HTAD can manage acute and chronic complications of aortic aneurysm and dissection at relatively low risk. However, risk of endoleaks, SINEs, and reinterventions is high.

Table. Early and Late Outcomes after Endovascular Repair in Patients with HTAD

	Total (n=37)	MFS (n=16)	LDS (n=14)
Technical Success	36 (97)	15 (94)	14 (100)
Length of Hospital Stay (days)	13 ± 14	9 ± 6	19 ± 20
Follow-Up Duration (months)	54 ± 41	60 ± 48	66 ± 48
Stroke	2 (5)	0 (0)	1 (7)
Major Adverse Cardiac Event	4 (11)	2 (13)	0 (0)
Acute Kidney Injury	7 (19)	1 (6)	5 (36)
Paraparesis	1 (3)	0 (0)	0 (0)
Groin Complications (total)	6 (16)	1 (6)	3 (21)
Hematoma	4 (11)	1 (6)	2 (14)
Pseudoaneurysm	2 (5)	0 (0)	1 (7)
Reintervention (Total)	17 (46)	9 (56)	7 (50)
Open	11 (30)	5 (31)	5 (36)
Endovascular (Total)	6 (16)	4 (25)	2 (14)
Aortic	2 (5)	2 (13)	0 (0)
Non-aortic (Embolization)	4 (11)	2 (13)	2 (14)
Endoleak (Total)	16 (43)	10 (63)	5 (36)
Type 1	7 (19)	4 (25)	3 (21)
Type 2	9 (24)	6 (38)	2 (14)
SINE	6 (16)	1 (6)	2 (14)
Deaths (All-Cause)	2 (5)	0 (0)	1 (7)

In total, underlying conditions included Marfan syndrome (n=15), Loeys-Dietz (n=9), vascular Ehlers-Danlos syndrome (n=2), and nonsyndromic HTAD (n=3). Categorical variables are presented as number (%). Continuous variables are presented as mean ± standard deviation. n, number of procedures performed; MFS, Marfan syndrome; LDS, Loeys-Dietz syndrome; SINE, stent-induced new entry; Major adverse cardiac events included postoperative heart failure and/or arrhythmia.

8:36 am – 8:48 am

21

Clinical Outcomes of a Diagnostic and Management Protocol for Popliteal Artery Entrapment Syndrome at a Large Referral Center

Amir Ghaffarian, Reginald Nkansah, Elina Quiroga, Nam Tran, Benjamin Starnes, Niten Singh - University of Washington, Seattle, WA

OBJECTIVE: Popliteal Artery Entrapment Syndrome (PAES) is a rare clinical entity without a standardized algorithm for diagnosis. Our objective was to evaluate clinical outcomes using a unique diagnosis and management algorithm for PAES.

METHODS: We retrospectively reviewed patients diagnosed with PAES at a single institution between 2013 and 2021. Demographics, physical exam findings, non-invasive imaging results, and angiographic images were assessed to validate a diagnostic and management algorithm (Figure).

RESULTS: Thirty extremities in 20 patients were treated for PAES (Table). Physical exam revealed a pulse decrement with provocative maneuvers in 90% of treated limbs. Noninvasive studies to include treadmill exercise testing revealed a mean ABI drop of 0.27 and positional duplex demonstrated peak systolic velocity increase by a mean ratio of 1.72 with provocative maneuvers. Diagnostic arteriography was performed in all patients and revealed well-developed collaterals in 100% of treated limbs and complete effacement of the popliteal artery with active provocative maneuvers. Surgical exposure occurred via a posterior approach using a longitudinal incision and intraoperative duplex was performed in all cases. Staged bilateral PAES release occurred in 10 patients and type III PAES was diagnosed in 90%. Wound complications occurred in 4 limbs and included seroma and hypertrophic scarring. All patients experienced symptomatic relief with median follow-up of 4 months.

CONCLUSIONS: We report 100% technical and clinical success in patients with PAES diagnosed and managed using our clinical algorithm. Dynamic angiography to confirm the diagnosis and intraoperative duplex to confirm complete surgical release are essential for successful clinical outcome.

Figure. Clinical Algorithm for Management of Popliteal Entrapment Syndrome

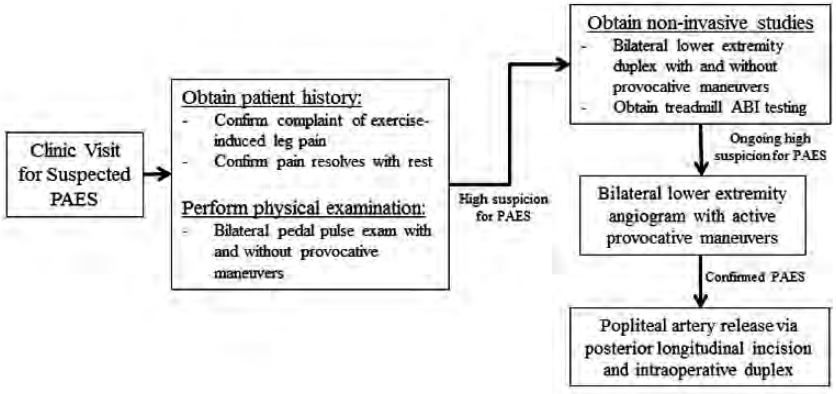


Table. Summary of Outcome Data

Variables	
Age range in years (mean)	14-50 (27)
Female sex (%)	73.3
CTA/MRA performed, n (%)	9 (30)
CTA/MRA negative for PAES, n (%)	8 (89)
Average ABI drop post-exercise	0.27
Duplex PSV ratio increase with provocative maneuvers	1.72
Median operative time in minutes (IQR)	87 (79.5-97)
Wound healing complication, n (%)	4 (13)
Median follow up time in months (IQR)	4 (1.25-11.25)

8:48 am – 8:56 am

22 (RF)

Analysis of Concomitant and Isolated Venous Injury in Military Lower Extremity Trauma

Anne E. O'Shea[1], Matthew Burgess[2], David S. Kauvar[1] - [1]Brooke Army Medical Center, Fort Sam Houston, TX; [2]US Army Institute of Surgical Research, Fort Sam Houston, TX

OBJECTIVES: The implications of major venous injury to the lower extremity are not well established. We aimed to determine the significance of concomitant and isolated femoropopliteal venous injury and assess the impact of surgical management strategies on limb outcomes.

METHODS: The Fasciotomy and Vascular Injury Outcomes Database was queried for limbs sustaining femoropopliteal arterial, venous, or concomitant injuries in Iraq or Afghanistan between 2004-2012. Demographics, injury patterns and severity, interventions, and outcomes were compared between patients sustaining isolated arterial injuries (IAI) and concomitant arteriovenous injuries (AVI). In limbs with any venous injury, outcomes were compared between those undergoing venous (VR) and ligation (VL).

RESULTS: 330 patients (133 IAI, 135 AVI, 62 isolated venous injuries-IVI) were included. AVI was associated with greater limb injury severity: median extremity Abbreviated Injury Scale (AVI 4 vs. IAI 3, p=0.01), Mangled Extremity Severity Score >7 (25.9% vs. 13.5%, p= 0.01), multi-level vascular injury (6.7% vs. 0.8%, p=0.01) and with greater fasciotomy use (83.0% vs. 69.2%, p=0.01). No differences were present in tourniquet use/time, shunting, or nature of arterial repair. No differences in vascular or limb complications (71.1% vs. 63.9%, p=0.21) or amputation rate (25.9% vs. 18.8%, p=0.16) were present, though limb DVT rate was 12.6% in AVI vs. 7.5% in IAI (p=0.17). Limbs with IVI had a 12.9% amputation and a 74.2% complication rate. Repair (n=103) versus ligation (n=94) of venous injuries was not associated with a difference in amputation (18.4% vs. 25.5%, p=0.23) or limb complication rates (71.8% vs. 72.3%, p=0.94).

CONCLUSION: Despite higher extremity injury severity and more frequent fasciotomies, concomitant venous injury was not associated with poorer limb salvage or complications. With nontrivial amputation and complication rates, IVI is indicative of severe limb trauma. Repair of femoropopliteal venous injuries does not appear to influence limb outcomes.

8:56 am – 9:04 am

23 (RF)

Evaluating Neutrophil-to-Lymphocyte Ratio as a Predictive Tool for Post- Operative Outcomes in Patients Undergoing Open Lower Extremity Revascularization Procedures

Lily S. F. Adler, Emann M. Rabie, Samantha M. Shave, Anoop Alla, Saum A. Rahimi, William E. Beckerman - Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

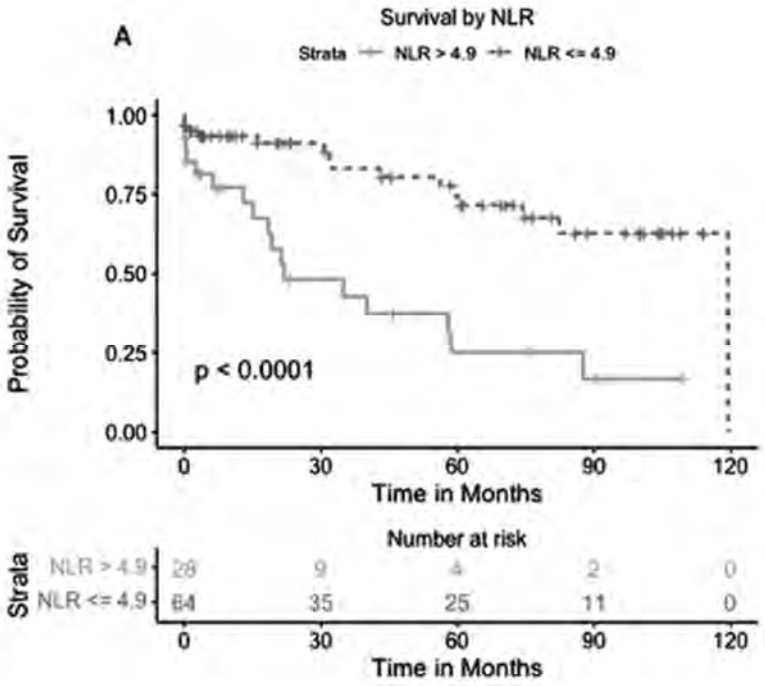
INTRODUCTION AND OBJECTIVES: Elevated neutrophil-to-lymphocyte ratio (NLR), a marker of systemic inflammation, has been shown to correlate with worse outcomes in patients undergoing vascular surgery. Limited data exists on the association of NLR with outcomes in patients undergoing lower extremity vascular surgery. We sought to investigate whether preoperative NLR correlates with outcomes in patients undergoing open lower extremity revascularization procedures.

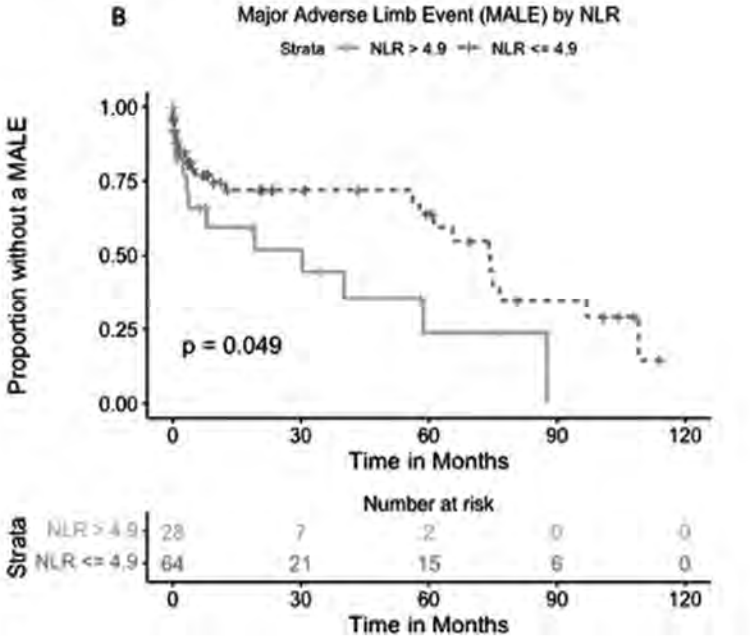
METHODS: We conducted a retrospective analysis of a prospectively maintained database of patients who underwent open lower extremity revascularization procedures from January 2011 to January 2013 (N=179). Preoperative NLR was calculated within six months of surgery. Primary outcomes were major adverse limb event (MALE) or death. The maximally-ranked statistic method was used to determine the NLR cut-off point. Kaplan-Meier analyses of death and MALE and NLR were used to compare the groups by NLR cut-off point. We conducted a multivariate analysis of the association between NLR and mortality using Cox proportional hazard models, including confounding variables such as age, smoking status, and diabetes. *P*-values <0.05 were considered statistically significant.

RESULTS: Ninety-two patients undergoing surgery from January 2011 to January 2013 were analyzed. The median NLR was 3.1 with IQR [2.3-5.6]. The analysis showed a negative correlation between NLR and mortality (P=0.001) and MALE (P =0.049) (Figures 1A and 1B). Controlling for multiple comorbidities including gender, age, smoking, BMI, diabetes, hyperlipidemia, and hypertension, the NLR cut-off point was a significant independent predictor of mortality (P=0.002), but not MALE (P=0.262).

CONCLUSIONS: This study suggests that NLR is an independent predictor of mortality in patients undergoing open lower extremity revascularizations. Going forward, we plan to expand this study to look at a more recent set of patients.

Figure 1. Kaplan-Meier Analysis of (A) Mortality and (B) Major Adverse Limb Events (MALE) Based on the Experimentally Determined Maximal NLR Cut-Off Point, 4.9. The Log-Rank Method was Used to Compute the P-Value. The Number of Patients in Each Group Can Be Found in the Table Below Each Graph.




B
Major Adverse Limb Event (MALE) by NLR
Strata NLR > 4.9 NLR <= 4.9
Proportion without a MALE
1.00
0.75
0.50
0.25
0.00
p = 0.049
0
30
60
90
120
Time in Months
Number at risk
Strata
NLR > 4.9 28 7 2 0 0
NLR <= 4.9 64 21 15 6 0
0
30
60
90
120
Time in Months

Full Program & Abstracts

9:30 am – 11:00 pm **INTERESTING CASE REPORT SESSION 1**
Moderator: Mark Conrad, MD

CR1
Paradoxical Arterial Embolization of a Missile via the Pulmonary Vein in a Pediatric Penetrating Trauma Patient
M. Libby Weaver[1], Phillip D. Jenkins[2], Faidah Badru[1], Kyle M. Staton[1], Thomas S. Huber[1], Moiz M. Mustafa[1], Samir Shah[1] - [1]University of Florida, Gainesville, FL; [2]University of Florida School of Medicine, Gainesville, FL

CR2
Distal Brachial Artery Embolization for the Treatment of Dialysis Access Steal Syndrome
Brian M. Leoce, Helen S. Wei, Kevin Z. Molnar, Steven M. Hadley, Jr., Joe T. Huang, Michael A. Curi - Rutgers New Jersey Medical School, Newark, NJ

CR3
Concurrent Nutcracker Syndrome and Superior Mesenteric Artery Syndrome Requiring Duodenojejunal Bypass and Left Renal Vein Transposition
Taylor N. Laskowski[1], Alexandre d'Audiffret[1], Sungho Lim[2] - [1]Rush University, Chicago, IL; [2]Rush University, Chicago, IL

CR4
Transthoracic Embolization of a Persistent Endoleak after Aortic Debranching and Zone 0 TEVAR
Gerardo G. Guardiola, Carla K. Scott, Jesus P. Colon, Anna L. Driessen, Felipe A. Pavarino, Marilisa S. Gonzalez, Mirza S. Baig, Melissa L. Kirkwood, Carlos H. Timaran – UT Southwestern, Dallas, TX

CR5
False Lumen Deployment of a CTAG Frozen Elephant Trunk During Acute Aortic Dissection Repair Can Be Rescued with Subacute TEVAR and Distal Petticoat Technique
Kush J. Sharma, Eanas S. Yassa - Spectrum Health/ Michigan State University College of Human Medicine, Grand Rapids, MI

Full Program & Abstracts

	CR6 **Management of Ruptured Common Carotid Pseudoaneurysm Following Trans-Carotid Arterial Revascularization in a Patient with Type III Aortic Arch** Joshua S. Meredith, Brian Kuhn, Andrew Ringer, Patrick Muck, Matthew Recht, Aaron Kulwicki, Mark Broering - Trihealth, Cincinnati, OH
1:00 pm – 2:00 pm	**ASK THE EXPERTS SESSION** **Practical Guide to Your First Three Years** Moderator: Jeanie Ruddy, 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 III**
Moderators: Dawn Coleman, MD & Ravi Rajani, MD

4:00 pm - 4:12 pm 24
Unrecognized Cognitive Impairment is Common in a VA Population with Peripheral Arterial Disease
Eric J.T. Smith, Warren J. Gasper, Peter Schneider, Emily Finlayson, Louise C. Walter, Ken E. Covinsky, Michael S. Conte, James C. Iannuzzi - University of California San Francisco, San Francisco, CA

INTRODUCTION AND OBJECTIVES: Despite the shared pathogenesis of peripheral artery disease (PAD) and vascular-related Cognitive Impairment (CI), there is little data on CI in PAD patients. We hypothesized that CI would be common and associated with worsening clinical status in PAD patients.

METHODS: CI screening was prospectively performed for PAD patients undergoing surveillance at a single Veterans Affairs outpatient clinic from 2020-2021. Overall, 125 PAD patients were screened. CI was defined with a validated cut-off of <26 on the Montreal Cognitive Assessment (MOCA) survey. Worsening clinical status was defined as requiring a revascularization and/or worsening wound status within three months from MOCA assessment. Multivariable logistic regression assessed independent risk factors for CI.

RESULTS: Overall, 77 (61%) had CI, 92% representing new diagnoses. CI was associated with increased age (74.4 vs. 71.8 years, p=0.03), Black race (88% vs. 57%, p=0.02), hypertension (66% vs. 31%, p=0.01), prior stroke/TIA (79% vs. 58%, p=0.03), insulin-dependent diabetes (76% vs. 58%, p=0.05), and post-traumatic stress disorder (PTSD) (80% vs. 57%, p=0.04). Overall, 65 (52%) had a worsening clinical status, which was more common in those with CI (61% vs. 38, p=0.01). On multivariable analysis, major risk factors for newly diagnosed CI included worsening clinical status and Black race (Table).

CONCLUSIONS: Cognitive Impairment is present in most VA-based patients living with PAD and is overwhelmingly underdiagnosed. Patients with worsening clinical status are at high risk, and disparities were noted, as Black race was a significant risk factor. This pilot study suggests CI is a major unrecognized issue in a VA population with PAD, requiring more study to determine its impact on surgical outcomes and how it can be mitigated and incorporated into clinical care.

Table. Factors Associated with Cognitive Impairment

Covariate	AOR	95% CI	*p*-value
Worsening Clinical Status	2.6	1.1-6.4	**0.04**
Black race	14.8	2.1-102.6	**<0.01**
PTSD	6.0	1.8-20.1	**<0.01**
Age	1.1	1.0-1.2	**0.02**
Hypertension	6.5	1.4-29.2	**0.02**
Insulin-Dependent Diabetes Mellitus	2.7	0.8-9.0	0.10
Prior Stroke/TIA	2.5	0.6-10.0	0.20

†Adjusted for: Education, Age, Worsening Clinical Status, Black race, Hypertension, PTSD, Statin use, Insulin-dependent Diabetes Mellitus, Chronic Kidney Disease, Prior Stroke or TIA, and Disease Severity.
‡C statistic =0.81

4:12 pm – 4:24 pm

25

Midterm Clinical Outcomes of Retrograde Open Mesenteric Stenting for Mesenteric Ischemia

Nolan C. Cirillo-Penn[1], Randall R. DeMartino[1], Todd E. Rasmussen[1], Fahad Shuja[1], Jill J. Colglazier[1], Manju Kalra[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: Retrograde open mesenteric stenting (ROMS) has become a mainstay in treatment of mesenteric ischemia, however, follow-up in contemporary studies is limited.

METHODS: Single-center retrospective review of patients undergoing ROMS from 2007-2020 was conducted. Demographics, presentation, procedural details were reviewed. Endpoints were morbidity and mortality, technical success, primary patency, reinterventions, and freedom from clinical recurrence.

RESULTS: ROMS was performed in 34 patients, 19 female (56%). Mean age was 71±10 years. Eighteen patients (53%) presented with acute mesenteric ischemia (AMI), eleven (32%) with acute-on-chronic (ACMI), and five (15%) with chronic mesenteric ischemia (CMI). Etiology was chronic atherosclerosis with/without in-situ thrombosis in 28 patients (82%), SMA dissection in three, and one each with embolic, vasculitic, and non-occlusive ischemia. Four patients (12%) had prior mesenteric procedures (3 Celiac/1 SMA stent) and one had unsuccessful transbrachial stenting attempt. Technical success, defined as successful stenting through retrograde approach was 91%; three remaining patients were treated with transbrachial stenting in two patients and iliomesenteric bypass in one. Covered stents were utilized in 21 patients (64%). Eight patients (23%) required thromboembolectomy and nine (26%) underwent patch angioplasty. Thirty-day mortality rate was 35%, all in patients with AMI (10) or ACMI (2). Eighteen patients (53%) underwent bowel resection, all presenting acutely. Early reinterventions were required in 5 patients (15%); two redo ROMS with thrombectomy and endarterectomy, two percutaneous stent extensions, one aortic septum fenestration. At a median follow-up of 3.7(0.1-8.4) years, cumulative reintervention rate was 24% (8 patients, all four late reinterventions were endovascular with no conversion to bypass), primary patency was 73% (primary-assisted patency 91%, secondary patency 97%), and freedom from clinical recurrence was 95%.

CONCLUSIONS: ROMS carries high rates of technical success in patients with mesenteric ischemia, despite high chronic atherosclerotic burden. While mid-term patency rates are acceptable, early mortality and bowel resection remain common in acute presentations.

4:24 pm – 4:36 pm

26

Increased Regional Market Competition Lowers Threshold for Revascularization in Asymptomatic Carotid Artery Stenosis

Rebecca A. Sorber[1], Courtenay M. Holscher[1], Devin S. Zarkowsky[2], Christopher J. Abularrage[1], James H. Black, III[1], Caitlin W. Hicks[1] - [1]The Johns Hopkins Hospital, Baltimore, MD; [2]University of Colorado Anschutz School of Medicine, Denver, CO

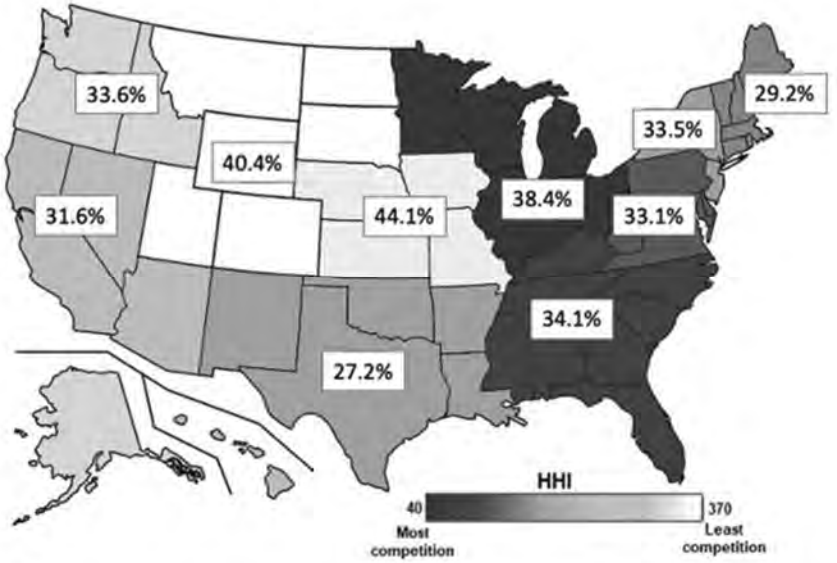
INTRODUCTION AND OBJECTIVES: Revascularization practices for asymptomatic carotid stenosis (ACAS) vary widely among physicians. Our study examines the association of regional market competition with ACAS revascularization thresholds.

METHODS: We included all patients undergoing carotid revascularization in the VQI endarterectomy and stenting databases (2016-2020). High-grade stenosis was defined as ≥80%. We calculated the Herfindahl-Hirschman Index (HHI; measuring physician market competition) for US regions. Logistic regression was used to examine the association between degree of stenosis at revascularization with HHI stratified by symptomatology, adjusting for revascularization modality and traditional risk factors.

RESULTS: Of 92,243 carotid interventions, 61.9% were performed for ACAS and 38.1% for symptomatic carotid stenosis (SCAS). Patients undergoing revascularization for moderate-grade ACAS (vs. high-grade) were less likely to be on aspirin (85.6% vs. 86.3%) and clopidogrel (41.3% vs. 45.1%, both $p<0.05$), but equally likely to be on statins (85.6% vs. 85.7%, $p=0.70$). There were significant regional differences in the proportion of carotid revascularization procedures performed for moderate-grade ACAS (Figure). After adjusting for baseline differences between groups, market competition was independently associated with higher odds of revascularization for moderate versus high-grade ACAS (OR:1.02 per 10pt ΔHHI, 95%CI:1.01-1.03). There was no association of market competition with degree of carotid stenosis at time of revascularization among SCAS patients (OR:1.00 per 10pt ΔHHI, 95%CI:1.00-1.01). ACAS patients with moderate-grade stenosis had higher odds of in-hospital stroke or death compared to high-grade stenosis patients (OR:1.28, 95%CI:1.05-1.56).

CONCLUSIONS: Increased local market competition is associated with a lower revascularization threshold for ACAS but not SCAS. These findings, combined with the increased risk of perioperative stroke/death among moderate-grade ACAS patients, suggest that competition among physicians may result in a higher tolerance for increased operative risk in patients who might otherwise be reasonable candidates for surveillance.

Figure. Percentage of ACAS Revascularizations Performed for <80% Stenosis by HHS Region



4:36 pm – 4:48 pm

27

Pre-Existing Systolic Dysfunction is the Most Powerful Predictor of Failed Arteriovenous Fistula Maturation

Christian C. Faaborg-Andersen, Christopher R. Ramos, Keri Minton, Jaime Benarroch-Gampel, Victoria J. Teodorescu, Ravi R. Rajani - Emory University School of Medicine, Atlanta, GA

INTRODUCTION: Patients requiring hemodialysis access creation often have significant comorbid conditions which may impact access maturation. Underlying cardiac dysfunction likely plays an important role in the maturation of arteriovenous fistulae (AVF). The effect of specific parameters of cardiac function on successful AVF creation has not previously been explored.

METHODS: A retrospective chart analysis of patients undergoing first-time AVF creation at a single center from 2011-2018 was performed. Patients with a transthoracic echocardiogram within the 12 months prior to surgery were included. Standard demographic and perioperative variables were collected, in addition to echocardiographic and vascular mapping data. The primary outcome was access maturation, defined as use of the access site for hemodialysis at 3, 6, and 12 months after surgery.

RESULTS: 121 patients met inclusion criteria with a cumulative AVF maturation rate of 57% (69/121) in this select population. Patients with pre-existing systolic cardiac dysfunction were ten times less likely to see their AVF mature by six months ($p = < 0.001$) and the overall maturation rate at any timepoint was nearly halved in patients with systolic dysfunction (38.2 vs. 64.4%, $p = 0.009$). Perioperative venous diameter, access site location, and the type of fistula did not differ significantly between patients with and without systolic dysfunction. Multivariable analysis demonstrated a history of coronary artery disease and pre-existing systolic dysfunction ($p < 0.05$) were associated with lower rates of access maturation one year after surgery.

CONCLUSIONS: Systolic cardiac dysfunction is the most important non-modifiable variable associated with failed AVF maturation. Patients requiring hemodialysis with significant pre-existing cardiac dysfunction may not be appropriate for permanent access creation and long-term catheter use should be seriously considered as an alternative.

Table. Variables Associated with Echocardiogram-Proven Systolic Cardiac Dysfunction with Access Maturation

Covariate	Systolic dysfunction, any (n=34)	No systolic dysfunction (n=87)	**OR [95% CI]**	**P-value**
Age on date of surgery, yrs	55	54	1.01 [0.96-1.04]	.590
Gender, women, N (%)	10, (29.4%)	40, (46%)	0.49 [0.21-1.16]	.096
Diabetes mellitus	22, (64.7%)	57, (65.5%)	0.97 [0.42-2.22]	.933
Hypertension	33, (97.1%)	86, (98.9%)	0.38 [0.02-6.31]	.487
Congestive heart failure	30, (88.2%)	42, (48.3%)	8.04 [2.61-24.75]	**<.001**
Coronary artery disease	14, (41.1%)	10, (11.5%)	5.39 [2.09-13.92]	**<.001**
Prior percutaneous coronary intervention	6, (17.6%)	4, (4.6%)	4.45 [1.17-16.91]	**.019**
LV ejection fraction, < 35%	18, (52.9%)	0, (0%)	2.20 [1.51-3.20]	**<.001**
Diastolic dysfunction, > Grade 2	15, (44.1%)	32, (36.8%)	1.41 [0.62-3.17]	.410
Access site; Lower arm (vs. Upper arm)	16, (47.1%)	35, (40.2%)	1.32 [0.59-2.93]	.494
Arterial anastomosis; Radial (vs. Brachial)	18, (52.9%)	41, (47.1%)	1.26 [0.57-2.79]	.565
Venous anastomosis; Basilic (vs. Cephalic)	8, (23.5%)	18, (20.7%)	1.18 [0.46-3.04]	.732
Preoperative arterial diameter, mm	3.74	3.64	1.08 [0.72-1.62]	.713
Preoperative venous diameter, mm	3.87	3.86	0.98 [0.65-1.49]	.924
Overall access maturation (at any time)	13, (38.2%)	56, (64.4%)	0.34 [0.15-0.78]	**.009**
Access maturation by < 6 months after DOS	4, (11.8%)	49, (56.3%)	0.10 [0.03-0.32]	**<.001**

4:48 pm – 4:56 pm

28 (RF)

Role of Growth Factors in Smooth Muscle Cell Migration in Tissue Engineered Vascular Grafts

Lauren N. West-Livingston[1], Young Min Ju[1], Gabriela A. Velazquez[2], Anthony Atala[1], Sang Jin Lee[1] - [1]Wake Forest School of Medicine, Winston Salem, NC; [2]Atrium Health Wake Forest Baptist, Winston Salem, NC

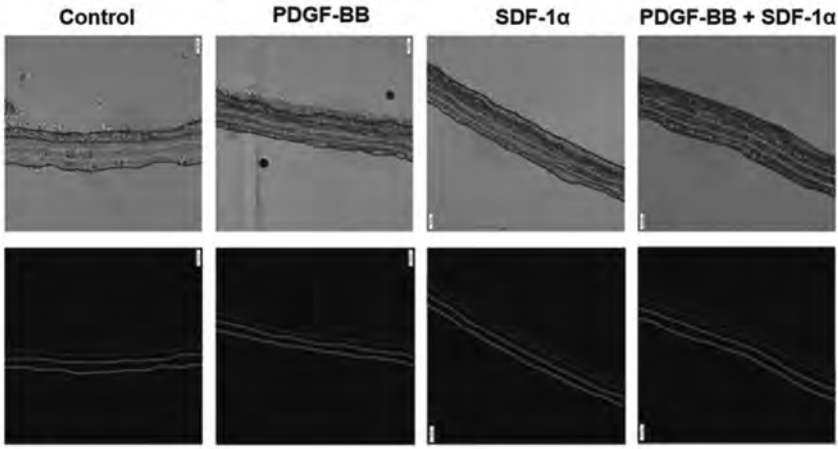
INTRODUCTION AND OBJECTIVES: This study sought to utilize growth factors to promote the migration of smooth muscle cells (SMC) into an electrospun vascular scaffold. The hypothesis was that the use of growth factors would allow for acellular tissue-engineered vascular grafts that are capable of recruiting smooth muscle cellular proliferation and infiltration *in situ.*

METHODS: Scaffolds electrospun with poly(ε-caprolactone) (PCL)/collagen polymers were surface modified through the passive adsorption of platelet-derived growth factor with two beta subunits (PDGF-BB) and stromal derived growth factor 1α (SDF-1α) at various concentrations, individually and together. Single-factor studies investigated each factor at concentrations of 100 ng/mL, 250 ng/mL, and 500 ng/mL. Dual-factor studies investigated the combined effects of 100 ng/mL PDGF-BB and 500 ng/mL of SDF-1α.

RESULTS: Compared to unmodified controls, scaffolds modified with growth factors showed higher rates of smooth muscle cell proliferation. Notably, scaffolds bioconjugated with a concentration of 100 ng/mL PDGF-BB alone and a concentration of 500 ng/mL SDF-1α alone demonstrated the greatest degree of smooth muscle cell proliferation compared to other single-factor concentrations, which confirmed ideal concentrations reported by other studies. A novel finding was that the combination of these growth factors at the aforementioned concentrations showed synergy in the ability to increase the degree of SMC migration into the depth of the electrospun scaffold.

CONCLUSIONS: This series of experiments verifies that growth factors promote proliferation of SMCs on an electrospun scaffold, and that combining multiple factors can optimize migration of SMCs farther into the thickness of electrospun scaffolds in an *in vitro* setting.

Figure.



4:56 pm – 5:04 pm

29 (RF)

Outcomes of Carotid Artery Stenting in Patients with Carotid Tandem Lesions

Nadin Elsayed[1], Munir Paul Moacdieh[1], Taiwo Dodo-Williams[1], Asma Mathlouthi[1], Raghu Motaganahalli[2], Mahmoud Malas[1] - [1]University of California San Diego, La Jolla, CA; [2]Indiana University School of Medicine, Indianapolis, IN

INTRODUCTION AND OBJECTIVES: Management of tandem lesions of the common carotid artery and the ipsilateral carotid bifurcation is challenging. Endovascular techniques have been helpful in managing these complex lesions; either combined with endarterectomy or with stenting alone. However, data on outcomes of total carotid artery stenting for tandem lesions is scarce. We aim to describe the impact of tandem lesions on outcomes of transcarotid (TCAR) and transfemoral (TFCAS) carotid stenting.

METHODS: We reviewed the VQI database for carotid artery stenting. Multivariable logistic regression analysis was used to assess the association between tandem lesions and in-hospital outcomes.

RESULTS: A total of 15,775 underwent TFCAS and 20,673 underwent TCAR. In each procedure, 3.6% of patients had tandem lesion. Patients with tandem lesion were younger, more likely to have high grade stenosis, and to be operated on under general anesthesia. After adjusting for potential confounders, there was no difference in the risk of stroke, death, stroke/TIA, stroke/death, and extended length of stay (ELOS) between tandem vs non-tandem lesion in patients undergoing TCAR. On the other hand, the presence of tandem lesion was associated with higher risk of stroke/TIA (OR: 1.5, 95% CI (1.002-2.3) P=.049) and ELOS (OR: 1.3, 95% CI (1.04-1.6), P=.022) (Table).

CONCLUSIONS: The presence of tandem lesions did not seem to impact the risk of adverse events in patients undergoing TCAR. However, tandem lesions were associated with 50% increased risk of stroke/TIA and 30% increased risk of ELOS in patients undergoing TFCAS. These results support the advantage of flow reversal over distal embolic protection devices (DEP) as it may be difficult deploying DEP in distal lesions. Studies comparing outcomes of TCAR vs TFCAS in patients with tandem lesions are warranted.

Table. Multivariable Logistic Regression Analysis of Adverse Outcomes Comparing Patients Who Had Tandem LES

	TCAR (Tandem vs. non tandem)		**TFCAS (Tandem vs. non tandem)**	
	OR (95% CI)	**P value**	**OR (95% CI)**	**P value**
Stroke/death	0.9 (0.5-1.7)	0.777	1.2 (0.8-1.9)	0.316
Stroke/TIA	1.02 (0.6-1.8)	0.932	1.5 (1.002-2.3)	**0.049**
Stroke	0.9 (0.4-1.8)	0.777	1.4 (0.8-2.5)	0.174
Death	1.05 (0.3-3.3)	0.937	1.5 (0.9-2.4)	0.095
ELOS	1.1 (0.9-1.3)	0.310	1.3 (1.04-1.6)	**0.022**

5:04 pm – 5:12 pm

30 (RF)

Endovascular Repair of Delayed Endologix AFX Graft Failure is Superior to Open Repair with Explant

Michael P. Bianco, Elizabeth A. Blazick, Kimberly T. Malka, Truc M. Ta, Robert E. Hawkins, Paul H. S. Bloch, Brian W. Nolan, Nathan J. Aranson - Maine Medical Center, Portland, ME

INTRODUCTION AND OBJECTIVES: Prior studies have described delayed failure of the Endologix Endovascular AAA System (AFX) with resultant aneurysm sac pressurization and increased risk of rupture. While there is no consensus on operative strategy to deal with this endograft failure, options include re-lining with a contemporary endograft or open graft explant. The purpose of this study is to compare these two surgical treatment options in our own single institution experience.

METHODS: A retrospective review was performed of 122 AFX endografts implanted at our tertiary care center from 2013-2019. Thirty-seven patients were found to have delayed endograft failure and subsequently underwent re-line (n=25) or explant (n=12). All re-interventions were performed for endoleak identified on imaging, sac expansion, and/or rupture. Primary composite outcome was successful aneurysm exclusion without mortality at 30 -days. Secondary endpoints included hospital length of stay and operative time. Patients without appropriate follow-up were excluded unless death occurred within the perioperative period.

RESULTS: Thirty-seven patients were identified, of which 25 underwent re-line and 12 explant. There were no differences in age, gender, race comparatively ($p>0.05$), or reason for re-intervention (presence of endoleak, endoleak type, rupture) ($p>0.05$) There was no significant difference in the primary composite endpoint of successful aneurysm exclusion without death within 30-days between graft re-line (76.0%) and explant (75.0%) ($p=0.95$). Graft re-line had a significantly shorter hospital length of stay (2.20±2.25d vs. 8.64±7.38d ($p<0.01$)) and operative time (164.1±110.4min vs. 272.6±113.7min ($p=0.01$)). Additionally, operative time for the re-line cohort was not significantly different than that of their original EVAR ($p=0.29$). There were 3 (25%) deaths in the explant cohort compared to zero in the re-line cohort although 2 (8%) went on to require explant.

CONCLUSIONS: Endograft re-line, although off IFU, does produce analogous aneurysm exclusion rates when compared to explant in Endologix AFX failures, with a reduction in OR time, hospital length of stay and mortality.

5:12 pm – 5:24 pm

31

Anatomic Factors Contributing to External Iliac Artery Endofibrosis in High Performance Athletes

Andrea T. Fisher, Kenneth Tran, Shernaz S. Dossabhoy, Sabina Sorondo, Arash Fereydooni, Jason T. Lee - Stanford University, Stanford, CA

INTRODUCTION AND OBJECTIVES: External iliac artery endofibrosis (EIAE) classically presents in cyclists with intimal thickening of the affected arteries. We sought to determine possible anatomical predisposing factors including psoas muscle hypertrophy, increased iliac tortuosity, and inguinal ligament arterial fixation/compression via case-control comparison of affected and unaffected limbs.

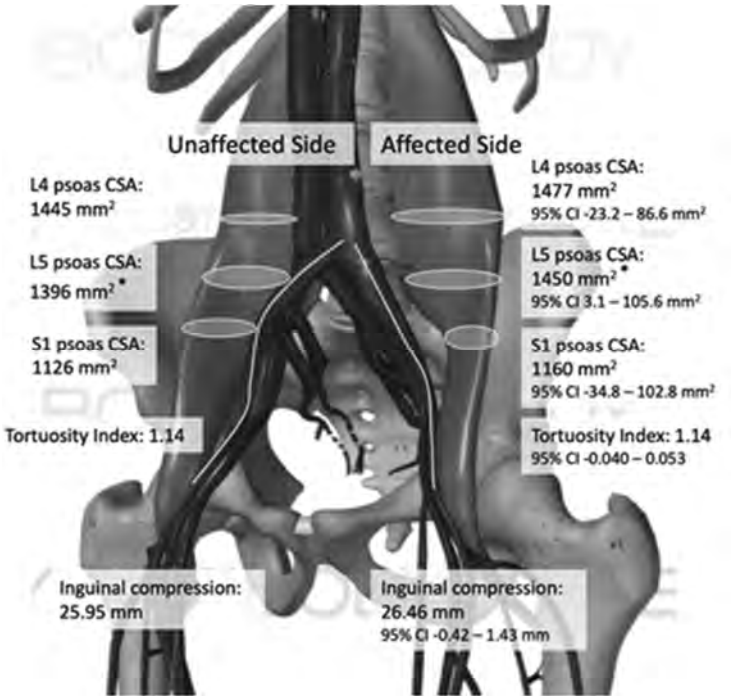
METHODS: All patients with unilateral EIAE treated surgically at our institution were reviewed. Each patient's unaffected side was compared with the affected side using paired t-tests. Psoas hypertrophy was quantified by transverse cross-sectional area (CSA) at L4, L5, and S1 levels. Inguinal ligament compression and tortuosity index for diseased segments were measured on TeraRecon (Figure 1).

RESULTS: Of 35 patients operated on for EIAE from 2000-2021, 27 with available imaging presented with unilateral disease, more commonly left-sided (63%). Most (96%) had external iliac involvement and 26% had ≥2 segments affected: 19% common iliac artery, 15% common femoral artery. The affected limb had greater mean L5 psoas CSA (1450 mm^2 vs. 1396 mm^2, mean difference 54 mm^2, P=0.039). There were no significant differences in L4 or S1 psoas hypertrophy (Fig 2), tortuosity, or inguinal ligament compression. 63% underwent patch angioplasty, 26% bypass, 11% shortening, and 85% underwent additional inguinal ligament release. 84% reported postoperative satisfaction, which was associated with greater difference in psoas hypertrophy at L4 ($p = 0.022$).

CONCLUSIONS: Psoas muscle hypertrophy is most pronounced at L5 and is associated with symptomatic EIAE. Preferential hypertrophy of the affected side correlates with improved outcomes, suggesting psoas muscle hypertrophy as a marker of disease severity.

Figure 1. Psoas CSA (A); Inguinal Ligament Anterior-Posterior EIA Compression Measured by Distance from Inguinal Ligament Crossing the External Iliac Artery (EIA) to Underlying Bone (Pubis) (B), Centerline to Straight-Line Tortuosity (C)

Figure 2.


Unaffected Side
Affected Side
L4 psoas CSA:
1445 mm²
L5 psoas CSA:
1396 mm² *
S1 psoas CSA:
1126 mm²
Tortuosity Index: 1.14
L4 psoas CSA:
1477 mm²
95% CI -23.2 – 86.6 mm²
L5 psoas CSA:
1450 mm² *
95% CI 3.1 – 105.6 mm²
S1 psoas CSA:
1160 mm²
95% CI -34.8 – 102.8 mm²
Tortuosity Index: 1.14
95% CI -0.040 – 0.053
Inguinal compression:
25.95 mm
Inguinal compression:
26.46 mm
95% CI -0.42 – 1.43 mm

5:24 pm – 5:36 pm

32

Lower Extremity Revascularization among Patients with Premature Peripheral Artery Disease Compared to Patients at the Common Age of Presentation in the Vascular Quality Initiative

Tanner Kim, Sarah Loh, Andrew Dewan, Michael Murray, Hamid Mojibian, Arya Mani, Carlos Mena-Hurtado, Cassius Iyad Ochoa Chaar - Yale University School of Medicine, New Haven, CT

INTRODUCTION AND OBJECTIVES: Premature peripheral artery disease (PAD) (age ≤50) is associated with poor outcomes following lower extremity revascularization (LER). However, the specific characteristics and outcomes compared to patients at the common age of presentation have not been examined. The aim of this study is to compare patients with premature PAD to patients with the common age of presentation undergoing LER.

METHODS: All LER procedures (open and endovascular) in the VQI were reviewed. A histogram of patient age at intervention for de novo disease (no prior LER) was used to define the common age of presentation. Characteristics and outcomes of patients with premature PAD were compared to patients treated at the common age of presentation.

RESULTS: The common age of presentation was defined as 60-80 years based on the histogram. (Figure) Patients with premature PAD were more likely to be female, African American, and Hispanic compared to patients at the common age of presentation. (Table) Patients with premature PAD also had higher rates of insulin-dependent diabetes, smoking, and dialysis, but less severe disease based on TASC classification. These differences in characteristics were more pronounced in patients with CLTI. Logistic regression demonstrated that premature PAD was independently associated with major adverse limb events (MALEs) at one-year for claudication (OR:1.68[1.38-2.04]) and CLTI (OR:1.31[1.13-1.51]) compared to patients 60-80-year-old.

CONCLUSIONS: Patients with premature PAD have significant differences in characteristics compared to patients treated at the common age of presentation. Despite having less severe disease burden, patients with premature PAD have worse one-year MALEs.

Figure.

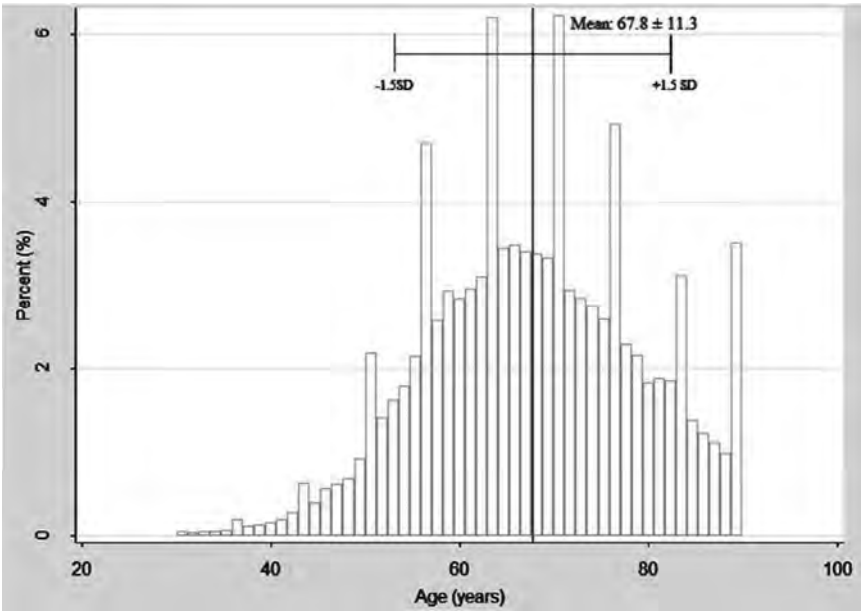


Table. Characteristics and Outcomes of Patients Undergoing Lower Extremity Revascularization

	Premature PAD	**60-80 years of age**	**P value**
	N=8,328	N=81,575	
Demographics, comorbidities, and procedure characteristics			
Female	3,384 (40.63%)	30,629 (37.55%)	<.001
Race			<.001
-White	5,830 (70.06%)	64,127 (78.67%)	
-African American	1,917 (23.04%)	12,764 (15.66%)	
-Other	575 (6.91%)	4,621 (5.67%)	
Insulin-dependent diabetes	2,796 (33.57%)	23,505 (28.81%)	<.001
Smoking status - current	5,104 (61.30%)	29,719 (36.46%)	<.001
Dialysis	971 (11.66%)	6,151 (7.54%)	<.001
Indication			<.001
-Claudication	3,675 (44.13%)	37,678 (46.19%)	
-Rest pain	1,574 (18.90%)	12,582 (15.42%)	
-Tissue loss	3,079 (36.79%)	31,320 (38.39%)	
Type of procedure			<.001
-Endovascular	5,804 (69.77%)	58,747 (72.03%)	
-Infrainguinal bypass	1,566 (18.82%)	14,472 (17.75%)	
-Suprainguinal bypass	720 (8.65%)	3,740 (4.59%)	
-Hybrid procedure	229 (2.75%)	4,596 (5.64%)	
One-year outcomes			
Target lesion revascularization	565/4,350 (12.99%)	3,800/39,293 (9.67%)	<.001
Ipsilateral major amputation	392/4,366 (8.89%)	2,346/39,845 (5.89%)	<.001
Mortality	281 (3.37%)	6,052 (7.42%)	<.001
Major adverse limb events	876/4,279 (20.47%)	5,689/38,780 (14.67%)	<.001

5:36 pm – 5:48 pm

33

Association of Loss of Commercial Insurance and the Risk of Lower Extremity Amputation in Peripheral Artery Disease

Caronae M. Howell[1], Adelina Lane[2], Juan Camilo Arias[1], Craig C. Weinkauf[1], David Armstrong[3], Tze -Woei Tan[1] - [1]Banner UMC, Tucson, AZ; [2]University of Arizona School of Medicine, Tucson, AZ; [3]University of Southern California, Los Angeles, CA

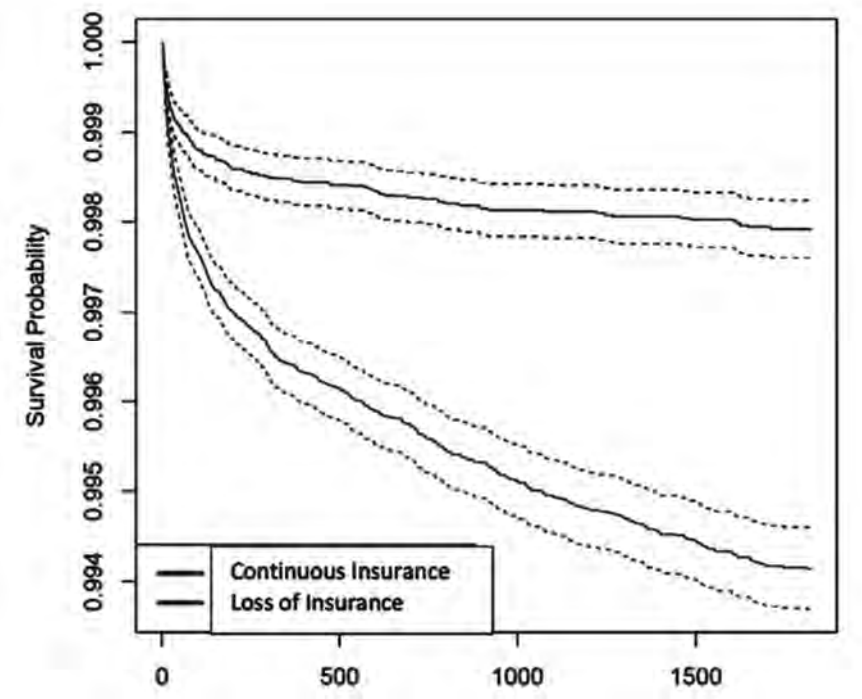
INTRODUCTION: Prior studies have shown a relationship between under/no insurance and increased risk of major and minor amputation in peripheral artery disease (PAD), but there is little data on the risk associated with loss of insurance in a previously insured population. We sought to address this question using insurance claims data.

METHOD: The PearlDiver insurance claims dataset (2010 to 2019) was queried for adult patients (>18 years) with commercial insurance and at least three years continuous enrollment after PAD diagnosis. Patients were categorized into continuous cohort (continue commercial insurance coverage) and loss of insurance cohort (transition to Medicaid or no insurance). Logistic regression was performed for the crude cohort and propensity matched cohort (using age, gender, and Charleston Comorbidity Index) to evaluate association between loss of insurance and risk of major and minor amputation.

RESULTS: We identified N=92,772 patients with continuous commercial insurance during the three-year query period and N=213,097 patients who had interrupted coverage. In the crude cohort, loss of insurance was associated with 77% higher risk of major amputation (95% confidence interval (CI) 1.49-2.12) and 42% higher risk of minor amputation (95% CI 1.31-1.53). Matched cohort showed similar results in a subset of N=91,480 patients, with 233% higher risk of major amputation (95% CI 1.96-2.80) and 203% higher risk of minor amputation (95% CI 1.88-2.21) in the loss of insurance group.

CONCLUSIONS: Loss of commercial insurance is associated with increased risk of major and minor amputations in PAD patients. This may be related to delayed presentation to primary or specialty care, variations in physician willingness to treat uninsured patients, and differences in available treatment options.

Figure. Kaplan-Meier Curve for Risk of Major Amputation



5:48 pm – 6:00 pm

34

High Dose-Rate Brachytherapy for Lower Extremity In-Stent Restenosis: A 18-Year, Single -Center Experience

Rowza T. Rumma[1], Christian D. Cerecedo-Lopez[2], Christine T. Wu[1], Phillip M. Devlin[2], Edwin C. Gravereaux[1], Piotr S. Sobieszczyk[1], Michael T. Belkin[1], Matthew T. Menard[1] - [1]Brigham and Women's Hospital, Boston, MA; [2]Dana Farber Cancer Institute, Boston, MA

INTRODUCTION AND OBJECTIVES: We present our 18-year experience of endovascular brachytherapy (EVBT), which was previously validated as a treatment for in-stent restenosis (ISR).

METHODS: We performed a single-center retrospective analysis of outcomes in 158 patients who underwent PTA and EVBT from 2003 to 2020. A dose of 20Gy was given at a depth of 0.5mm beyond the radius of the largest PTA balloon using iridium-192, with at least 2-cm-long margins of radiation coverage proximal and distal to the injured area. Stents were assessed for patency by duplex ultrasound imaging or angiography at 1, 3, 6, 9, 12, and 18 months and then yearly. The primary endpoint was freedom from 50% restenosis in the treated segment at 1 year, and 2 years. Patency data were estimated using the Kaplan-Meier method. Secondary endpoints were early and late thrombotic occlusion.

RESULTS: Of the 174 consecutive cases of EVBT, 29 (16.7%) were performed in common, external, or internal iliac, 145 (83.3%) in common femoral, superficial femoral, or popliteal arteries, or both. 142 patients (89.9%) had claudication, and 16 (10.1%) had critical limb ischemic symptoms. Preliminary analysis revealed the mean treated length to be 24.1 ± 12.3 cm over a mean duration of 16.5 ± 9.6 minutes. Median post-EVBT follow-up time was 2670 days (range, 1-4154 days). There were six (3.4%) and eighteen (10.3%) cases of early and late thrombotic occlusions, respectively. There were two deaths secondary acute coronary syndrome and stroke. Primary, assisted primary, and secondary patency in the entire cohort was 77.5%, 88.6%, and 90.6%, respectively, at 1 year and 64.8%, 79,2%, and 83.6%, respectively, at 2 years.

CONCLUSIONS: Our validated PTA with adjunctive EVBT protocol, followed by a consistent surveillance strategy, proves to offer a viable treatment option of ISR in centers that have the capacity to collaborate with Radiation Oncology.

Full Program & Abstracts

6:00 pm – 7:00 pm	**VESS MEMBER BUSINESS MEETING**
6:15 pm – 7:30 pm	**INDUSTRY SESSION** Sponsored by: Terumo Aortic

Saturday, January 29, 2022

6:00 am – 7:00 am	Continental Breakfast
6:00 am – 9:30 am	Registration
7:00 am – 9:00 am	**SCIENTIFIC SESSION IV** Moderators: Roan Glocker, MD & Jaime Bennaroch -Gampel, MD
7:00 am – 7:12 am	35 **Surgical Deep Vein Arterialization: Adding to the Armamentarium of Complex Limb Salvage** Alexis L. Lauria[1], Brandon W. Propper[1], Richard F. Neville[2] - [1]Walter Reed National Military Medical Center, Bethesda, MD; [2]Inova Heart and Vascular Institute, Falls Church, VA

INTRODUCTION AND OBJECTIVES: Patients with severe peripheral arterial disease with limited or non-existent arterial runoff, the so-called "desert foot", challenge efforts at limb preservation. Deep vein arterialization (DVA) involves incorporating a venous target as outflow to achieve revascularization in these complex patients. We report outcomes in an initial series of patients undergoing DVA as a component of surgical bypass.

METHODS: Over a 2-year period, 10 patients underwent bypass incorporating DVA due to severely disadvantaged runoff using a heparin-bonded ePTFE conduit. Indications for surgery included tissue loss (8) or ischemic rest pain (2) in patients who had failed prior endovascular (3) or surgical (7) revascularization. Inflow arteries for bypass ranged from external iliac to below knee popliteal. Outflow anastomoses incorporated a common ostium AV fistula between anterior tibial (5), posterior tibial (2), peroneal (1) or plantaris pedis (2) arteries and corresponding tibial veins. Prior to anastomotic completion, tibial vein valves were lysed to allow venous arterialization through retrograde flow. Postoperative medical regimen included dual antiplatelet (2), antiplatelet plus anticoagulation (7), or anticoagulation alone (1).

RESULTS: Primary patency was maintained in 7 of 10 grafts (average of 4.1 months, range 1-18 months). Limb salvage was achieved in 8 of 10 patients (average of 6 months, range 1-18 months). 2 below knee amputations were performed after graft occlusion due to extensive tissue loss and infection, while one patient maintained limb salvage despite graft occlusion after successful wound healing.

CONCLUSIONS: This initial experience describes surgical DVA using a prosthetic conduit in conjunction with an AV fistula at the distal anastomosis in patients with threatened limb loss and severely disadvantaged tibial runoff. Although evidence for long-term efficacy is uncertain, further investigation is warranted as this technique may allow for surgical bypass resulting in limb preservation for patients with no other alternative than amputation.

7:12 am – 7:24 am

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TEVAR with Supra-Aortic Trunk Revascularization is Associated with Increased Risk of Periprocedural Ischemic Stroke

Ruojia Debbie Li, Matthew C. Chia, Mark K. Eskandari - Northwestern University, Chicago, IL

7:24 am – 7:36 am

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Utilization of Thromboelastography with Platelet Mapping for Prediction of Poor Wound Healing and Infection in Postoperative Vascular Patients

Monica Majumdar[1], Davis Waller[1], Srihari Lella[1], Brandon Sumpio[1], Zach M Feldman[1], Young Kim[1], Charles S. Decarlo[1], Jessica Cardenas[2], Ryan P. Hall[3], Kathryn Nuzzolo[1], Amanda Kirshklan[1], Anahita Dua[1] - [1]Massachusetts General Hospital/ Harvard Medical School, Boston, MA; [2]University of Texas-Houston, Houston, TX; [3]Tufts Medical Center/Tufts University School of Medicine, Boston, MA

INTRODUCTION AND OBJECTIVES: Microvascular disease and increased platelet aggregation have been cited as contributing factors to poor wound healing and infection. Thromboelastography with platelet mapping (TEG-PM) provides a measurement of clot strength that factors in medication effects, including individual drug resistance. This may provide insight into patient-specific risk factors and an opportunity to prevent wound infections/ dehiscence. This prospective, observational study aimed to determine if TEG-PM could identify patients more likely to experience postoperative wound infections/dehiscence following extremity revascularization.

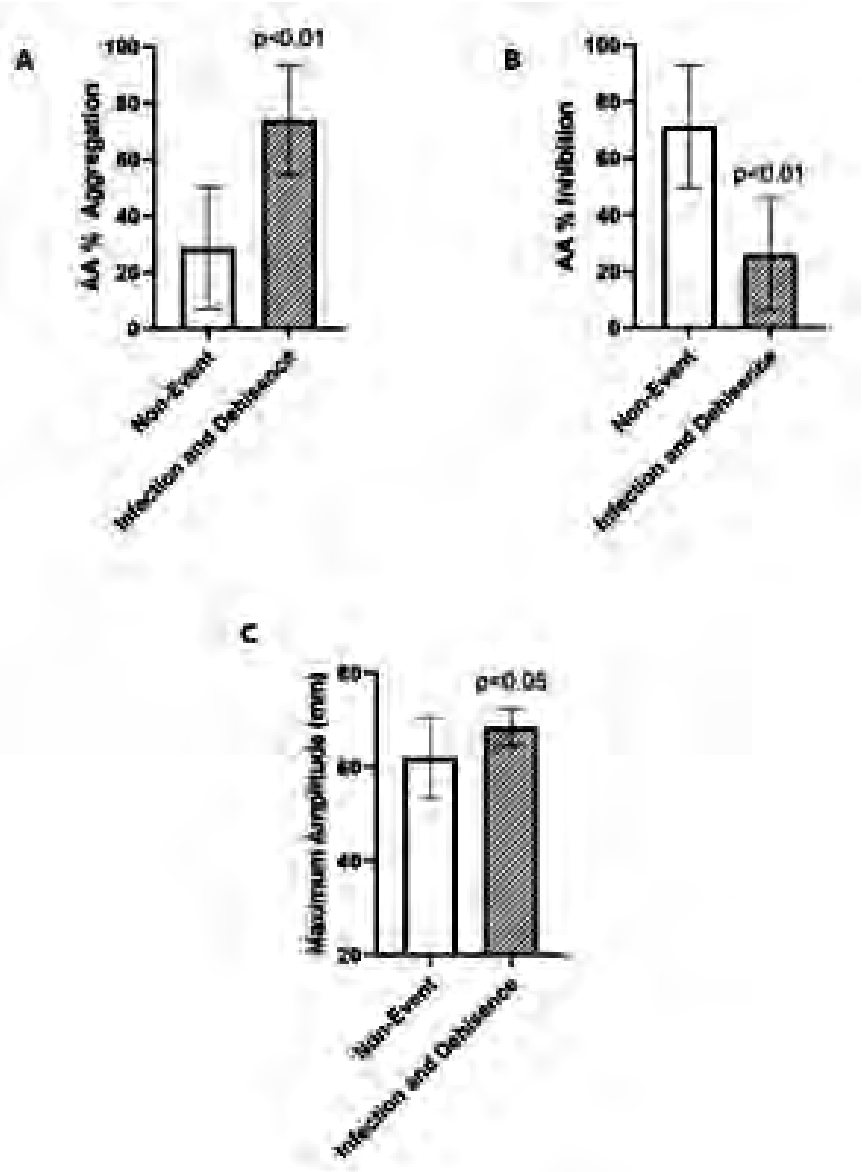
METHODS: All patients undergoing named vessel revascularization during December 2020-August 2021 at a large tertiary institution were prospectively included. TEG-PM assays were performed on patients immediately pre-operatively and at serial intervals postoperatively up to six months.

RESULTS: Fifty-six patients met enrollment criteria and were included in analysis. Seven (12.5%) patients experienced a new postoperative infection or wound dehiscence requiring reintervention. Platelet aggregation percent was significantly higher in the infection/dehiscence group as compared to the nonevent group, [74.0%±19.6 vs. 28.5%±21.6, $p<0.01$] (Figure 1A). The percent of platelet inhibition was significantly lower in the infection/ dehiscence group as compared to the nonevent group, [26.0%±19.6 vs. 71.2% ±21.8, $p< 0.01$] (Figure 1A). Maximum amplitude of clot (MA) was significantly higher in the infection/dehiscence group as compared to the nonevent group [68.5mm±3.9 vs. 62.0mm±8.5, $p<0.05$] (Figure 1B). Other TEG values reflecting time to clot formation/breakdown did not differ significantly.

CONCLUSIONS: TEG-PM revealed a significantly higher level of platelet aggregation and clot strength (MA) with diminished platelet inhibition in patients with infection/dehiscence events following revascularization procedures, indicating that their microvascular flow may be compromised. This novel insight may expose an integral factor for at-risk patients and provide an opportunity for individualized intervention following revascularization.

Full Program & Abstracts

Figures.



7:36 am – 7:48 am

38

"Large Diameter" Aortic Endografts are Associated with Aneurysm Sac Expansion

Patricia Lu[1], Young Erben[2], Randall DeMartino[3], Bernardo Mendes[3], William Stone[1], Victor Davila[1], Ina Soh[1], William Sheaffer[1], Austin Pierce[1], Andrew Meltzer[1] - [1]Mayo Clinic, Phoenix, AZ; [2]Mayo Clinic, Jacksonville, FL; [3]Mayo Clinic, Rochester, MN

INTRODUCTION AND OBJECTIVES: This study's purpose was to evaluate the association between aortic endograft diameter and long-term outcomes following endovascular aneurysm repair (EVAR) performed in accordance with manufacturer instructions for use (IFU).

METHODS: Retrospective review of consecutive patients undergoing on-IFU EVAR (2000-2018) was performed to compare long-term patient outcomes based on device diameter. "Large diameter" devices were defined as >34mm. The primary outcome was freedom from sac expansion throughout long-term follow-up. Analyses included bivariate analyses, Kaplan Meier with log-rank comparison, and multivariate Cox regression.

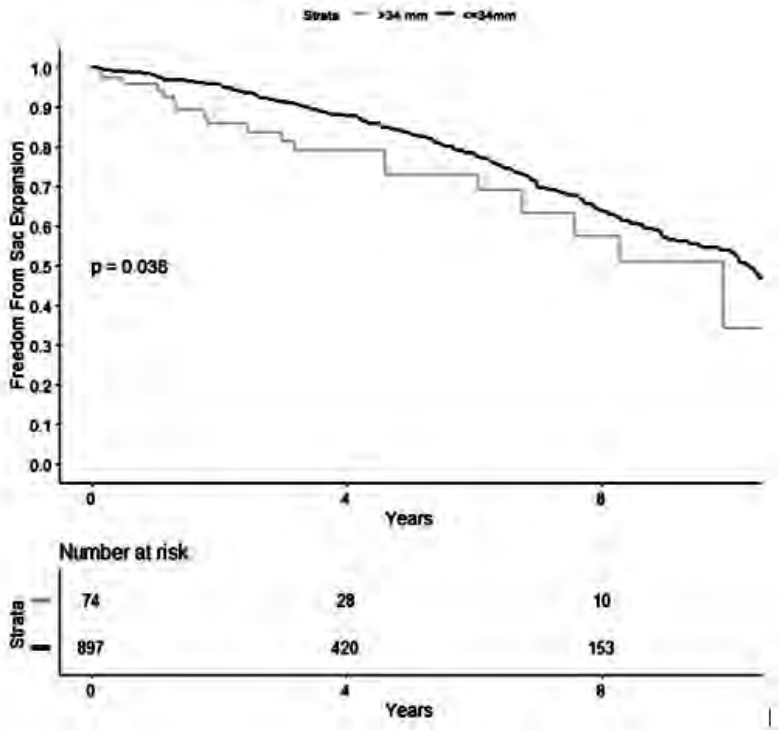
RESULTS: A total of 1099 patients underwent on-IFU EVAR from 2000-2018. Follow-up data were available for 980 patients. Of these, 75 (7.6%) were treated with >34 mm devices. There were no significant differences in demographics or co-morbidities between the two groups, although pre-operative AAA size was greater in the large diameter group (58 ± 8.5 mm vs. 56 ± 17.4 mm; p=0.05). Median follow-up was 10.3 years. Patients with grafts >34 mm had decreased freedom from sac expansion (p=0.038) (Figure). Multivariate Cox regression identified independent factors associated with sac expansion, including age, pre-operative AAA size, reinterventions, and >34 mm endografts (Table).

CONCLUSION: Large diameter aortic endografts are associated with higher rates of sac expansion during long-term follow-up. While there is a role for large diameter grafts in select patients, it is important to recognize that these devices were often approved *post-hoc* without the same regulatory scrutiny of smaller endografts. These findings underscore the importance of surveillance for patients treated with >34 mm grafts.

Table. Multivariate Analysis

	Hazard Ratio	95% CI		P Value
Graft >34 mm	1.79	1.12	2.80	0.0147 *
AAA Diameter (mm)	1.01	1.01	1.02	0.0012 **
Reintervention	3.18	2.42	4.17	< .001***
Female	0.93	0.60	1.43	0.7318
COPD	1.03	0.69	1.53	0.8929
HTN	0.82	0.59	1.15	0.2575
Age (per year)	1.06	1.04	1.08	< .001***

Figure. Kaplan-Meier Estimates



7:48 am – 7:56 am

39 (RF)

Impact of "Defensive Medicine" on the Costs of Diabetes and Associated Conditions

Austin Pierce[1], William Sheaffer[1], Victor Davila[1], Ina Soh[1], Ellen Meltzer[1], Francesco Aiello[2], Andrew Meltzer[1] - [1]Mayo Clinic Arizona, Phoenix, AZ; [2]University of Massachusetts Memorial Health, Northborough, MA

OBJECTIVES: This study explores the association between the medicolegal environment and Medicare costs for Diabetes and associated conditions of interest to vascular surgeons.

METHODS: The 2018 Medicare Geographic Variation Public Use Files and Chronic Conditions Data Files were linked to National Practitioner Database files from the preceding 5 years, in addition to US Census data and AMA workforce statistics. State-level medicolegal environment was characterized by K-means clustering across a panel of metrics related to malpractice payment magnitude and prevalence.

RESULTS: Median (IQR) unadjusted Medicare per-capita expenditure on diabetic patients was $15,963 ($14,885 to $17,673), ranging from $13,762 (Iowa) to $21,865 (D.C.). Cluster analysis based on malpractice-related variables yields 5 distinct medicolegal environments. Per-capita spending on diabetes ranged from $15,799 in medicolegally favorable states to $18,838 in more adverse medicolegal environments. Malpractice claim prevalence was an independent predictor of states with the highest DM spending [Table1]. Diabetic patients in states with adverse medicolegal environments had more procedures, imaging tests, and readmissions ($p<0.05$). By multivariate analysis, amputation rates were associated with cost, co-morbidity prevalence, and race, but not medicolegal factors.

CONCLUSION: An adverse medicolegal environment is independently associated with higher healthcare costs but not improved outcomes (i.e. amputation rate) for diabetics. A 1% increase in lawsuits was associated with a >10% increase in per-capita costs. This demonstrates the potential contribution of "defensive medicine" to variation in healthcare spending in a population of interest to vascular surgeons.

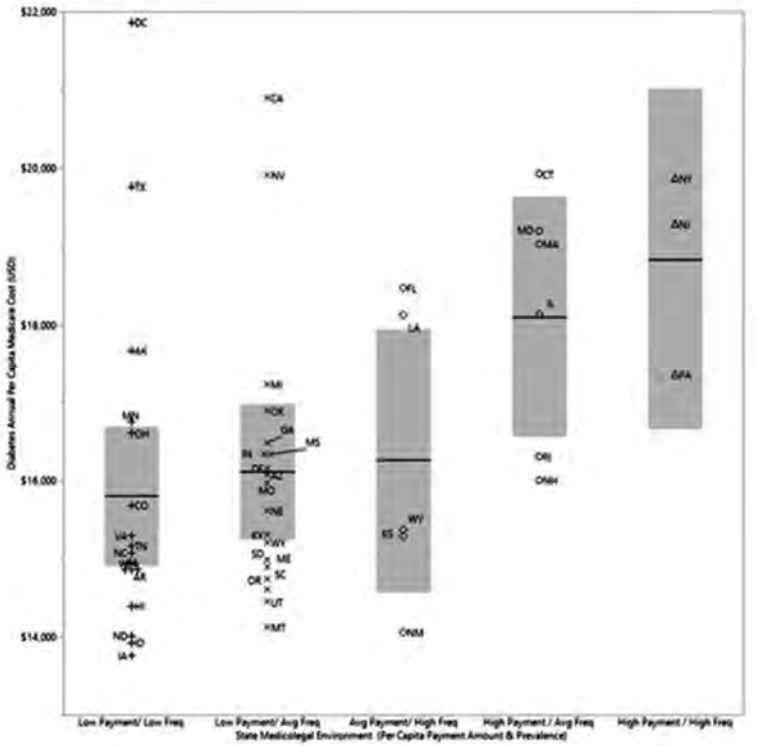
Table. Multiple Linear Regression Model Predicting Per Capita Spending on Diabetes Mellitus

Variable	Estimate	Standard Error	95% CI	p-value
Average HCC Score (per 0.01)	$221.06	$33.99	$152.41 – 289.70	<0.0001
Percent African American	$6,426.75	$2,294.31	$1,792.69 – $11,060.80	0.008
Annual Claims/ 100 Physicians	$1,824.88	$765.47	$278.99 – 3,370.77	0.022
Percent Hispanic	$6,298.34	$3,266.01	$-297.49 – 12,894.18	0.061
Annual Claims per 1M residents	$(59.30)	$36.99	$-134.01 – 15.41	0.117
Percent Eligible for Medicaid	$(4,014.20)	$3,408.88	$-10,898.67 – 2,870.08	0.246
Percent Female	$(18,225.62)	$17,247.20	$-53,057.04 – 16,605.81	0.297
Age	$(241.35)	$277.92	$-100.89 – 319.92	0.390
Per Capita Malpractice Costs	$12.20	$56.00	$-100.89 – 125.29	0.829

$R^2 = 0.76; p < 0.0001$

Full Program & Abstracts

Figure. Diabetes Annual Per Capita Medicare Cost Cluster Analysis



7:56 am – 8:04 am

40 (RF)

Longer Healing Times, Higher Recurrence Rates, and Increased Incidence of DVT Following Cyanoacrylate Ablation for Active Venous Ulcerations

Lindsey Korepta, Matthew Ward - Loyola University Medical Center, Maywood, IL

INTRODUCTION: Venous leg ulcerations are a common ailment with increasing prevalence in older populations, 5% of those over age 65, and cost approximately half a billion dollars per year. With an aging population, venous ulcers represent an increasing burden. Treatment of superficial venous reflux with ablation has been demonstrated to decrease ulcer recurrence, but the relationship between healing active ulcers and ablation remains uncertain, particularly between different modalities of ablation.

METHODS: Data was collected retrospectively on 146 patients at a single institution, tertiary-referral center, with an active venous ulcer who underwent ablation therapy via cyanoacrylate (Venaseal™), radiofrequency (RFA), or endovenous laser ablation (EVLT) from 2010-2020. The primary outcome was the time to ulcer healing. Secondary outcomes were the rate of recurrence, compliance with compression, and participation in a wound clinic.

RESULTS: The study showed a non-significant difference in days to ulcer healing post-intervention between ablative techniques, with 80.8 days for cyanoacrylate (n=15), 70.07 for RFA (n=44), and 67.04 days for EVLT (n=79). A similar, non-significant trend was observed for ulcer recurrence, with a rate of 35.7% (5/14) for cyanoacrylate, 26.7% (20/75) for EVLT, and 23.1% (9/39) for RFA. Few local and systemic complications occurred. The most common complication was DVT after procedure (n=13). The same non-significant trend occurred with DVT following procedure, being observed in 12.5% (2/16) of cyanoacrylate, 9.5% (8/84) of EVLT, and 6.5% (3/46) of RFA cases. Logistic regression to predict wound healing was significant for compliance with compression therapy and was not influenced by smoking, diabetes mellitus, or participation in a wound clinic.

CONCLUSIONS: There is a consistent trend towards longer rates of healing, higher ulcer recurrence, and increased incidence of DVT after cyanoacrylate ablation as compared to RFA and EVLT. Compliance with compression therapy is predictive of ulcer healing for all ablation modalities.

8:04 am – 8:12 am

41 (RF)

Clinical Outcomes and Management of Patients Presenting with Intermittent Claudication and a Low Toe Brachial Index

Drew Bromenshenkel, Alyssa Field, Lori Pounds, Clay Quint - Audie L. Murphy Memorial VA Hospital, San Antonio, TX

INTRODUCTION AND OBJECTIVES: This study was performed to determine the natural history and outcomes after intervention of patients that presented with symptoms of claudication and a low toe brachial index (< 0.6).

METHODS: This was a retrospective single center study at a VA hospital. Patient charts were reviewed for claudication and TBI<0.6 from 4/2015 to 12/2015 and followed over 5 years. Patient demographics and clinical outcomes were collected.

RESULTS: Forty patients were followed with a total of 78 limbs (limbs presenting with rest pain or wounds were excluded) for a mean of 54.9 months. Demographic results for patients were 26 (65%) DM, 40 (100%) HTN, 40 (100%) HLD, 7 (17.5%) ESRD, 12 (30%) remote-smoker, and 14 (35%) current-smoker. Over the 5-years, 48 (61.5%) limbs remained stable without intervention or amputations. The number of limbs that received intervention without an ulcer or gangrene was 14 (17.9%), and the average time to vascular intervention was 6.7 months. The number of limbs that developed an ulcer or gangrene was 16 (20.5 %), and the average time to ulcer or gangrene was 13.7 months. The number of limbs that had an early major amputation was 11 (14.1%). Of the 19 limbs that underwent initial vascular intervention, 68.4% had an endovascular procedure and 31.6% had an open surgical revascularization. Of the limbs that had an initial endovascular, 3 (23.1%) had multiple endovascular interventions and 3 (23.1%) progressed to open surgical intervention. The survival rate of patients over 5 years with stable limbs was 63.2% and with unstable limbs was 47.6%

CONCLUSIONS: Patients presenting with intermittent claudication and TBI<0.6 are a high-risk subgroup to develop an ulcer or gangrene within 14 months. Therefore, these patients should have aggressive optimal medical management with close follow-up and a low threshold for early vascular intervention to prevent limb loss.

Full Program & Abstracts

8:15 am – 9:00 am

AWARD SESSION
Moderators: Benjamin Brooke, MD & Jason Lee, MD

Update from 2020 Winners
- Travel Award: Gregory Magee (Postponed)
- Resident Research Award: Christopher Audu

Update from 2021 Winners
- Travel Award: Tze-Woei Tan
- Resident Research Award: Kenneth Tran
- Early Career Faculty: Tammy Nguyen

2022 Award Winners Announcement
- Travel Award
- Resident Research Award
- Early Career Faculty Award

9:00 am – 9:15 am

INTRODUCTION OF THE PRESIDENT
Ravi Veeraswamy, MD

9:15 am – 10:00 am

PRESIDENTIAL ADDRESS
Jason Lee, MD

10:30 am – 11:30 pm

INTERESTING CASE REPORT SESSION 2
Moderator: Manuel Garcia-Toca, MD

CR7 (Video)
A Case of Congenital Absence of the Inferior Vena Cava and Deep Vein Thrombosis
Matt Low - Prisma Health Upstate, Greenville, SC

CR8
Clinical Application of Surgeon-Modified Double Inner Branched Stent Graft to Treat Aortic Arch Aneurysm
William J. Yoon[1], Ian Stines[2], Cheong J. Lee[1] - [1]NorthShore University HealthSystem, Skokie, IL; [2]University of Chicago Pritzker School of Medicine, Chicago, IL

CR9 (Video)
Innominate Artery Aneurysm Repair with Arch Debranching
Ross G. McFall, Maham Rahimi, Thomas MacGillivray - Houston Methodist Hospital, Houston, TX

Full Program & Abstracts

CR10
Revascularization of Absent Right Common Iliac Artery in a Young Athlete
Michael J. Paisley, Joshua Villarreal, Hanjay Wang, Jason T. Lee - Stanford University, Palo Alto, CA

CR11 (Video)
Endovascular Treatment of Severely Stenotic Homograft in a Congenital Truncus Arteriosus Patient
Tru Dang, Agenor Dias, John Rhodes, Ravikumar Veeraswamy - Medical University of South Carolina, Charleston, SC

1:00 pm – 2:00 pm **ASK THE EXPERTS SESSION**
Managing Complex Cases in Hemodialysis
Moderator: Brent Safran, MD

2:00 pm – 2:30pm **INDUSTRY SESSION**
Sponsored by: Convatec

3:00 pm Registration Re-Opens

3:00 pm – 4:00 pm Coffee/Snacks

Full Program & Abstracts

4:00 pm – 6:00 pm **SCIENTIFIC SESSION V**
Moderators: Misty Humphries, MD & Kelly Kempe, MD

4:00 pm – 4:12 pm 42
Preoperative Spinal Drain Placement is Associated with Reduced Risk of Spinal Cord Ischemia in Patients Undergoing Thoracic Endovascular Aortic Repair for Aortic Dissection
Sina Zarrintan, Kevin S. Yei, Munir P. Moacdieh, Mahmoud B. Malas - University of California, San Diego, La Jolla, CA

INTRODUCTION: Spinal cord ischemia (SCI) is a rare but serious complication of TEVAR. A number of measures including spinal drain (SD) placement have been proposed to reduce the risk of SCI in TEVARs performed for aneurysms. However, there is no specific data on potential benefits of SD placement in aortic dissection (AD). We aimed to assess the impact of preoperative SD placement on preventing SCI during TEVARs performed for AD.

METHODS: We included all TEVAR cases performed for AD in VQI from 2012 to 2021. Patients with connective tissue disease, open conversion, rupture, proximal disease > zone 5, or SCI on presentation were excluded. One -to-one propensity score matching was used to balance patients on 37 dimensions by the nearest neighbor principle to compare patients based on preoperative SD placement. The primary outcome was SCI. Secondary outcomes included 30-day and 90-day mortality, perioperative complications, and 90-day re-intervention.

RESULTS: A total of 2970 TEVARs were performed for AD with 1373 (44.9%) undergoing preoperative SD placement. Propensity matching produced 924 well-matched pairs. In the matched cohort, SD placement was not associated with significant reduction in temporary SCI (2.7 vs. 1.9%, p=0.28). However, SD placement was associated with significant reduction of the risk of permanent SCI at discharge (1.4% vs. 2.7%, p=0.049). SD was also associated with lower risk of 30-day mortality (3.6% vs 6.0%, p=0.016) and longer length of stay but not perioperative complication or 90-day mortality or 90-day re-intervention.

CONCLUSION: Our study suggests that preoperative SD placement in patients undergoing TEVAR for AD is beneficial in reducing the risk of permanent SCI without increasing risks of perioperative complications. Further prospective studies are necessary to confirm these findings.

4:12 pm – 4:24 pm

43

Safety and Efficacy of Drug-Eluting Stents for Treatment of Transplant Renal Artery Stenosis

Heepeel Chang[1], Bruce E. Gelb[2], Zoe A. Stewart[2], Bonnie E. Lonze[2], Karan Garg[2], Caron B. Rockman[2], Glenn R. Jacobowitz[2], Nicole M. Ali[2], Neal S. Cayne[2] - [1]Westchester Medical Center, New York Medical College, Valhalla, NY; [2]New York University Langone Medical Center, New York, NY

INTRODUCTION AND OBJECTIVES: There is a paucity of clinical data on use of drug-eluting stent (DES) for transplant renal artery stenosis (TRAS). Therefore, we investigated outcomes of patients with clinically significant TRAS undergoing DES placement.

METHODS: A retrospective review of patients with clinically significant TRAS undergoing percutaneous balloon angioplasty with DES from 2014 to 2021 was conducted. Patient demographics, procedural details, and follow-up outcomes were collected. Primary endpoints were the in-stent primary patency and graft survival. Secondary endpoints were freedom from reintervention and primary-assisted patency.

RESULTS: Thirteen TRAS in twelve patients with graft function alteration were treated with DES. The median age was 57 years (interquartile range (IQR), 48-63), and nine (75%) were male. The median follow-up was 9 months (IQR, 4-52). The median time from transplant to intervention was 5.8 months. TRAS was most commonly found at the proximal portion (92%). The procedure was performed with carbon dioxide angiography with minimal amount of contrast (median, 3 mL) under local and general anesthesia in nine (69%) and four (21%) TRAS, respectively. The rates of stenosis-free primary patency of the DES and graft survival were 75% and 100%, respectively. Three reinterventions for restenosis resulted from the kinking of the transplant renal artery proximal to the DES, which were treated by extending the stent more proximally into the origin of the transplant renal artery. The median time to reintervention was 0.9 months (range, 0.23-2 months). Freedom from reintervention and primary-assisted patency were 75% and 100%, respectively.

CONCLUSIONS: Despite the lack of evidence in literature, these data demonstrate that DES is safe and effective in treating patients with TRAS at short to midterm. As all reinterventions after DES were performed due to kinking of the transplant renal artery proximal to the stent, bridging of the DES into the external iliac artery is recommended.

4:24 pm – 4:36 pm

44

Delirium Associated Adverse Events and Resource Use after Infrainguinal Lower Extremity Bypass

Richard D. Gutierrez[1], Zachary A. Matthay[1], Eric J.T. Smith[1], Kurt Linderman[2], Warren J. Gasper[1], Jade S. Hiramoto[1], Michael S. Conte[1], James C. Iannuzzi[1] - [1]University of California, San Francisco, San Francisco, CA; [2]University of Utah, School of Medicine, Salt Lake City, UT

INTRODUCTION AND OBJECTIVES: Delirium is common yet often underdiagnosed following vascular surgery. Infrainguinal bypass surgery patients are at particular risk for delirium, yet delirium's burden on other perioperative outcomes and resource utilization remains unclear. This study's objective was to identify delirium predictors and associated resource utilization.

METHODS: This single center retrospective analysis included all infrainguinal bypass cases from 2012-2020. The primary outcome was delirium development and severity. Secondary outcomes included length of stay, non-home discharge, readmission at 30 and 90 days, and survival. Regression analysis evaluated delirium risk factors and delirium's association with 2-year survival.

RESULTS: Overall, 420 patients underwent infrainguinal bypass of whom 115 (26%) developed postoperative delirium. Individuals with delirium were older, more likely to be women and have non-elective surgery (all $P<0.05$). On multivariable analysis, independent delirium predictors included age, CLTI, and non-elective procedure (Table 1). Consultations were performed in 25 cases (23%), 13 (52%) being to pharmacists, and only 4 (16%) resulted in recommendations. The average length of stay for the delirium group was higher (17 days vs. 9 days; $P<.001$). Delirium was associated with increased non-home discharge (61.8% vs. 22.1%; $P<.001$) and 90-day mortality (7.6% vs. 2.9%; $P=.033$). Survival at 2 years was lower in those with delirium (89% vs. 75%; $P<.001$). On cox multivariable analysis over 2 years, delirium was independently associated with poor survival (HR=2.0; 95% CI=1.15-3.38; $P=0.014$).

CONCLUSIONS: Delirium is associated with adverse post-operative outcomes and increased resource utilization, including increased hospital length of stay, non-home discharge, and 2-year mortality. Future studies should evaluate the role of routine multidisciplinary care for high-risk patients to improve perioperative outcomes for vulnerable older adults undergoing lower extremity infrainguinal bypass.

Table. Binary Logistic Regression for Postoperative Delirium

Variable	Odds Ratio	P-value	95% CI
Non-elective procedure	2.09	0.003	1.28-3.39
Age	1.06	<0.001	1.03-1.08
CLTI	1.74	0.04	1.03-2.96
Preoperative Dementia Diagnosis	2.61	0.075	0.91-7.49
C-Statistic = 0.73			

4:36 pm – 4:48 pm

45

One-Year Outcomes after Implementation of a Ruptured Abdominal Aortic Aneurysm Protocol

Amanda R. Phillips[1], Jaineet S. Chhabra[2], Paige Phillips[1], Mohammad H. Eslami[1], Rabih Chaer[1], Michel S. Makaroun[1], Michael J. Singh[1], Nathan L. Liang[1] - [1]UPMC, Pittsburgh, PA; [2]Marshall University Medical School, Huntington, WV

OBJECTIVE: Societal guidelines recommend protocol establishment for patients with ruptured abdominal aortic aneurysms (rAAA), but few reports exist. We describe 1-year outcomes after implementing a rAAA protocol and a survey of team member perceptions.

METHODS: This was a multi-hospital single healthcare network pre-post investigation (2017-2020) where a single quaternary university hospital (QUH) receives rAAA transfers. Protocol activation engages a multidisciplinary team including vascular surgery, anesthesia, operating room (OR) and emergency department (ED) staff, and was implemented in Feb 2020. Patients are routed from the helipad to the OR or ED for expedited management. Primary outcomes were time from QUH arrival to OR and 30-day mortality. Post-protocol outcomes were compared to historical controls (2017-2019). As a qualitative adjunct, we conducted a survey examining perceptions among participants at 1-year post implementation.

RESULTS: 88 patients with rAAA presented during our study period (42 pre; 46 post). Protocol activation occurred in 32 (70%) of post-protocol patients. Presenting characteristics were similar between groups (Table 1). QUH arrival time to OR was lower for the post protocol cohort compared to historical controls (pre 88.9±78.5; post 24.6±28.4 minutes; $p<0.01$). 30-day mortality did not differ significantly between groups (pre N=17(40%); post N=13(41%); P=.8). Most survey participants believed the protocol improved safety (65%) and care efficiency (63%). Almost all (89%) would want the protocol activated for a family member (Table 2).

CONCLUSIONS: rAAA protocol implementation reduced OR arrival time and improved patient safety and efficiency perspectives among staff. Protocol development should be considered at centers with high volumes of rAAA.

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Table 1. Demographics, Clinical Characteristics and Preoperative Details

	Pre-Protocol Group N=42	Post-Protocol Group N=32	P
Male sex	26 (62%)	18 (56%)	.64
Age	74.4 ± 8.2	74.7 ± 10.1	.94
CAD	17 (40%)	1 (3%)	< .001
COPD	13 (31%)	5 (16%)	.17
HTN	29 (69%)	12 (38%)	.015
CPR	4 (10%)	2 (6%)	1
EVAR	18 (43%)	11 (34%)	.61
Lactate $\geq$ 3	17 (40%)	15 (47%)	.37

Table 2. Perceptions of Code Rupture from Involved Groups 1 Year after Implementation

	Vascular Surgery	**Anesthesia**	**OR Staff**	**ED Staff**	**Total**
% Responded (N responded/total surveyed)	62.2% (23/37)	20.1% (55/266)	27% (54/200)	29% (18/62)	26.6% (150/565)

Since its implementation in February 2020, to what degree do you think Code Rupture has impacted patient safety for patients with ruptured AAA at Presbyterian hospital?

Significantly improved	18.9% (4)	5.7% (3)	15.4% (8)	29.4% (5)	13.9% (20)
Moderately improved	59.1% (13)	34% (18)	25% (13)	11.8% (2)	31.9% (46)
Minimally improved	13.6% (3)	20.8% (11)	23.1% (12)	11.8% (2)	19.4% (28)
It has not improved	0% (0)	1.9% (1)	0% (0)	11.8% (2)	2.1% (3)
I am unsure	9.1% (2)	37.7% (20)	36.5% (19)	35.3% (6)	32.6% (47)

How has Code Rupture impacted the overall efficiency of the immediate care surrounding ruptured AAAs?

Significantly improved	13.6% (3)	6.8% (3)	18.4% (9)	20% (3)	13.9% (18)
Moderately improved	77.3% (17)	52.3% (23)	38.8% (19)	33.3% (5)	49.2% (64)
No improvement	0% (0)	6.8% (3)	6.1% (3)	13.3% (2)	6.2% (8)
The protocol had reduced efficiency	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
I am unsure	9.1% (2)	34.1% (15)	36.7% (18)	33.3% (5)	30.8% (40)

Would you want Code Rupture activated if your own family member or person you cared about had a ruptured AAA and were being transported to the hospital?

	Vascular Surgery	**Anesthesia**	**OR Staff**	**ED Staff**	**Total**
Yes	100% (22)	79.6% (35)	93.9% (46)	80% (12)	88.5%
No	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
I am unsure	0% (0)	20.5% (9)	6.1% (3)	20% (3)	11.5%

4:48 pm – 4:56 pm

46 (RF)

Effective Neck for Endovascular Treatment of Blunt Traumatic Aortic Injury

Tommaso Cambiaghi[1], Ezra Y. Koh[2], Rana O. Afifi[1], Gustavo S. Oderich[1] - [1]McGovern Medical School @ UTHealth, Houston, TX; [2]Houston Methodist Hospital, Houston, TX

INTRODUCTION AND OBJECTIVES: To identify the proximal neck required for endovascular treatment of blunt traumatic aortic injuries involving the proximal descending thoracic aorta.

METHODS: The pre-operative and post-operative contrast-enhanced CT scans of patients treated at a single level 1 trauma center between 2005 and 2021 were retrospectively analyzed with Terarecon Aquarius iNtuition software. The distance between the left subclavian artery and the aortic injury was measured at the admission studies and the distance between the LSA and the covered portion of the aortic endograft was measured at follow-up CT scans utilizing straightened centerline reconstructions. Follow-up imaging was also reviewed for presence of endoleak or complications related to the index procedure. Patients treated with Gore TAG Thoracic Branch Endoprosthesis were excluded from the analysis.

RESULTS: Out of 209 TEVARs performed between September 2005 and January 2021, 54 consecutive patient charts were reviewed, 3 patients were treated with Gore TAG TBE and 16 did not have post-operative CT scans. Median follow-up CT timing was 44 days (IQR 9.5 - 92). Of the 35 patients analyzed, 4 TEVARS were intentionally deployed in zone 2, the remaining grafts were implanted in zone 3 or lower. The median sealing zone was 8mm (IQR 4mm - 13mm). No endoleak was visible at follow-up CT, and only one left subclavian artery occlusion was found in the zone 3 TEVAR sub-group despite lack of LSA ostium coverage at index procedure and follow-up imaging.

CONCLUSIONS: This retrospective study demonstrates that a short proximal neck is both effective and safe for endovascular treatment of blunt traumatic aortic injuries. These findings can assist in determining the appropriate graft landing zone, avoiding the unnecessary coverage of the left subclavian artery necessary when trying to achieve a neck comparable to that required for atherosclerotic thoracic aortic aneurysms.

4:56 pm – 5:04 pm

47 (RF)

Impact of Preoperative Beta-Blockade on Outcomes Following the Surgical Treatment of Atherosclerotic Disease

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

INTRODUCTION AND OBJECTIVES: Beta-blockers are integral to the treatment of many cardiovascular diseases however studies of their potential perioperative benefit remain mixed in their findings. The objective of this study was to determine the impact of preoperative beta-blockade in patients undergoing vascular surgery to treat atherosclerotic disease (carotid endarterectomies and supra- and infra-inguinal bypasses).

METHODS: The National Surgical Quality Improvement Program (NSQIP) targeted datasets were queried for patients undergoing carotid endarterectomies and supra- and infra-inguinal bypasses between 2011-2019. Rates of major adverse cardiovascular events (MACE) including myocardial infarction (MI), stroke and death were compared between patients with and without preoperative beta-blockade (BB). Multivariable logistic regression models were created to adjust for differences in baseline characteristics between groups.

RESULTS: Of the 84,331 patients included, 56% received BB. Beta-blocker use has decreased from 59.7% in 2011 to 53.9% in 2019 ($p<.001$). Patients receiving BB were more likely to have diabetes (45% vs. 32%, $p<0.001$), heart failure (4% vs. 1%, $p<0.001$), or be on an anti-hypertensive medication (93% vs. 69%, $p<0.001$). Unadjusted rates of death (1.5% vs. 0.96%, $p<0.001$) and MACE (4.2% vs. 2.7%, $p<0.001$) were higher in the BB group. After adjusting for differences in baseline characteristics, BB was associated with an increased risk of MACE (OR=1.24, 95%CI=1.14-1.34). On subgroup analysis, BB was associated with increased risk of MACE following carotid endarterectomy (OR=1.31, 95% CI=1.15-1.49), infra-inguinal bypass (OR 1.191, 95% CI=1.05 -1.34), and supra-inguinal bypass (OR 1.252, 95% CI=1.035-1.514). BB was associated with increased risk of MACE following open procedures (OR=1.29, 95% CI=1.17-1.41), but not endovascular procedures.

CONCLUSIONS: Preoperative beta-blockade is associated with an increased risk of MACE following common vascular surgery procedures, even after controlling for baseline health status, which affects over half of patients undergoing surgical treatment of atherosclerotic disease. Risk of MACE in patients receiving beta-blocker therapy may be lessened by endovascular approach.

5:04 pm – 5:12 pm

48 (RF)

Integrated Vascular Surgery Versus General Surgery Residency Programs: A Ten-Year Comparison Using a Normalized Competitive Index

John A. Treffalls, Rebecca N. Treffalls, Qi Yan, Mark G. Davies - University of Texas Health San Antonio, San Antonio, TX

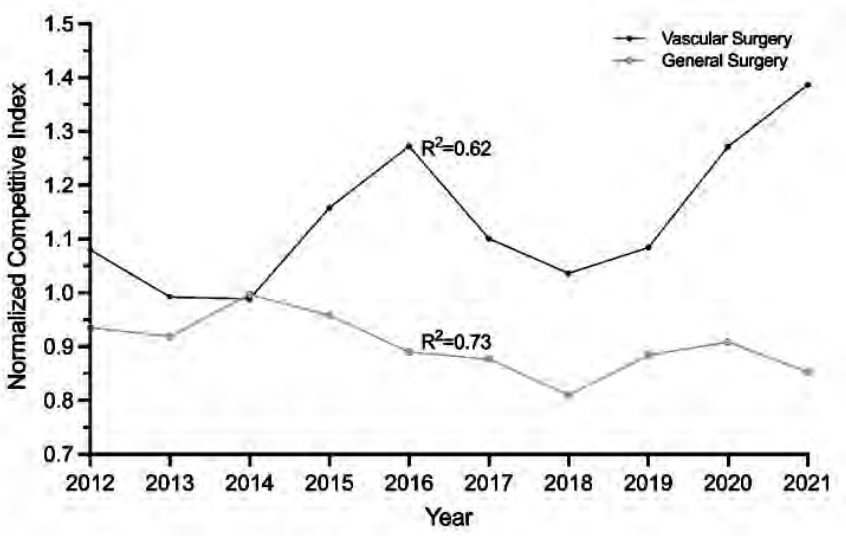
INTRODUCTION AND OBJECTIVES: Integrated vascular surgery residency (0+5) programs have increased in popularity and offer an accelerated track compared to the traditional fellowship pathway. We sought to create a simple metric for medical students to better assess the competitiveness of 0+5 training programs compared to general surgery (GS) programs.

METHODS: GS and 0+5 programs were compared using National Resident Matching Program match data from 2011-2021. Applicant metrics (board scores, research output and experiences, work experiences, and volunteer experiences) from 2015-2019 were obtained using the Association of American Medical Colleges Report on Residents. A normalized competitive index (NCI) was created (number of programs ranked per applicant divided by match rate) for each specialty and normalized to a value of 1 to improve longitudinal comparisons. NCI and number ranked per applicant were plotted across time and a linear regression was performed to evaluate a ten-year trend.

RESULTS: The match rate of both specialties was 62% and was similar for GS and 0+5 programs. The number of programs ranked per applicant was higher in 0+5 compared to GS (9.36 vs. 7.66, $P<0.001$). NCI was higher for 0+5 compared to GS (1.14 vs. 0.903, $P<0.001$). Applicant metrics were similar between groups except for research output, which was higher in 0+5 applicants (6.2 vs. 3.8, $P=0.034$). The linear regression revealed increasing NCI and number ranked per applicant across time for 0+5 programs compared to GS with all $R^2>0.61$ ($P<0.001$).

CONCLUSIONS: Matching in vascular 0+5 programs is increasingly competitive. The NCI was approximately 25% higher for 0+5 programs compared to GS programs despite similar match rates. As 0+5 programs continues to evolve, NCI may be a more useful metric for applicants.

Figure. NCI Trends Over Time



5:12 pm – 5:24 pm

49

Perioperative Outcomes among Major Endovascular Stent Grafts for the Treatment of Abdominal Aortic Aneurysm

Emma Goldsmith Rooney, Anna Beth West, Caroline Wasserman, Ravi R. Rajani, Christopher R. Ramos, Jaime Bennaroch-Gampel - Emory University School of Medicine, Atlanta, GA

INTRODUCTION: There are currently six endovascular stent grafts approved by the Food and Drug Administration for the endovascular repair (EVAR) of infra-renal abdominal aortic aneurysms (AAA). There is minimal data comparing the outcomes between devices.

METHODS: The National Surgical Quality Improvement Program (NSQIP) targeted database was queried for patients undergoing EVAR between 2011-2019. Devices used in at least 10% of patients were included (Cook Zenith, Gore Excluder, and Medtronic Endurant). Patient demographics, procedure details, 30-day EVAR specific complications and mortality were compared between devices. Multivariable logistic regression models were used to predict outcomes while adjusting for baseline differences between device cohorts.

RESULTS: 13,416 patients were included. Most patients underwent repair with a Gore Excluder (5,997; 44.7%). There was no difference in the rates of diabetes, hypertension, or end-stage renal disease between cohorts. Unadjusted outcomes are shown in Table 1. The rate of postoperative acute limb ischemia (ALI) was higher in overall patients who underwent repair with a Medtronic Endurant, as well as in subgroup analysis of patients with ruptured AAA. Patients who underwent repair with a Medtronic Endurant were more likely than those who underwent repair with a Gore Excluder (OR=2.06; 95% CI=1.49-2.86) or with a Cook Zenith device (OR=1.56; 95% CI=1.06-2.28), to have postoperative ALI. No differences between devices were associated with death, MACE, ischemic colitis, conversion to open or postoperative dialysis.

CONCLUSION: Overall, safety is similar among major endovascular stent grafts for EVAR, except for a higher rate of ALI following repairs with the Medtronic Endurant. Since with this study we cannot determine if the higher incidence of ALI relates to graft design, patient anatomy, or operative technique, future studies should be aimed to further evaluate this finding.

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Table.

	Cook Zenith (n=2,995)	Gore Excluder (n=5,997)	Medtronic Endurant (n=4,424)	P-Value
ELECTIVE EVAR				
Death	2.3%	2.9%	3.1%	.14
Major cardiovascular adverse events (MACE)	4.7%	4.3%	4.5%	.63
Conversion to open	0.77%	0.83%	0.68%	.58
Ischemic Cholitis	0.8%	1.2%	1.2%	0.22
Lower extremity ischemia	1.5%	1.1%	2.3%	<.0001
Dialysis	1.2%	1.1%	1.4%	.43
RUPTURE EVAR				
Death	16.9%	21.2%	24.8%	.07
Major cardiovascular adverse events (MACE)	13.7%	15.3%	15.5%	.8
Conversion to open	2.4%	3.4%	4.2%	.44
Ischemic Colitis	5.5%	7.6%	6.5%	.51
Lower extremity ischemia	1.2%	2.1%	6.5%	.0003
Dialysis	3.9%	5.7%	4.2%	.45

5:24 pm – 5:36 pm

50

Hypogastric Artery Flow Interruption is Associated with Increased Mortality after Open Aortic Repair

Jason Zhang, Heepeel Chang, Caron Rockman, Neal Cayne, Glenn Jacobowitz, Karan Garg - NYU Langone Health, New York, NY

INTRODUCTION: The two feared complications of pelvic flow disruption include buttock and mesenteric ischemia. Unilateral or bilateral hypogastric artery flow interruption, either from atherosclerosis or intentionally, is not well studied in open AAA repair (OAR).

METHODS: The Society for Vascular Surgery Quality Initiative database was queried for all patients undergoing elective open AAA repair between 2003 and 2020. Patients with data on their hypogastric arteries were stratified into two groups - patent bilaterally (normal pelvic perfusion, NPP), and unilateral or bilateral occlusion or ligation (compromised pelvic perfusion, CPP). Primary endpoints were 30-day major morbidity and mortality.

RESULTS: During the study period, 9.492 patients underwent elective open AAA repair - 860 (9.1%) with compromised pelvic perfusion and 8,632 (90.9%) with patent bilateral hypogastric arteries. The groups had similar cardiac risk factors (Table 1). A majority of patients in the CPP cohort had concurrent iliac aneurysms (63.3% versus 24.8%; p<.001). The perioperative mortality was significantly higher in patients with compromised pelvic perfusion (5.5% versus 3.1%; p<.001). Bilateral interruption had a higher perioperative mortality compared to unilateral interruption (7.1% versus 4.7%; p<001). The CPP group had increased rates of myocardial injury (6.7% versus 4.7%; p=.012), leg and bowel ischemia (3.5% versus 2.1%, p=.008; and 5.7% versus 3.4%, p<.001; respectively). On multivariable analysis, CPP was associated with increased mortality (OR 1.47, CI 1.14-1.88, p=.003). However, on Kaplan-Meier analysis, there was no difference on long-term survival.

CONCLUSIONS: CPP is associated with increased perioperative complications and higher mortality in patients undergoing OAR, with no affect on longer-term survival. Hypogastric artery occlusion or need for ligating these vessels likely signifies presence of more complex disease, and warrants careful technique and appropriate patient selection.

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Table. Demographics, Operative Findings and Post-Operative Outcomes

	Normal Perfusion	Compromised Perfusion	p-value
N (%)	8632 (90.9%)	860 (9.1%)	
Age (years)	69.5 (+/- 8.7)	68.7 (+/- 8.1)	.089
Age > 70 years	*52.2%*	*46.6%*	*.002*
Female	*24.3%*	*15.9%*	*< .001*
Caucasian	*90.2%*	*85.8%*	*< .001*
Current Smoking	*41.0%*	*41.0%*	*.993*
Infrarenal clamp	*55.2%*	*64.1%*	*< .001*
Iliac aneurysm	*24.8%*	*63.3%*	*< .001*
COPD	31.8%	32.9%	.483
HTN	84.1%	84.0%	.911
HD	0.7%	0.8%	.628
CKD (Cr>1.8)	5.2%	5.5%	.757
CAD	25.5%	28.0%	.115
Prior CABG	15.6%	17.6%	.206
Prior PCI	19.8%	19.3%	.787
CHF	7.0%	6.8%	.836
DM	14.3%	13.7%	.633
ASA use	71.3%	69.8%	.332
P2Y	8.4%	9.4%	.333
STATIN	74.5%	71.9%	.095
Beta Blockers	*63.6%*	*67.2%*	*.037*
ACE/ARB	49.6%	48.6%	.642
Patent IMA	61.6%	59.3%	.209
EBL > 500cc	86.9%	90.1%	.009
pRBC > 4 units	24.6%	25.2%	.754

	Normal Perfusion	Compromised Perfusion	p-value
Length of stay	8.8 (+/- 10.1)	9.8 (+/- 10.1)	.104
Postop MI	4.7%	6.7%	.012
Postop Respiratory	10.3%	11.9%	.149
Postop Renal Complication	15.9%	18.9%	.024
Leg ischemia	2.1%	3.5%	.008
Bowel ischemia	3.4%	5.7%	< .001
Mortality	3.1%	5.5%	< .001

5:36 pm – 5:48 pm

51

The Risk of Thromboembolic Events in COVID-19 Patients During the Height of the SARS-CoV-2 Pandemic

Janice Nam[1], Melissa D'Andrea[1], Alexander O'Hara[1], Lindsey Staszewski[1], Jacob Pozin[1], Amy Wozniak[1], Lindsey Korepta[2], Bernadette Aulivola[2] - [1]Loyola University Chicago Stritch School of Medicine, Maywood, IL; [2]Loyola University Medical Center, Maywood, IL

INTRODUCTION/OBJECTIVES: COVID-19 is associated with a prothrombotic state and elevated risk of thromboembolism. This study assesses the risk of thromboembolic events and their impact on hospitalization of COVID-19 inpatients.

METHODS: Retrospective review of all COVID-19 inpatients (≥18 years old) at a single academic institution from March 15, 2020 - July 1, 2020 was performed. Patient data included demographics, comorbidities, hospital admission type, thromboembolic events, laboratory values, use of anticoagulants/antiplatelets, hospital length of stay, and mortality.

RESULTS: Within 826 COVID-19 inpatients (56% male, 44% female) identified, 87 patients (10.5%) had 98 thromboembolic events. (Table 1). Hypertension, CAD, and CLTI were associated with increased incidence of thromboembolism ($p < 0.05$). Non-white patients had higher incidence of thromboembolism [OR (CI): 2.43 (1.279, 4.616), $p=0.007$]. As D-dimer increased by 500 unit increments, the odds of developing a thromboembolic event increased by 5.2% [OR (CI): 1.052 (1.027, 1.077), $p<0.001$]. (Table 2). Patients with thromboembolism had higher antiplatelet/anticoagulants usage ($p < .05$), longer hospital LOS (Mean: 17.8 vs. 9.0, $p < 0.001$), higher ICU admission (63% vs. 33%, $p<0.001$), and higher in-hospital mortality (28% vs 16%, $p = 0.006$). (Table 3).

CONCLUSIONS: Increased D-dimer, CAD, and CLTI are associated with elevated risk of thromboembolic events in hospitalized COVID-19 patients while smoking status had no association. Non-white patients had increased risk of thromboembolism. Patients with thromboembolism had higher antiplatelet/ anticoagulant usage, longer LOS, higher ICU admissions, and increased mortality.

Table 1. Types of Thromboembolic Events During Hospitalization

Thromboembolic event		**All, N =98 Total Events**
Venous Thromboembolism	DVT (Extremity)	15
	DVT (Non-extremity)	6
	Pulmonary Embolism	26
Arterial Thromboembolism	Aortic	1
	Splenic Artery	1
	Renal Artery	1
	Superior Mesenteric Artery	2
	Extremity Artery	2
Cerebrovascular Event	Ischemic Stroke	13
Cardiovascular Event	Myocardial Infarction	27
Coagulopathy	Disseminated Intravascular Coagulation	4

Table 2. Summary of Predictors by Outcome

	All, N=826N (%)	**No Thrombotic Events, N=739N (%)**	**Any Thrombotic Event, N=87N (%)**
Age, Median (Q1, Q3)	61.7 (49.4, 72.9)	61.2 (49, 72.6)	66.7 (52.6, 77)
Male	459 (56)	403 (55)	56 (64)
Race			
White	228 (28)	215 (29)	13 (15)
Black	205 (25)	176 (24)	29 (33)
Hispanic	255 (31)	225 (31)	30 (34)
Asian	17 (2)	15 (2)	2 (2)
Not Specified	119 (14)	106 (14)	13 (15)
Hispanic Ethnicity	429 (52)	386 (53)	43 (49)
Previous or Current Smoker	178 (36)	154 (36)	24 (39)
Comorbidities Prior to COVID-19 admission			
Diabetes	351 (44)	309 (43)	42 (49)
CKD	117 (15)	101 (14)	16 (19)
End-Stage Renal Disease	73 (9)	62 (9)	11 (13)
Hypertension	527 (65)	461 (64)	66 (76)
Hyperlipidemia	332 (41)	293 (41)	39 (46)
Coronary Artery Disease	152 (19)	128 (18)	24 (28)
Myocardial Infarction	60 (7)	49 (7)	11 (13)
Congestive Heart Failure	107 (13)	96 (13)	11 (13)
Peripheral Artery Disease	38 (5)	32 (4)	6 (7)
Chronic Limb-Threatening Ischemia	12 (1)	8 (1)	4 (5)
Chronic Obstructive Pulmonary Disease	56 (7)	46 (6)	10 (11)
Respiratory Failure	33 (4)	28 (4)	5 (6)

	All, N=826N (%)	No Thrombotic Events, N=739N (%)	Any Thrombotic Event, N=87N (%)
Previous PE	24 (3)	21 (3)	3 (3)
Previous DVT	46 (6)	37 (5)	9 (10)
Ischemic Stroke	78 (10)	67 (9)	11 (13)
Hemorrhagic Stroke	12 (1)	12 (2)	0 (0)
In-hospital Medication			
Any Antiplatelet	246 (30)	204 (28)	42 (48)
Any Anticoagulation	748 (93)	662 (92)	86 (99)
Creatinine, Median (Q1, Q3)	1 (0.8, 1.5)	1 (0.8, 1.4)	1.3 (0.9, 1.8)
D-Dimer, Median (Q1, Q3)	948 (477, 1998)	856.5 (466, 1627)	1842 (1005, 7429)
BUN, Median (Q1, Q3)	16 (11, 28)	15 (11, 27)	20 (13, 31)
Outcomes			
Length of Stay	6 (3, 12)	6 (3, 11)	13 (5, 30)
ICU Admission	300 (37)	245 (33)	55 (63)
Death	140 (17)	116 (16)	24 (28)

Table 3. Univariable and Multivariable Logistic Regression Results

	Univariable OR (CI)	P-Value*	Multivariable OR (CI), N=786	P-Value**
Age	1.013 (1, 1.028)	0.0562	1.006 (0.988, 1.024)	0.49972
Male	1.492 (0.94, 2.369)	0.0895	1.361 (0.825, 2.247)	0.22769
Other vs White Race	2.344 (1.273, 4.317)	0.0062	2.448 (1.29, 4.647)	0.00618
Hispanic	0.879 (0.563, 1.37)	0.5681		
Previous or Current Smoker	1.154 (0.666, 2.001)	0.6098		
Diabetes	1.26 (0.805, 1.973)	0.3112		
CKD	1.401 (0.783, 2.509)	0.2560		
End-Stage Renal Disease	1.563 (0.788, 3.101)	0.2010		
Hypertension	1.779 (1.064, 2.975)	0.0280	1.067 (0.569, 2.001)	0.83921
Hyperlipidemia	1.233 (0.785, 1.937)	0.3641		
Coronary Artery Disease	1.762 (1.061, 2.927)	0.0287	0.955 (0.484, 1.885)	0.89493
Myocardial Infraction	1.973 (0.984, 3.956)	0.0555	1.671 (0.715, 3.906)	0.23594
Congestive Heart Failure	0.956 (0.49, 1.866)	0.8960		
Peripheral Artery Disease	1.597 (0.648, 3.936)	0.3088		
Chronic Limb-Threatening Ischemia	4.289 (1.264, 14.551)	0.0195	2.715 (0.649, 11.353)	0.17121
COPD	1.909 (0.926, 3.934)	0.0799	1.449 (0.618, 3.396)	0.39400
Respiratory Failure	1.509 (0.567, 4.016)	0.4098		
Previous PE	1.192 (0.348, 4.082)	0.7795		
Previous DVT	2.136 (0.994, 4.592)	0.0519	1.122 (0.441, 2.853)	0.80840
Ischemic Stroke	1.415 (0.717, 2.794)	0.3174		
Any Antiplatelet	2.375 (1.513, 3.726)	0.0002	1.731 (0.995, 3.012)	0.05206
Any Anticoagulation***	7.525 (1.03, 54.952)	0.0466		
Elevated Creatinine****	1.972 (1.24, 3.14)	0.0041	1.413 (0.708, 2.819)	0.32676
D-DIMER, per 500 unit increase	1.055 (1.031, 1.079)	<.0001	1.051 (1.026, 1.076)	0.00005
BUN, per 5 unit increase	1.053 (1.006, 1.102)	0.0279	0.98 (0.909, 1.056)	0.59174

5:48 pm – 5:56 pm

52 (RF)

A Single Center Experience with Forearm Arteriovenous Loop Grafts for Hemodialysis

Ian M. Brastauskas, Nimesh Patel, Zachary German, Jeanette Stafford, Matthew Edwards, Mariana Muera, Gabriela Velazquez, Matthew P. Goldman, Ross P. Davis - Wake Forest Baptist Health, Winston-Salem, NC

OBJECTIVES: Autogenous arteriovenous fistula (AVF) remains the standard of care for hemodialysis (HD) access, however, it cannot be reasonably obtained in all patients. For patients with contraindications to AVFs, prosthetic arteriovenous graft (AVG) remains an alternative. AVGs are plagued by high failure rates, however, there is a paucity of literature examining this. This study aims to examine a single-center review of outcomes of forearm loop AVGs in patients requiring HD access.

METHODS: A single institution, retrospective chart review was completed from 2012-2019, including patient demographics, end-stage renal disease (ESRD) etiology, brachial artery and vein diameters, and comorbidities. Logistic regression and cox proportional hazard models were evaluated. Outcomes were defined as length of primary patency (time from graft placement to intervention to maintain patency) and secondary patency (time from graft placement until graft failure despite intervention).

RESULTS: 98 patients [mean age 61.8(13.9) years, 42.9% female] were identified as having brachial artery to brachial vein AVG creation during the study period. Primary patency was 0.36 (SE 0.07) at six months, 0.12 (0.05) at one year. Secondary patency was 0.75 (0.07) at six months and 0.43 (0.09) at one year (Figure 1A and 1B). No association between preoperative vessel diameters and primary or secondary patency was observed.

CONCLUSION: Prosthetic forearm loop AVGs remain hindered in their utility as they show high rates of graft failure within a year of creation. A significant patient-specific factor leading to this was not clearly demonstrated. As guidelines change regarding the nature of dialysis access for patients on HD, these results draw into question the utility of prosthetic forearm loop grafts in patients requiring long-term HD access.

Figure 1A. Primary Functional Patency

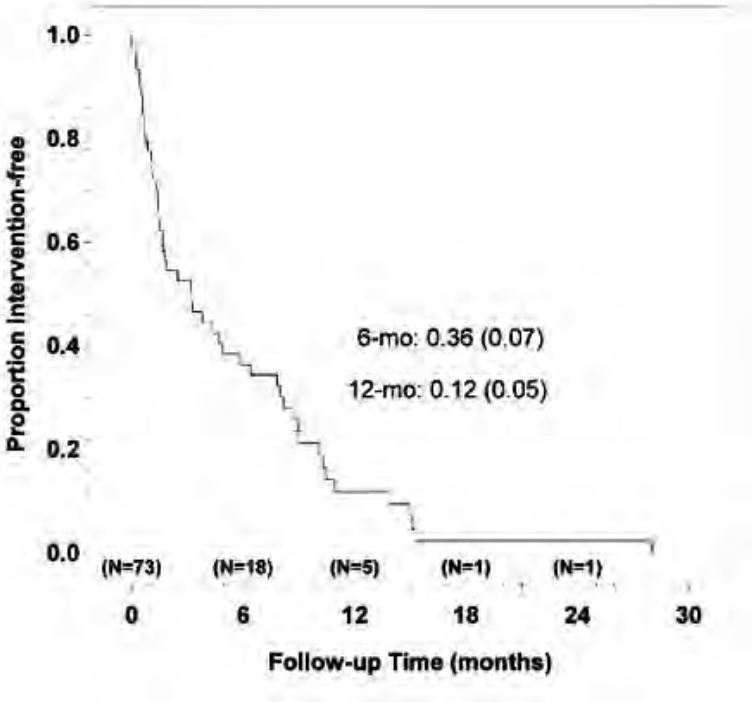
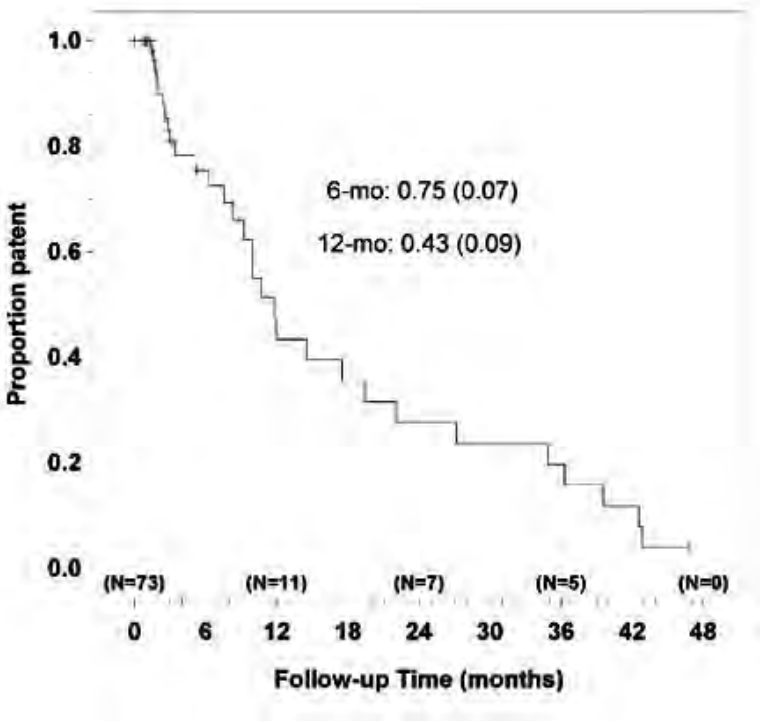


Figure 1B. Secondary Patency



5:56 pm – 6:04 pm

53 (RF)

Revision of Aneurysmal Arteriovenous Access with Immediate Use Graft is Safe and Avoids Prolonged use of Tunneled Hemodialysis Catheters

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INTRODUCTION AND OBJECTIVES: Tunneled dialysis catheters (TDC) in patients requiring long-term dialysis are associated with significantly increased mortality compared to arteriovenous fistulas (AVF). Aneurysmal AVF pose a difficult treatment dilemma for vascular surgeons. We aimed to elucidate the outcomes of aneurysmal AV access revision with aneurysm resection and Artegraft Collage Vascular Graft placement to avoid prolonged TDC use.

METHODS: We reviewed patients with aneurysmal AV access in which the access was revised with aneurysm resection and jump graft placement at a single institution from 2018 to 2021. Outcomes were time to cannulation, reintervention rates, time to reintervention and patency.

RESULTS: A total of 41 patients with revised aneurysmal AV access were studied, of which 26.8% (n=11) had perioperative TDC placement. Three patients were done for emergent bleeding. The cohort was 58.5% male (n=24) with a median age of 58 years (IQR: 49-65). Most patients had brachiocephalic AVF (n=31 [75.6%]). Median follow up time was 315 days. Median time to cannulation was 3 days. Time to cannulation was significantly longer in patients with perioperative TDC as compared with those without TDC (24 days vs. 1 day, $P<0.001$). Reintervention was required in 39.0% of patients (n=16), at median time of 30 days. At 30, 90, and 180 days, primary patency rates were 82.9%, 75.5% and 66.6%, primary assisted patency rates were 92.7%, 85.2% and 76.1%, and secondary patency rates were 100%, 97.4% and 90.9% respectively.

CONCLUSIONS: Revision of aneurysmal AV access with Artegraft as jump graft is safe, with acceptable short and mid-term patency results. This allows dialysis patients to continue to have a functional access, decreasing the need for tunneled catheter and reducing the associated risk of sepsis and increased mortality. This should be considered for all patients with aneurysmal, dysfunctional fistulas to maintain AV access and avoid TDC placement.

7:00 pm – 10:00 pm

PRESIDENT'S DINNER

Tickets Required

Notes

Notes

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!


VESS
Vascular & Endovascular
Surgery Society
Formerly PVSS, founded 1976

Schedule-at-a-Glance

Thursday, January 27, 2022

7:00 am - 8:00 am	Continental Breakfast
7:00 am - 5:00 pm	Registration
7:30 am - 12:15 pm	Vascular Fellows Program
7:30 am - 12:15 pm	General Surgery Resident Program
7:30 am - 2:00 pm	Student Mentor Program
12:15 pm - 12:45 pm	Lunch Break
12:345 pm - 3:45 pm	Technology Forum
4:00 pm - 6:00 pm	Scientific Session I
6:00 pm - 6:30 pm	Industry Session
6:30 pm - 8:00 pm	Welcome Reception

Friday, January 28, 2022

6:00 am - 7:00 am	Continental Breakfast
6:00 am - 9:30 am	Registration
7:00 am - 9:04 am	Scientific Session II
9:30 am - 11:00 am	Interesting Case Report Session 1
1:00 pm - 2:00 pm	Ask the Experts Session
2:30 pm - 3:00 pm	Industry Session
3:00 pm	Registration Re-Opens
3:00 pm - 4:00 pm	Coffee/Snacks
4:00 pm - 6:00 pm	Scientific Session III
6:00 pm - 7:00 pm	VESS Member Business Meeting (Members Only)
6:15 pm - 7:00 pm	Industry Session

Saturday, January 29, 2022

6:00 am - 7:00 am	Continental Breakfast
6:00 am - 9:30 am	Registration
7:00 am - 9:00 am	Scientific Session IV
8:15 am - 9:00 am	Award Session
9:00 am - 9:15 am	Introduction of the President
9:15 am - 10:00 am	Presidential Address
10:30 am - 11:30 pm	Interesting Case Report Session 2
1:00 pm - 2:00 pm	Ask the Experts Session
2:00 pm - 2:30 pm	Industry Session
2:30 pm - 3:00 pm	Industry Session
3:00 pm	Registration Re-Opens
3:00 pm - 4:00 pm	Coffee/Snacks
4:00 pm - 6:00 pm	Scientific Session V
7:00 pm - 10:00 pm	President's Dinner (Ticket Required)

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