47TH ANNUAL MEETING

New England Society *for* Vascular Surgery

SEPTEMBER 11-12, 2020

[VIRTUAL]

ADMINISTRATIVE OFFICE

100 Cummings Center, Suite 124-A · Beverly, Massachusetts 01915 · Email: nesvs@administrare.com

Website: www.nesvs.org

2019 - 2020 EXECUTIVE COUNCIL & COMMITTEES

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Councilor-at-Large ..... Courtney J. Warner, MD
Councilor-at-Large ..... Robert T. Lancaster, MD
Postgraduate Course Director ..... C. Keith Ozaki, MD

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David Stone, MD
Mark Conrad, MD
Mark Wyers, MD
Andres Schanzer, MD, Ex-Officio
Sean P. Roddy, MD, Ex-Officio

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Raul Guzman, MD
Jeffrey Siracuse, MD
Andres Schanzer, MD

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Andres Schanzer, MD, Ex-Officio
Sean P. Roddy, MD, Ex-Officio

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Richard J. Powell, MD

LIAISON DELEGATE TO SVS

Andres Schanzer, MD

VASCULAR SURGERY BOARD OF THE ABS

C. Keith Ozaki, MD

VLFDC RESEARCH COUNCIL DELEGATE

Courtney J. Warner, MD

POSTGRADUATE COURSE DIRECTOR

C. Keith Ozaki, MD

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Glenn M. LaMuraglia, MD
Sean P. Roddy, MD
Andres Schanzer, MD
Jessica Simons, MD

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Courtney J. Warner, MD
Robert T. Lancaster, MD
Andres Schanzer, MD, Ex-Officio

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Julie Lahiri, MD
Courtney J. Warner, MD
Robert T. Lancaster, MD

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Julianne Stoughton, MD
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Alexis Cascadden, PA-C
Devon Robichaud, NP
Athena Drosos, PA-C
Nicole Meregian, PA-C
Pam Garofalo, APRN
Mary Sytek, MSN

PAST PRESIDENTS

Robert R. Linton 1973
Ralph A. Deterling, Jr. 1974
Frank C. Wheelock, Jr. 1975
Fiorindo A. Simeone 1976
Allan D. Callow 1977
Richard Warren 1978
William W.L. Glenn 1979
R. Clement Darling, Jr. 1980
Rodger E. Weismann 1981
Edward A. Edwards 1982
Edwin W. Salzman 1983
Horace C. Stansel, Jr. 1984
Donald C. Nabseth 1985
Thomas J. Donovan 1986
Nathan P. Couch 1987
H. Brownell Wheeler 1988
Robert W. Hopkins 1989
Michael Hume 1990
Paul Friedmann 1991
Bruce S. Cutler 1992
Thomas F. O'Donnell, Jr. 1993
John A. Mannick 1994
John J. Skillman 1995
Anthony D. Whittemore 1996
Jack L. Cronenwett 1997
Carl E. Bredenberg 1998
David C. Brewster 1999
Frank W. LoGerfo 2000
James O. Menzoian 2001
William Abbott 2002
David B. Pilcher 2003
Robert M. Zwolak 2004
Magruder C. Donaldson 2005
William C. Mackey 2006
Daniel B. Walsh 2007
Richard P. Cambria 2008
Jens Eldrup-Jorgensen 2009
Frank B. Pomposelli 2010
Bauer E. Sumpio 2011
Michael Belkin 2012
R. Clement Darling 2013
Mark F. Fillinger 2014
Robert B. Patterson 2015
Michael T. Watkins 2016
Glenn M. LaMuraglia 2017
Richard J. Powell 2018

PAST VICE PRESIDENTS

Richard C. Britton 1974
Thomas J. Donovan 1975
Ferris S. Ray 1976
Rodger E. Weismann 1977
Emerson H. Drake 1978
John H. Davis 1979
Clement A. Hiebert 1980
Michael Hume 1981
Robert W. Hopkins 1982
Donald C. Nabseth 1983
Carl S. Hoar 1984
H. Brownell Wheeler 1985
James M. Shannon 1986
David B. Pilcher 1987
Richard C. Karl 1988
Thomas F. O'Donnell, Jr. 1989
John B. Herrmann 1990
David M. Sensenig 1991
James O. Menzoian 1992
John J. Skillman 1993
James W. Squires 1994
Gary W. Gibbons 1995
Nicholas A. Sannella 1996
Baltej S. Maini 1997
Richard J. Gusberg 1998
Magruder C. Donaldson 1999
Charles E. Dixon 2000
A. David Drezner 2001
Nancy L. Cantelmo 2002
Wilfred I. Carney, Jr. 2003
Robert B. Patterson 2004
Elias J. Arous 2005
Randolph D. Maloney 2006
Andrew C. Stanley 2007
Paul A. Skudder 2008
Steven T. Ruby 2009
James J. Gallagher 2010
Lawrence M. Hoepp 2011
David R. Campbell 2012
Hubert A. Johnson 2013
Robert E. Hawkins 2014
Roger C. Rosen 2015
Guy Lancellotti 2016
Julianne Stoughton 2017
Samuel C. Aldridge 2018

PAST SECRETARIES

R. Clement Darling 1973–1979
Nathan P. Couch 1979–1984
Bruce S. Cutler 1984–1991
Jack L. Cronenwett 1991–1997
James O. Menzoian 1997–2000
Magruder C. Donaldson 2000–2004
Frank B. Pomposelli 2004–2009
Robert B. Patterson 2009–2013
Richard J. Powell 2013–2017
Andres Schanzer 2017–Present

PAST TREASURERS

R. Clement Darling 1973–1978
David C. Brewster 1978–1982
Rudolph W. Vollman 1982–1987
James W. Squires 1987–1992
Wilfred I. Carney, Jr. 1992–1997
Nancy L. Cantelmo 1997–2001
William C. Mackey 2001–2004
Jens Eldrup-Jorgensen 2004–2007
Michael Belkin 2007–2011
Glenn M. LaMuraglia 2011–2016
Marc Schermerhorn 2016–2018
Robert A. Cambria 2018–Present

PAST RECORDERS

William M. Abbott 1979–1982
M. David Tilson 1982–1987
Paul Friedmann 1987–1990
Anthony D. Whittemore 1990–1995
Frank W. LoGerfo 1995–1999
Daniel B. Walsh 1999–2003
Richard P. Cambria 2003–2004
Bauer E. Sumpio 2004–2007
Mark F. Fillinger 2007–2012
Andrew C. Stanley 2012–2017
Sean P. Roddy 2017–Present

DETERLING AWARD

The Deterling Award of the New England Society for Vascular Surgery was established to stimulate and encourage original investigation in vascular disease conducted by vascular fellows, surgical residents or medical students.

It is named in honor of Ralph A. Deterling, Jr., MD (1917–1992), the second president of the NESVS, who contributed much to the formation of this Society. Dr. Deterling served as Professor of Surgery and Chairman of the Department of Surgery at Tufts University School of Medicine and Surgeon-in-Chief of the New England Medical Center. This award was established in his name in recognition of the high regard his trainees, colleagues and members of the Society held for him.

The Deterling Award is presented annually in recognition of an outstanding original paper presented by a fellow, resident, or medical student at the Society's annual meeting. Work considered for the Deterling Award may be either in basic science or clinical research. Recipients currently receive an award of $1,000 and a certificate of recognition.

DETERLING AWARD RECIPIENTS

Mark F. Fillinger 1993
Sidhu P. Gangadharan, B.S. 1994
David Marshall Lee, B.A. 1995
Khurram Kamal 1996
Subodh Arora 1997
Wallace Tarry 1997
Gilbert R. Upchurch, Jr. 1998
Joerg Heckencamp 1999
Patrick J. Casey 2000
Craig S. Seidman 2001
Eva Rzucidlo 2002
Thomas Abbruzzese 2003
Hong T. Hua 2004
Mark F. Conrad 2005
Marvin D. Atkins, Jr. 2006
Andres Schanzer 2007
Kristina Giles 2008
Robert S. Crawford 2009
Meghan Dermody 2010
Omar Haqqani 2011
Robert Lancaster 2012
Kristina Giles 2013
Christopher Durham 2014
John McCallum 2015
Samuel Schwartz 2016
Jennifer L. Perri 2017
Rens Varkevisser 2018
Mohammad Alqaim & Gaurav Sharma 2019

R. CLEMENT DARLING AWARD

The Darling Award of the New England Society for Vascular Surgery was originally established to stimulate and recognize excellence in clinical research on vascular disease conducted by a fellow, resident or medical student. The Darling Award wil now recognize both basic science and clinical research.

The award was established in 1998 in honor of R. Clement Darling, Jr., MD (1927–1999), a founding member and eighth president of the NESVS. Dr. Darling was a native New Englander who served for over 35 years as a vascular surgeon and teacher at the Massachusetts General Hospital. The award celebrates Dr. Darling's lasting contributions to patient care, surgical education and the NESVS.

The Darling Award is presented annually in recognition of an outstanding original paper presented by a fellow, resident or medical student at the Society's annual meeting. Work considered for the Darling Award may be either in basic science or clinical research. Recipients currently receive an award of $1,000 and a certificate of recognition.

DARLING AWARD RECIPIENTS

Peter R. Nelson 1999
Stephen R. Lauterbach 2000
Amy B. Reed 2001
Malachi Sheahan 2002
Carlos Timaran 2003
Brian W. Nolan 2004
Virendra I. Patel 2005
Christopher Owens 2006
Robert Chang 2007
Adam W. Beck & Philip Goodney 2008
Christopher J. Abularrage 2009
Jessica Wallaert 2010
Matthew Sweet 2011
Jessica Simons 2012
Edward Arous 2013
Jesse Columbo 2014
Peter Soden 2015
Katie Shean 2016
Leia Edenfield 2017
Jahan Mohebali 2018
Jesse Columbo 2019

PAST DISTINGUISHED ADDRESSES

1986 Robert A. Leather, MD
Current Status of In Situ Saphenous Vein Bypass Grafting

1987 Lester R. Sauvage, MD
A Unified Perspective of Arterial Grafts

1988 John J. Bergan, MD
Problems in the Popliteal Fossa

1989 D. Eugene Strandness, Jr., MD
The Non-Invasive Evaluation of Renovascular and Mesenteric Artery Occlusive Disease

1990 Alexander W. Clowes, MD
Prevention of Stenosis After Vascular Reconstruction: Pharmacological Control of Intimal Hyperplasia

1991 Jesse E. Thompson, MD
Some Observations of Vascular Surgery History

1992 Robert W. Barnes, MD
Vascular Surgery: The Burr Under the Saddle

1993 Norman R. Hertzer, MD
Health Care Reform in Vascular Surgery: Where We Stand and How We Got There

1994 Frank J. Veith, MD
Endovascular Stented Grafts: Role and Impact on Vascular Surgeons

1995 James S. T. Yao, MD
Vascular Injuries in Athletes

1996 F. William Blaisdell, MD
Heparin: Controversies and Misconceptions

1997 Juan C. Parodi, MD
Evolution and Current Results of Endovascular Aneurysm Repair

1998 James C. Stanley, MD
Renovascular Hypertension at the Close of the Millennium: Pharmacologic, Endovascular and Conventional Surgical Therapy

1999 C. Melville Williams, MD
What We Know and Don't Know About the Natural History of Dissecting Aneurysms of the Descending Thoracic Aorta: Implications for Stent Graft Therapy

2000 Thomas Fogarty, MD
Vascular Surgeons in the New Millennium

2001 Colleen M. Brophy, MD
Stress of Life From Man To Molecules

2002 Peter J. Deckers, MD
Professionalism, Quality and an Evolving Health Care Delivery System

2003 Wesley S. Moore, MD
50 Years of Progress in the Management and Prevention of Ischemic Stroke

PAST DISTINGUISHED ADDRESSES (CONTINUED)

2004 Julie Freischlag, MD
Abdominal Aortic Aneurysms: How Things Have Changed Over 50 Years

2005 Patrick Morrisey, JD
The Impact of the MMA: Healthcare From the Inside

2006 Anthony D. Whittemore, MD, FACS
Impact of Professionalism of Safe Surgical Care

2008 Brian H. Annex, MD
Advances in Lower Extremity PAD: From Genetics to Novel Therapeutics

2009 Ronald L. Dalman, MD
Modifiable Risks for Aneurysm Progression: Updates From the Stanford SCCOR in AAA Disease

2010 David Hanscom, MD & David Elaimy
Awake at the Wound

2011 Glenn D. Steele, Jr., MD, PhD
Re-Engineering Systems of Care – Surgical Leadership

2012 Professor Christos Liapis
Carotid Artery Interventions in the Post-RCTs Era

2014 Joseph P. Vacanti, MD
Regenerative Medicine Through the Eyes of a Surgeon

Bao-Ngoc Nguyen, MD
Vascular Surgeons and Wound Healing—Beyond the Successful Revascularization

2018 Bruce Perler, MD
An Evidenced-Based Approach to Asymptomatic Carotid Artery Disease: Nihilism is Not Appropriate or Acceptable

2019 Jack Cronenwett, MD
The Vascular Quality Initiative: Innovation and Inspiration from New England

PAST LINTON LECTURERS

1989 Allan D. Callow, MD
Gene Therapy and the Vascular Surgeon

1990 John A. Mannick, MD
Reflections on Surgery for Aortic Aneurysm

1991 Michael A. Gimbrone, Jr., MD
Vascular Endothelial Leukocyte Interactions: Molecular Mechanisms and Pathophysiological Consequences

1992 Robert S. Lees, MD
Arteriosclerosis: A Reversible Disease

1993 Valentin Fuster, MD
Pathogenesis of Atherosclerosis: New Advances Based on the Understanding of Coronary Vascular Biology

1994 Jeffrey A. Gelfrand, MD
A New Role for Coagulation and the Platelet in Atherogenesis: Modulation of Cytokine Synthesis

1995 Peter Libby, MD
Regulation of the Stability of Atherosclerotic Plaques

1996 Margot Kruskall, MD
Creating A Universal Blood Supply: The Enzymatic Conversion to Group O of A and B Red Cells

1997 Victor Dzau, MD
Gene Transfection Therapy for Preventing Vein Graft Stenosis in Infrainguinal Grafts

1998 Robert S. Langer, ScD
Biomaterials and How They Will Change Our Lives

1999 Thomas Maciag, PhD
Molecular Mechanisms of Angiogenesis

2000 William M. Abbott, MD
The Science of Arterial Prosthesis: Past Frustrations and Future Promise

2001 Gregario A. Sicard, MD
The Impact of Endovascular Surgeons in the Training of Vascular Residents

2002 John A. Mannick, MD
Fifty Years of Infrainguinal Reconstruction: What Have We Learned

2003 Judah Folkman, MD
Angiogenesis-Dependent Disease

2004 Edith Tzeng, MD
Molecular Therapies and the Vascular Surgeon

2005 Richard M. Green, MD
Challenges for the Practicing Vascular Surgeon

2006 Daniel Levy, MD
Toward A Modern Understanding of Vascular Disease: The Journey From Futility to Promise

2007 Paul Friedmann, MD
Surgical Competence

PAST LINTON LECTURERS (CONTINUED)

2008 Peter Gloviczki, MD
Open Venous Surgery in the Era of the Endovenous Revolution

2009 Robert Rutherford, MD
Changing Perspectives in the Management of Abdominal Aortic Aneurysm

2010 Jack L. Cronenwett, MD
The Role of Vascular Surgeons in Quality Improvement

2011 Frank W. LoGerfo, MD
The Biology of Vascular Injury

2012 Frans Moll, MD, PhD, Professor
Reflections on Predicting the Unpredictable AAA

2013 Paul Ridker, MD, MPH
Inflammation and Atherothrombosis: Where Have We Been? Where Are We Going?

2015 Tara Mastracci, MD
Ensuring the Durability of Endovascular Aortic Repair

2016 Spence M. Taylor, MD
Lower Extremity Peripheral Arterial Disease: A Perspective After 25 Years

2017 Omaida C. Velazquez, MD
Leap Forward Innovations in Vascular Disease: The Surgeon's Role

2018 Michael Jaff, DO
The Changing Healthcare Environment: What this Means for the Vascular Specialist

2019 Peter A. Schneider, MD
Where Do Innovations Come From?

LEARNING OBJECTIVES

The overall purpose of this activity is to enable the learner to:

1. Become familiar with current data on endovascular aneurysm repair, including indications, sizing, and outcomes such as endoleak.
2. Become familiar with current trends and evidence for various options for carotid revascularization.
3. Review current data in lesser-studied areas of vascular care including wound infections, venous ulcers, postoperative medication regimens, vascular training paradigms, etc.

ACCREDITATION INFORMATION

ANNUAL MEETING ACCREDITATION STATEMENT & CREDIT DESIGNATION

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

PHYSICIANS
Amedco, LLC designates this live activity for a maximum of 5.5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NURSES
Amedco, LLC designates this activity for a maximum of 5.5 ANCC contact hours.

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.

POSTGRADUATE COURSE ACCREDITATION STATEMENT & CREDIT DESIGNATION

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

PHYSICIANS
Amedco, LLC designates this live activity for a maximum of 2.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NURSES
Amedco, LLC designates this activity for a maximum of 2.75 ANCC contact hours.

ALLIED HEALTH PROGRAM ACCREDITATION STATEMENT & CREDIT DESIGNATION

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

PHYSICIANS
Amedco, LLC designates this live activity for a maximum of 3.50 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NURSES
Amedco, LLC designates this activity for a maximum of 3.50 ANCC contact hours.

2020 ALLIED HEALTH PROGRAM (SEPARATE SUBSCRIPTION)

(Presentations available beginning Friday, September 11 and will remain online for 90-days in the NESVS library.)

Co-Directors: Palma Shaw, MD & Alik Farber, MD

SESSION 1: ANEURYSMS, CAROTID DISEASE AND CRITICAL CARE

1 SVS Guidelines for Aortic Aneurysm Management: Current Recommendations for Surveillance, When to Treat and How to Follow These Patients after Repair
Jessica Fernandes, PA-C, Boston Medical Center, Boston, MA

2 Repair of Abdominal Aortic Aneurysms – Open vs. EVAR: Pre-Operative Planning and Decision Making
Alik Farber, MD, MBA, Boston Medical Center, Boston, MA

3 Strategies for Post-Operative Management of Patients Undergoing Open Thoracic Aneurysm Repair and TEVAR
Palma Shaw, MD, SUNY Upstate Medical Center, Syracuse, NY

4 Evaluation and Work Up of Carotid Stenosis
Athena Drosos, PA-C, Boston Medical Center, Boston, MA

5 Best Treatment of Carotid Artery in 2020: Medical Therapy vs. Carotid Endarterectomy vs. Carotid Stenting
Robin Rose, PA Yale School of Medicine, New Haven, CT

6 Immediate Post-Operative Management after Carotid Intervention
Jennifer Gonzalez, PA, Boston Medical Center, Boston, MA

SESSION 2: PAD, DIALYSIS ACCESS AND VENOUS DISEASE

7 Strategies for Evaluation and Work Up of a Patient with Peripheral Arterial Disease: When to Intervene?
Cassius Chaar, MD, Yale Medical Group, New Haven, CT

8 What Happens after Major Amputation: Timeline to Recovery
Jennifer Gonzalez, PA, Boston Medical Center, Boston, MA

9 Hemodialysis Access: How to Decide on the Best Surgical Dialysis Access
Colin Flynn, PA-C, Boston Medical Center, Boston, MA

10 Diagnosis and Treatment of Dialysis Access Complications
Jonathan Cardella, MD, Yale Medical Group, New Haven, CT

11 Latest Therapies in Management of Varicose Veins and Superficial Venous Insufficiency
Julianne Stoughton, MD, Massachusetts General Hospital, Boston, MA

12 Acute Deep Vein Thrombosis: How to Treat and When to Intervene
Pamela Garofalo, APRN, Yale University, New Haven, CT

13 Post-Operative Delirium Following Vascular Surgery
Ashley Volles, PA, SUNY Upstate Medical Center, Syracuse, NY

SESSION 3: MEDICAL MANAGEMENT AND CLINICAL PRACTICE

14 New Anticoagulants: What You Need to Know
Lauren O'Connell, ACNP, UMass Memorial, Worcester, MA

2020 ALLIED HEALTH PROGRAM (CONTINUED)

15 **Best Medical Therapy for the Vascular Patient: What You Need to Know**
Mallory Gibbons, ACNP, UMass Memorial, Worcester, MA

16 **Outpatient Practice: Surveillance for Lower Extremity Revascularization, Carotid Disease and Aneurysmal Disease**
Tracy Vaughn, PA, SUNY Upstate Medical Center, Syracuse, NY

17 **Type B Aortic Dissection: Medical vs. Intervention – When and How**
Andres Schanzer, MD, UMass Memorial, Worcester, MA

18 **Lumbar Drains – Indications, Care of, Management and Complications**
Devon Robichaud, NP, UMass Memorial, Worcester, MA

19 **Varicose Vein Management for the Vascular PA/NP: What You Need to Know**
Kristin Maurer, PA, Brigham & Women's Hospital, Boston, MA

INTERESTING CASES: COMPLICATIONS AND MANAGEMENT

Interesting Case #1: **AAA Repair**
Devon Robichaud, NP, UMass Medical, Worcester, MA

Interesting Case #2: **Acute Limb Ischemia**
Carla Moreira, MD, Brown Physicians, Providence, RI

Interesting Case #3: **Acute Iliofemoral DVT**
Jeffrey Siracuse, MD, Boston Medical Center, Boston, MA

Interesting Case #4: **PAD – Diabetic Foot/Limb Salvage**
Jessica Fernandes, PA-C, Boston Medical Center, Boston, MA

2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

FRIDAY, SEPTEMBER 11, 2020

8:00 am – 10:50 am	POSTGRADUATE COURSE (Separate Subscription) Practical Technical Tips—How I Do It Moderators: C. Keith Ozaki, MD & Rebecca Scully, MD
8:00 am – 8:05 am	Welcome
8:05 am – 8:15 am	PG1 Endovascular Carotid Artery Interventions Including TCAR Palma Shaw, MD SUNY Upstate Medical Center, Syracuse, NY
8:15 am – 8:25 am	PG2 Eversion Carotid Artery Endarterectomy Courtney Warner, MD Albany Med Vascular Surgery, Albany, NY
8:25 am – 8:35 am	PG3 Carotid Artery Endarterectomy Under Regional Anesthetic Jennifer A. Stableford, MD Dartmouth-Hitchcock Medical Center, Lebanon, NH
8:35 am – 8:50 am	PG4 Percutaneous Venous Ablation Julianne Stoughton, MD Massachusetts General Hospital, Boston, MA
8:50 am – 9:00 am	PG5 Acute DVT Thrombolysis Britt Tonnessen, MD Yale Vascular Surgery, New Haven, CT
9:00 am – 9:15 am	PG6 Fenestrated Aortic Endografts Jessica Simons, MD University of Massachusetts, Worcester, MA
9:15 am – 9:25 am	Group Q & A (Speakers 1-6) (Live)
9:25 am – 9:40 am	PG7 Open Thoraco-Abdominal Aortic Aneurysm Repair Sunita Srivastava, MD Massachusetts General Hospital, Boston, MA
9:40 am – 9:55 am	PG8 Tibial Endovascular Interventions Anahita Dua, MD Massachusetts General Hospital, Boston, MA
9:55 am – 10:05 am	PG9 Pedal/Plantar Loop Reconstruction for CLTI Carla C. Moreira, MD Alpert Medical School of Brown University, Providence, RI

2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

10:05 am – 10:20 am

PG10
Femoral-Tibial Bypass
Elizabeth Blazick, MD
Maine Medical Center, Portland, ME

10:20 am – 10:30 am

PG11
Percutaneous Hemodialysis Access Creation, Maintenance and Salvage
Dejah Judelson, MD
University of Massachusetts, Worcester, MA

10:30 am – 10:40 am

PG12
Anterior Spine Exposures
Christine Lotto, MD
Capital Health Hospital, Pennington, NJ

10:40 am – 10:50 am

Group Q & A (Speakers 7-12) (Live)

10:50 am – 10:55 am

Break

11:00 am – 12:05 pm

SCIENTIFIC SESSION I (Live)
(8-minute presentation / 4-minute Q & A)
Moderators: Marc Schermerhorn, MD & Andres Schanzer, MD

11:00 am – 11:05 am

Introduction from the Moderator

11:05 am – 11:17 am

1♦
Intraoperative EEG Changes During TCAR are More Frequent than Previously Reported
Laura C. Lamb, Edward Gifford, Parth Shah, Ilene Staff, Akhilesh Jain, James Gallagher, Gaurav Rana, Thomas Divinagracia - Hartford Healthcare, Hartford, CT

11:17 am – 11:29 am

2 ♦
Natural History of Late Type 1a Endoleaks
Thomas FX O'Donnell, Jahan Mohebali, Laura T. Boitano, Glenn M. LaMuraglia, Christopher J. Kwolek, Mark F. Conrad - Massachusetts General Hospital, Boston, MA

11:29 am – 11:41 am

3
A Significant Proportion of Current United States EVAR Practice Fails to Meet SVS Clinical Practice Guideline Recommended AAA Diameter Treatment Thresholds
Salvatore T. Scali[1], Bjoern D. Suckow[2], Philip P. Goodney[2], Thomas S. Huber[1], Gilbert R. Upchurch, Jr.[1], Dan Neal[1], Jesse A. Columbo[2], Jeanwan Kang[2], Marc L. Schermerhorn[3], Richard J. Powell[2], David H. Stone[2] - [1]University of Florida, Gainesville, FL; [2]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [3]Beth Israel Deaconess Medical Center, Boston, MA

11:41 am – 11:53 am

4 ♦
The Impact of Completion and Follow-Up Endoleaks on Survival, Reintervention and Rupture
Chun Li[1], Livia de Guerre[1], Kirsten Dansey[1], Jinny Lu[1], Priya B. Patel[1], Mahmoud B. Malas[2], Douglas W. Jones[4], Marc L. Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of California San Diego Health System, San Diego, CA; [3]Boston Medical Center, Boston, MA; [4]UMASS Memorial Medical Center, Worcester, MA

11:53 am – 12:05 pm

5
The Medical Resource Utilization and Financial Impact of Infection on Venous Leg Ulcers
Mark D. Iafrati[1], Raffi Melikian[2], Thomas F. O'Donnell, Jr.[1] - [1]Tufts Medical Center, Boston, MA; [2]Tufts Medical School, Boston, MA

♦ Deterling/Darling Award Finalist

2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

12:15 pm – 12:40 pm

INDUSTRY SPONSORED SYMPOSIUM #1 (Live)
Utility of a Disease-Specific Approach to TBAD—Real-World Application and Disease Management Strategies
Joseph Lombardi, MD

Presented by: Cook Medical

12:45 pm – 1:10 pm

INDUSTRY SPONSORED SYMPOSIUM #2 (Live)
The New Treo Abdominal Stent-Graft by Terumo Aortic—Introduction to the NESVS
Akhilesh K. Jain, MD, Michael Stoner, MD & Naiem Nassiri, MD

Presented by: Terumo Aortic

1:10 pm – 1:40 pm

Break

1:45 pm – 3:02 pm

SCIENTIFIC SESSION II (Live)
(8-minute presentation / 4-minute Q & A)
Moderator: Jessica Simons, MD & Kimberly Malka, MD

1:45 pm – 1:50 pm

Introduction from the Moderator

1:50 pm – 2:02 pm

6 ♦
The Degree of Oversizing in Endovascular Aortic Aneurysm Repair
Livia de Guerre[1], Rens Varkevisser[1], Nicholas Swerdlow[1], Chun Li[1], Salvatore Scali[2], Virendra Patel[3], Joost van Herwaarden[4], Marc Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of Florida Health, Gainesville, FL; [3]Columbia University Irving Medical Center, New York, NY; [4]UMC Utrecht, Utrecht, Netherlands

2:02 pm – 2:14 pm

7
Contemporary Intermittent Claudication Treatment Patterns in the Commercially Insured Non-Medicare Population
Jeffrey J. Siracuse[1], Jonathan Woodson[1], Randall P. Ellis[2], Alik Farber[1], Sean P. Roddy[3], Scott R. Levin[1], Jayakanth Srinivasan[4] - [1]Boston University School of Medicine, Boston, MA; [2]Boston University, Department of Economics, Boston, MA; [3]Albany Medical Center, Albany, NY; [4]Boston University, Questrom School of Business, Boston, MA

2:14 pm – 2:26 pm

8 ♦
Effects of Dual Antiplatelet Therapy on Graft Patency after Lower Extremity Bypass
Nathan Belkin, Jordan Stoecker, Benjamin M. Jackson, Scott M. Damrauer, Julia D. Glaser, Venkat Kalapatapu, Grace J. Wang - Hospital of the University of Pennsylvania, Philadelphia, PA

2:26 pm – 2:38 pm

9 ♦
The Role of Transfemoral Carotid Artery Stenting with Proximal Balloon Occlusion Embolic Protection in the Contemporary Endovascular Management of Carotid Artery Stenosis
Patric Liang[1], Peter Soden[1], Mark C. Wyers[1], Mahmoud B. Malas[2], Brian W. Nolan[3], Grace J. Wang[4], Richard J. Powell[5], Marc L. Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of California San Diego, La Jolla, CA; [3]Maine Medical Center, Portland, ME; [4]University of Pennsylvania, Philadelphia, PA; [5]Dartmouth-Hitchcock Medical Center, Lebanon, NH

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2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

2:38 pm – 2:50 pm

10 ♦
Simultaneous Treatment of Common Carotid Lesions Increases the Risk of Stroke and Death after Carotid Artery Stenting
Charles DeCarlo[1], Adam Tanious[1], Laura T Boitano[1], Jahan Mohebali[1], David H. Stone[2], W. Darrin Clouse[3], Mark F. Conrad[1] - [1]Massachusetts General Hospital, Boston, MA; [2]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [3]University of Virginia Health System, Charlottesville, VA

2:50 pm – 3:02 pm

11 ♦
Long-Term Outcomes of Flared Limbs in Aneurysmal Iliac Arteries
R. Clement Darling, III, Alexander Kryszuk, Nicholas Russo, Jeffrey Hnath - Albany Medical College, Albany, NY

3:05 pm – 4:34 pm

SCIENTIFIC SESSION III (Live)
(8-minute presentation / 4-minute Q & A)
Moderator: Jennifer Stableford, MD & Carla Moreira, MD

3:05 pm – 3:10 pm

Introduction from the Moderator

3:10 pm – 3:22 pm

12 ♦
Similar Five-Year Outcomes between Patients with and without Hostile Proximal Neck Anatomy Following Abdominal Aortic Aneurysm Repair with the Ovation Stent Graft Platform
Rens R.B. Varkevisser[1,2], Priya B. Patel[1], Nicholas J. Swerdlow[1], Chun Li[1], Hence J.M. Verhagen[2], Sean P. Lyden[3], Marc. L. Schermerhorn[1] – [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University Medical Center Rotterdam, The Netherlands; [3]Cleveland Clinic, Cleveland, OH

3:22 pm – 3:34 pm

13 (Video) ♦
Primary Venous Leiomyosarcoma Resection, IVC Reconstruction
Erion Qaja, Edward Gifford, Oscar Serrano - UConn/Hartford Hospital, Hartford, CT

3:34 pm – 3:46 pm

14 ♦
Transcarotid Artery Revascularization Versus Carotid Endarterectomy and Transfemoral Stenting in Octogenarians
Ambar Mehta[1], Priya Patel[2], Danielle Bajakian[1], Richard Schutzer[1], Nicholas Morrissey[1], Karan Garg[3], Mahmoud Malas[4], Marc Schermerhorn[5], Virendra I. Patel[1] - [1]Columbia University Irving Medical Center, New York, NY; [2]Rutgers New Jersey Medical School, Newark, NJ; [3]New York University School of Medicine, New York, NY; [4]University of California San Diego Health, San Diego, CA; [5]Beth Israel Deaconess Medical Center, Boston, MA

3:46 pm – 3:58 pm

15 ♦
The Effect of Thoracoabdominal Aortic Aneurysm Extent on Outcomes in Patients Undergoing Fenestrated/Branched Endovascular Aortic Repair
Kyle R. Diamond, Jessica P. Simons, Allison S. Crawford, Edward J. Arous, Dejah R. Judelson, Francesco A. Aiello, Douglas W. Jones, Louis Messina, Andres Schanzer - UMass Memorial Medical Center, Worcester, MA

3:58 pm – 4:10 pm

16 (Video)
3-Vessel Fenestrated Repair of 6cm Thoracoabdominal Aortic Aneurysm after a Chronic Type B Dissection
Mohammad Alqaim - UMASS Memorial Medical Center, Worcester, MA

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4:10 pm – 4:22 pm

17
Stress Testing Prior to Abdominal Aortic Aneurysm Repair Does Not Prevent Postoperative Cardiac Events
Jesse A. Columbo, Zachary J. Wanken, Daniel B. Walsh, Bjoern D. Suckow, Jocelyn M. Beach, Stanislav Henkin, Philip P. Goodney, David H. Stone - Dartmouth-Hitchcock Medical Center, Lebanon, NH

4:22 pm – 4:34 pm

18
A Multicenter, Prospective Randomized Trial of Negative Pressure Wound Therapy for Infrainguinal Revascularization Groin Incisions
Daniel Bertges[1], Lisa Smith[1], Rebecca Scully[2], Mark Wyers[3], Jens Eldrup-Jorgenson[4], Bjoern Suckow[5], C. Keith Ozaki[2], Louis Nguyen[2] - [1]University of Vermont Medical Center, Burlington, VT; [2]Brigham and Women's Hospital, Boston, MA; [3]Beth Israel Deaconess Medical Center, Boston, MA; [4]Maine Medical Center, Portland, ME; [5]Dartmouth Hitchcock Medical Center, Lebanon, NH

4:45 pm – 5:00 pm

INTRODUCTION OF THE PRESIDENT (Live)
Palma Shaw, MD
SUNY Upstate Medical Center, Syracuse, NY

5:00 pm – 5:30 pm

PRESIDENTIAL ADDRESS (Live)
Rise to the Challenge
Marc Schermerhorn, MD
Beth Israel Deaconess Medical Center, Boston, MA

SATURDAY, SEPTEMBER 12, 2020

7:30 am – 7:55 am

ANNUAL MEMBER BUSINESS MEETING (Members Only)

- Society Updates
- Vote—Bylaw Amendments
- Vote—New Members
- Proposed Slate (2020-2021)
- Introduction of the Incoming President, Dr. Alan Dardik

8:00 am – 8:25 am

INDUSTRY SPONSORED SYMPOSIUM #3 (Live)
Shockwave IVL for Calcified BTK, CFA and Iliac Disease
Paul Bloch, MD, Matthew Alef, MD & Nathan Aranson, MD

Presented by: Shockwave Medical

8:30 am – 8:55 am

INDUSTRY SPONSORED SYMPOSIUM #4 (Live)
GORE® EXCLUDER® Conformable AAA Endoprosthesis: Clinical Trial Update and Early Experience
Robert Rhee, MD

Presented by: W. L. Gore

9:00 am – 9:55 am

SCIENTIFIC SESSION IV – RAPID FIRE PAPERS (Live)
(3-minute presentation / 2-minute Q & A)
Moderators: Palma Shaw, MD & Alan Dardik, MD, PhD

9:00 am – 9:05 am

Introduction from the Moderator

2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

9:05 am – 9:10 am	19 (RF) **Off Label Use of EVAR Devices is Associated with Adverse Outcomes and Should Be Avoided** Thomas FX O'Donnell, Laura T. Boitano, Jahan Mohebali, Glenn M. LaMuraglia, Christopher J. Kwolek, Mark F. Conrad - Massachusetts General Hospital, Boston, MA
9:10 am – 9:15 am	20 (RF) **Long-Term Tunneled Dialysis Catheters Use is Not Associated with Mortality but is Associated with Increased Morbidity** Victor K. Castro, Alik Farber, Yixin Zhang, Quinten Dicken, Logan Mendez, Scott R. Levin, Thomas W. Cheng, Rebecca B. Hasley, Jeffrey J. Siracuse - Boston University School of Medicine, Boston, MA
9:15 am – 9:20 am	21 (RF) **Comparative Analysis of Open Abdominal Aortic Aneurysm Repair Outcomes Across National Registries** Rebecca E. Scully, Gaurav Sharma, Andrew J. Soo Hoo, Jillian Walsh, Ginger Jin, Matthew T. Menard, Charles Keith Ozaki, Michael Belkin - Brigham and Women's Hospital, Boston, MA
9:20 am – 9:25 am	22 (RF) **Occupational and Patient Radiation Dose Reduction with a Reduced Frame Rate and Roentgen Protocol Utilizing Fixed Imaging** Alex M. Lin, Amanda C. Methe, Vincent R. Narvaez, Matthew Kronick, Volodymyr Labinskyy, Marc A. Norris, Amanda Kravetz, Avery Y. Ching, Neal C. Hadro, Marvin E. Morris - Baystate Medical Center, Springfield, MA
9:25 am – 9:30 am	23 (RF) **Short and Long-Term Outcomes after Concurrent Splenectomy for Thoracoabdominal Aortic Aneurysm Repair** Christopher A. Latz, Laura T. Boitano, Charles DeCarlo, Zach Feldman, Maximilian Png, Jahan Mohebali, Anahita Dua, Mark F. Conrad - Massachusetts General Hospital, Boston, MA
9:30 am – 9:35 am	24 (RF) **Trends in General Surgery Operative Experience for the Integrated Vascular Surgery Resident** Emily Fan, Allison Crawford, Edward J. Arous, Dejah R. Judelson, Francesco Aiello, Andres Schanzer, Jessica Simons - University of Massachusetts, Worcester, MA
9:35 am – 9:40 am	25 (RF) **Characteristics and Outcomes of Ruptured Abdominal Aortic Aneurysms Below the Size Threshold for Elective Repair** Kirthi Bellamkonda, Naiem Nassiri, Mehran M. Sadeghi, Yawei Zhang, Raul Guzman, Cassius I. Ochoa Chaar - Yale School of Medicine, New Haven, CT
9:40 am – 9:45 am	26 (RF) **Six-Year Outcomes of the Endologix AFX1 Endovascular AAA System: A Single Center Experience** Truc M. Ta, Nathan J. Aranson, Michael P. Bianco, Amy L. Fournier, Elizabeth A. Blazick, Kimberly T. Malka, Robert E. Hawkins, Paul H.S. Bloch, Brian W. Nolan - Maine Medical Center, Portland, ME

2020 ANNUAL MEETING SCHEDULE-AT-A-GLANCE

9:45 am – 9:50 am	27 (RF) **Procedure-Associated Costs and Mid-Term Outcomes of Endovascular Zone 0 and Zone 1 Aortic Arch Repair** Jonathan Aaron Barnes, Zachary J. Wanken, Jesse A. Columbo, David P. Kuwayama, Mark F. Fillinger, Bjoern D. Suckow - Dartmouth-Hitchcock Medical Center, Lebanon, NH
9:50 am – 9:55 am	28 (RF) **Patients Undergoing Interventions for Intermittent Claudication in States that Increased Cigarette Tax are Less Likely to Actively Smoke** Scott R. Levin[1], Summer S. Hawkins[2], Alik Farber[1], Philip P. Goodney[3], Nicholas H. Osborne[4], Tze-Woei Tan[5], Jeffrey J. Siracuse[1] - [1]Boston University School of Medicine, Boston, MA; [2]Boston College, Chestnut Hill, MA; [3]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [4]University of Michigan, Ann Arbor, MI; [5]University of Arizona, Tucson, AZ
10:00 am – 10:25 am	**INDUSTRY SPONSORED SYMPOSIUM #5** (Live) **Unconscious Bias** Jean Starr, MD, Naiem Nassiri, MD & Elizabeth Blazick, MD Presented by: Medtronic
10:30 am – 10:35 am	**AWARD ANNOUNCEMENT** • Deterling Award Winner • Darling Award Winner
10:35 am – 10:45 am	**CLOSING REMARKS FROM INCOMING PRESIDENT** Alan Dardik, MD, PhD Yale University School of Medicine New Haven, CT
10:45 am	Adjourn

2020 ANNUAL MEETING ABSTRACTS

FRIDAY, SEPTEMBER 11, 2020

8:00 am **POSTGRADUATE COURSE**
(Separate Subscription)

Practical Technical Tips—How I Do It
Moderators: C. Keith Ozaki, MD & Rebecca Scully, MD

8:00 am Welcome

8:05 am PG1
Endovascular Carotid Artery Interventions Including TCAR
Palma Shaw, MD
SUNY Upstate Medical Center, Syracuse, NY

8:15 am PG2
Eversion Carotid Artery Endarterectomy
Courtney Warner, MD
Albany Med Vascular Surgery, Albany, NY

8:25 am PG3
Carotid Artery Endarterectomy Under Regional Anesthetic
Jennifer A. Stableford, MD
Dartmouth-Hitchcock Medical Center, Lebanon, NH

8:35 am PG4
Percutaneous Venous Ablation
Julianne Stoughton, MD
Massachusetts General Hospital, Boston, MA

8:50 am PG5
Acute DVT Thrombolysis
Britt Tonnessen, MD
Yale Vascular Surgery, New Haven, CT

9:00 am PG6
Fenestrated Aortic Endografts
Jessica Simons, MD
University of Massachusetts, Worcester, MA

9:15 am Group Q & A (Speakers 1-6) (Live)

9:25 am PG7
Open Thoraco-Abdominal Aortic Aneurysm Repair
Sunita Srivastava, MD
Massachusetts General Hospital, Boston, MA

9:40 am PG8
Tibial Endovascular Interventions
Anahita Dua, MD
Massachusetts General Hospital, Boston, MA

9:55 am PG9
Pedal/Plantar Loop Reconstruction for CLTI
Carla C. Moreira, MD
Alpert Medical School of Brown University, Providence, RI

10:05 am PG10
Femoral-Tibial Bypass
Elizabeth Blazick, MD
Maine Medical Center, Portland, ME

10:20 am PG11
Percutaneous Hemodialysis Access Creation, Maintenance and Salvage
Dejah Judelson, MD
University of Massachusetts, Worcester, MA

10:30 am PG12
Anterior Spine Exposures
Christine Lotto, MD
Capital Health Hospital, Pennington, NJ

10:40 am Group Q & A (Speakers 7-12) (Live)

10:50 am Break

11:00 am **SCIENTIFIC SESSION I** (Live)
(8-minute presentation / 4-minute Q & A)
Moderators: Marc Schermerhorn, MD & Andres Schanzer, MD

11:00 am Introduction from the Moderator

11:05 am 1♦
Intraoperative EEG Changes During TCAR are More Frequent than Previously Reported
Laura C. Lamb, Edward Gifford, Parth Shah, Ilene Staff, Akhilesh Jain, James Gallagher, Gaurav Rana, Thomas Divinagracia - Hartford Healthcare, Hartford, CT

OBJECTIVE: Up to 14% of patients undergoing carotid endarterectomy (CEA) with continuous electroencephalographic (EEG) neuromonitoring require shunt placement due to EEG changes. Initial studies of transcarotid artery revascularization (TCAR) found only one patient with temporary EEG changes. We report our experience with intraoperative EEG monitoring during TCAR.

METHODS: We conducted a retrospective review of patients from May 2017 to January 2020 who received TCAR at two urban hospitals within an integrated healthcare network. Data included demographic information, patient comorbidities, symptom status, prior carotid interventions, anatomic details, contralateral disease, intra-operative vital signs and EEG changes, and post-operative major adverse events (transient ischemic attack (TIA), stroke, myocardial infarction (MI), and death) both initially and 30 days post-operatively. Fisher's Exact test was used for categorical data, while continuous data was analyzed with Wilcoxon Rank Sum.

RESULTS: A total of 89 patients underwent TCAR during the study period, of which 71 (79.8%) had intraoperative EEG neuromonitoring. 70.8% of patients were male. Median age was 75 years (IQR 68-82.5). Symptomatic patients accounted for 41.6% of the cohort. Of the 71 patients who had continuous neuromonitoring, nine had EEG changes during TCAR (12.7%). Changes resolved in 7 patients with pressure augmentation (2), low flow toggle (2), and unclamping after completing flow reversal (3). One patient who had sustained EEG changes had a new post-operative neurologic deficit. Median carotid stenosis percentage on pre-operative CT angiography was lower for patients with EEG changes than those without (67% vs 80%, p=0.009). Neither symptomatic carotid stenosis nor 30-day events were associated with EEG changes during TCAR (p=0.49 and p =0.57 respectively). Overall, there were three post-operative strokes, two post-operative deaths, and one myocardial infarction, for a 30-day stroke/death/MI rate of 7.9%.

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CONCLUSION: Changes in continuous EEG were more frequent in our study than previously reported. Less severe carotid stenosis may be associated with a higher incidence of EEG changes. There is limited data on the prognostic ability of EEG to detect clinically relevant changes during TCAR, and further study is warranted.

DISCLOSURES: L.C. Lamb: None; E. Gifford: Intact Vascular; P. Shah: None; I. Staff: None; A. Jain: Cook Medical; J. Gallagher: None; G. Rana: None; T. Divinagracia: Silk Road Medical

11:17 am 2 ♦

Natural History of Late Type 1a Endoleaks

Thomas FX O'Donnell, Jahan Mohebali, Laura T. Boitano, Glenn M. LaMuraglia, Christopher J. Kwolek, Mark F. Conrad - Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Although early Type 1A endoleaks are well described, late appearing proximal endoleaks are less understood.

METHODS: All patients who underwent elective EVAR without prior aortic surgery at a single institution from 2010-2018 were studied. Only Type 1A endoleaks diagnosed on postoperative CT scans were considered, not completion angiograms. Late endoleaks were defined as those appearing after one year. We used Cox regression to study factors associated with late Type 1A endoleaks.

RESULTS: There were 477 patients who underwent EVAR, of whom 411 (86%) had adequate follow-up. There were 24 Type 1A endoleaks, 4 early and 20 late. The freedom from Type 1A endoleaks was 99%, 92% and 81% at 1, 5 and 8 years with a median time to occurrence of 2.5 years (3 days to 8.2 years). Only 40% of patients with Type 1A endoleaks were treated within the initial graft Instructions for Use (IFU). Although 75% of the early Type 1A endoleaks appeared on completion angiogram, only 10% of patients with a late Type 1A had a proximal endoleak on completion angiogram, and 60% had no endoleak at the completion of the index case. Only 21% of late Type 1As were evident by one year, but 79% had stable or expanding sacs. Twelve (60%) of late Type 1A endoleaks had prior interventions for other endoleaks, mostly Type 2 (10/12). Age (HR 1.07 per year [1.02-1.12], P=.01), neck diameter >28mm (HR 3.5[1.2-10.3],P=.02), neck length<20mm (HR 3.0[1.1-8.6],P=.04), and neck angle>60 degrees (HR 3.4[1.5-7.9],P=.004) were all independently associated with higher rates of Type 1A endoleak, but not female sex, endograft, or the use of suprarenal fixation. Two patients had proximal degeneration and 5 experienced graft migration. There were two ruptures (10%), and 14 patients underwent repair (5 open, 9 endovascular), 3 of whom underwent multiple interventions. Median survival after late Type 1A repair was 6.6 years (0 to 8.4 years).

CONCLUSIONS: Late appearing Type 1A endoleaks have a high rate of rupture and present significant diagnostic and management challenges. Careful follow-up is needed, especially in patients with hostile neck anatomy and those undergoing intervention for other endoleaks.

DISCLOSURES: T.F. O'Donnell: None; J. Mohebali: None; L.T. Boitano: None; G.M. LaMuraglia: None; C.J. Kwolek: None; M.F. Conrad: None

11:29 am 3

A Significant Proportion of Current United States EVAR Practice Fails to Meet SVS Clinical Practice Guideline Recommended AAA Diameter Treatment Thresholds

Salvatore T. Scali[1], Bjoern D. Suckow[2], Philip P. Goodney[2], Thomas S. Huber[1], Gilbert R. Upchurch, Jr.[1], Dan Neal[1], Jesse A. Columbo[2], Jeanwan Kang[2], Marc L. Schermerhorn[3], Richard J. Powell[2], David H. Stone[2] - [1]University of Florida, Gainesville, FL; [2]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [3]Beth Israel Deaconess Medical Center, Boston, MA

INTRODUCTION AND OBJECTIVES: There is mounting controversy surrounding the appropriate use of EVAR in contemporary practice. Persistent debate hinges on durability, cost and survival. Accordingly, guidelines have attempted to clarify appropriate EVAR indications. The purpose of this analysis was to examine trends in EVAR practice throughout the United States and measure compliance with SVS clinical practice diameter guidelines (CPGs).

METHODS: We analyzed all elective repairs in the SVS-VQI EVAR registry from 2015-2019(N=25,112) and included patients with aneurysms confined to the infrarenal abdominal aorta. Center and surgeon variation with CPG diameter compliance was examined. Using logistic regression for risk-adjustment, patients were stratified into predicted 1-year mortality risk tertiles and comparisons were made between subjects meeting diameter guidelines (men $\geq$5.5; women $\geq$5.0cm) and those who did not.

RESULTS: Non-compliant EVAR occurred in 38.5% (N=9,675; Compliant-61.5%, N=15,437). There was significant variation in guideline compliance when stratified by VQI participating centers (range 21%-95% [median 61%]; P<.001). This observation was amplified when categorized at the surgeon level (range 0-100% [median 63%]; P<.0001) (Figure). Notably, 82% of VQI surgeons (N=852 of 1048) remain non-compliant in over 20% of their repairs. Moreover, among the 38.5% of patients failing to meet CPG diameter thresholds, 25.4%(N=2,462) were high-physiologic risk as determined by the validated SVS-VQI 1-year mortality calculator. Notably, 1-year survival for the high-physiologic risk patients receiving non-guideline compliant EVAR was worse compared to subjects treated within recommended CPGs (89±2% vs. 94±1%; log-rank P=.0003).

CONCLUSIONS: A significant percentage of current U.S. EVAR practice fails to adhere to SVS diameter guidelines, as highlighted by the tremendous variation among VQI centers and surgeons. Furthermore, as noted by the 25% of patients receiving non-compliant repair deemed to be high physiologic risk, patient selection for EVAR appears suboptimal. Surprisingly, these findings are observed among the majority of VQI surgeons performing EVAR. In light of issues surrounding durability and cost, efforts to constrain observed deviation from recommended therapeutic guidelines would likely serve to improve AAA care throughout the United States.

Figure. Variation in Rates of EVAR Guideline Compliance for Elective AAA by VQI Center and Surgeon

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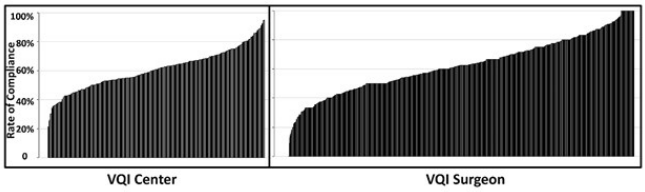
Figure. Variation in Rates of EVAR Guideline Compliance for Elective AAA by VQI Center and Surgeon



DISCLOSURES: S.T. Scali: None; B.D. Suckow: None; P.P. Goodney: None; T.S. Huber: None; G.R. Upchurch, Jr.: None; D. Neal: None; J.A. Columbo: None; J. Kang: None; M.L. Schermerhorn: None; R.J. Powell: None; D.H. Stone: None

11:41 am

4 ♦

The Impact of Completion and Follow-Up Endoleaks on Survival, Reintervention and Rupture

Chun Li[1], Livia de Guerre[1], Kirsten Dansey[1], Jinny Lu[1], Priya B. Patel[1], Mahmoud B. Malas[2], Douglas W. Jones[4], Marc L. Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of California San Diego Health System, San Diego, CA; [3]Boston Medical Center, Boston, MA; [4]UMASS Memorial Medical Center, Worcester, MA

INTRODUCTION AND OBJECTIVES: Literature on endoleaks focuses on outcomes after completion endoleaks, but data evaluating the effect of follow-up endoleaks on long-term outcomes is lacking.

METHODS: We reviewed patients who underwent EVAR from 2003 to 2019 within the VQI-Medicare database and identified patients with endoleak at procedure completion and follow-up. We stratified cohorts by presence of completion and follow-up endoleak subtypes. The primary outcome was 5-year survival, and secondary outcomes included freedom-from-reintervention and freedom-from-rupture. We used Kaplan-Meier estimates and log-rank tests to analyze rate differences.

RESULTS: Of 22,912 patients with completion endoleak data, 5,296 (23%) had an endoleak. Compared to those without endoleak, those with type I endoleaks had lower survival (75% vs. 80%, P<.001), type II endoleaks had higher survival (84%, P<.001), and types III, IV and indeterminate were not statistically different (82%, 89%, 79%, respectively). Freedom-from-reintervention for types I and III endoleaks were significantly lower than no endoleak cohort (I: 76%, P<.001; III: 65%, P<.001, vs. 82%), but freedom-from-rupture was higher for those with type II endoleak (94% vs. 92%, P<.001) (Figure 1a,b,c).Of 14,873 patients with follow-up endoleak data, 2,373 (16%) had an endoleak. Compared to those without endoleak, types I and III had significantly lower survival (I: 84%, P<.001; III: 67%, P<.001 vs. 88%), but there were no differences for types II (86%) and indeterminate (86%). Those with any type of follow-up endoleak had lower freedom-from-reintervention (I: 70%, P<.001; II: 76%, P<.001; III: 34%, P<.001; indeterminate: 54%, P=.01 vs. 84%), and lower freedom-from-rupture (I: 91%, P=.003; II: 89%, P=.02; III: 85%, P<.001; indeterminate: 89%, P=.07 vs. 93%) (Figure 1d,e,f).

CONCLUSIONS: Compared to no endoleak patients, those with type I completion endoleaks have lower 5-year survival and freedom-from-reintervention. Patients with types I and III follow-up endoleaks also have lower survival, and any endoleak at follow-up is associated with lower freedom-from-reintervention and freedom-from-rupture. These data highlight the importance of close postoperative follow-up after EVAR, as the presence of endoleaks over time portends worse outcomes.

Figure 1A. KM Survival by Type of Completion Endoleak

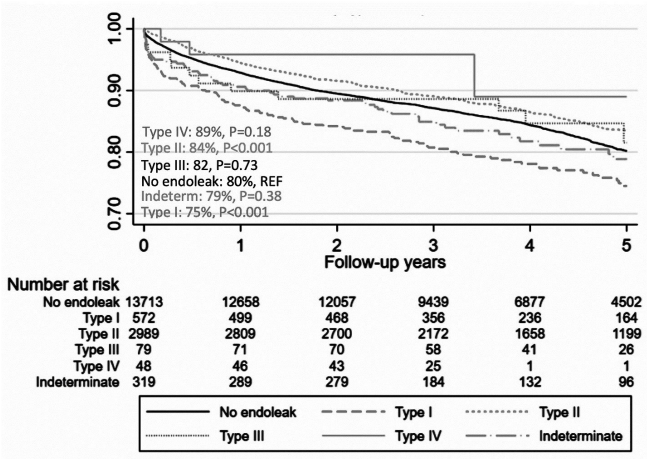


Figure 1B. Freedom from Reintervention by Completion Endoleak Type

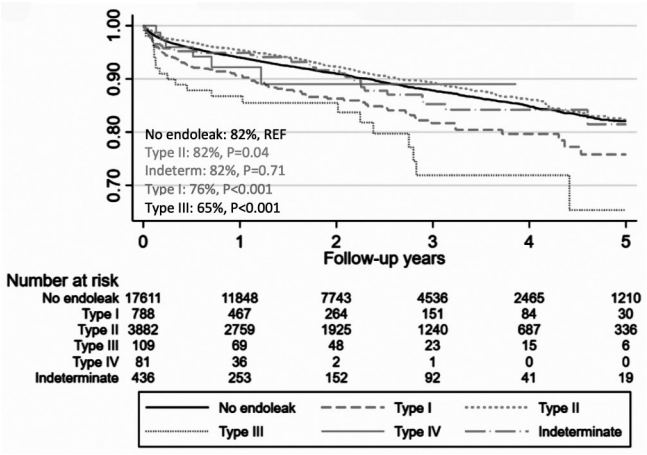


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Figure 1C. Freedom from Rupture by Completion Endoleak Type

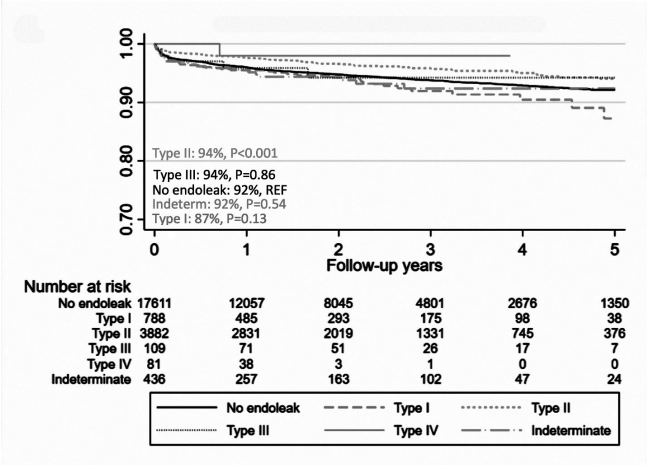


Figure 1D. KM Survival by Type of Follow-Up Endoleak

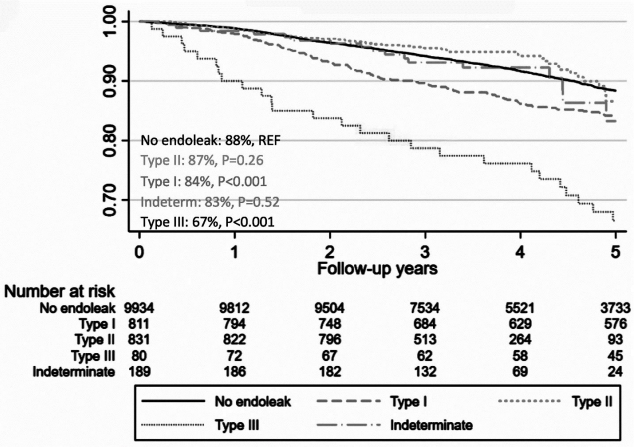


Figure 1E. Freedom from Reintervention by Follow-Up Endoleak Type

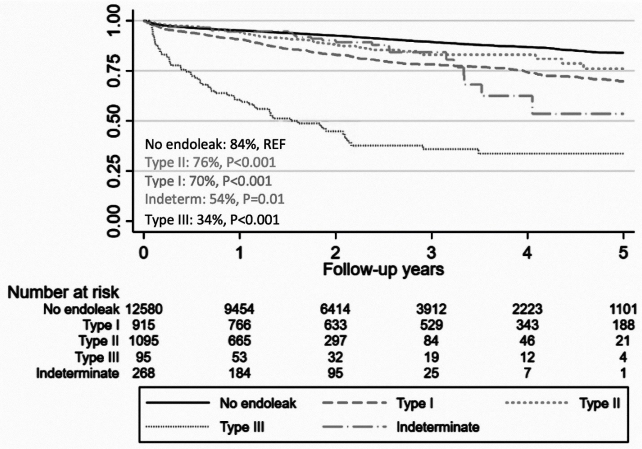
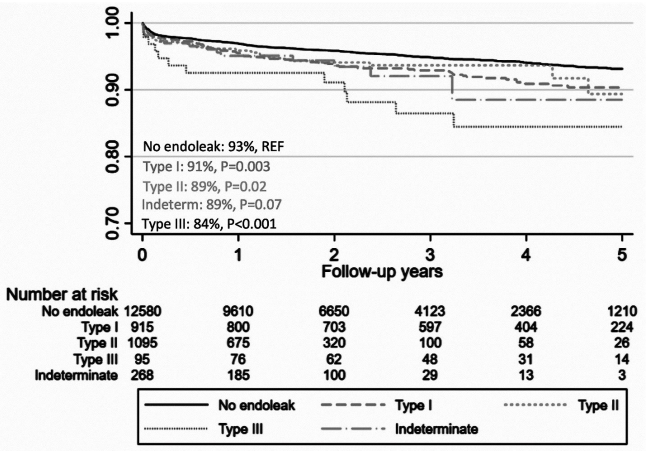


Figure 1F. Freedom from Rupture by Follow-Up Endoleak Type



DISCLOSURES: C. Li: None; L. de Guerre: None; K. Dansey: None; J. Lu: None; P.B. Patel: None; M.B. Malas: None; D.W. Jones: None; M.L. Schermerhorn: Abbott Laboratories, Cook Medical, Endologix, Medtronic, Philips

11:53 am 5

The Medical Resource Utilization and Financial Impact of Infection on Venous Leg Ulcers

Mark D. Iafrati[1], Raffi Melikian[2], Thomas F. O'Donnell, Jr.[1] - [1]Tufts Medical Center, Boston, MA; [2]Tufts Medical School, Boston, MA

INTRODUCTION AND OBJECTIVES: To determine in VLU patients, the impact of infection (INF) on medical resource utilization (MRU) and cost of care.

METHODS: We performed a retrospective case-controlled study of 78 patients followed a minimum of 12 months with VLUs treated by vascular surgeons, at our wound center. To eliminate minor episodes of INF or incorrectly diagnosed episodes, only patients who had an inpatient admission specifically for INF comprised the INF GROUP, while other admissions were excluded for this group. MRU was defined as: the number of clinic visits; visiting nurse (VNA) visits, and inpatient admissions. The cost for treatment was determined using financial data provided by the hospital and physician organization billing units. The cost over the 1 year follow up was comprised of individual cost centers: inpatient and outpatient facility fees, physician fees, and visiting nurse services. Mean MRU and cost data were compared using the two-sample t test between INF and NO-INF.

RESULTS: Of the 78 VLU patients 9 (11.5%) had at least one inpatient admission for INF related to their VLU in the 1-year treatment period, for a total of 14 admissions. Out of the 69 non-INF patients, only 3 had inpatient admissions. There was no difference between INF and NON-INF for age (66; 61.3 yrs.); % males (67; 57); DVT Hx (22%; 25%); and other risk factors, but INF had a greater proportion of CHF (44%; 13% , p = 0.02). MRU and cost data are shown in Tables 1 and 2.

CONCLUSIONS: Infections in VLU patients led to an increase in MRU and cost of care; with the INF cohort requiring more inpatient admissions, outpatient visits, and VNA services. Given the major impact INF has on cost and MRU, better treatment modalities that prevent infection as well as identifying risk factors for INF in VLU patients are needed.

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Table 1. Medical Resource Utilization Per Patient Over 1 Year of Care

	Infection Cohort (n=9)	No Infection Cohort (n=69)	P
Number of Impatient Admissions	1.56 +/- 0.73	0.04 +/- 0.21	**< 0.0001**
Number of Outpatient Wound Center Visits	16.89 +/- 6.41	9.46 +/- 7.77	**0.008**
Number of VNA Blocks	3.89 +/- 2.93	1.94 +/- 2.24	**0.02**

VNA, Visiting Nurse Association
Continuous variables are presented as mean +/- standard deviation. Boldface value indicates statistical significance.

Table 2. Total Cost of Care Per Patient Over 1 Year

	Infection Cohort (n=9)	No Infection Cohort (n=69)	P
Total Costs	$27,408 +/- 10,859	$11,088 +/- 9,343	**< 0.0001**
Inpatient Costs	$9,492 +/- 8, 328	$255 +/- 1,438	**<0.0001**
Outpatient Wound Center Costs	$7,961 +/- 9,575	$6,176 +/- 8.397	0.56
VNA Costs	$9,956 +/- 7,7650	$4,657 +/- 5,486	**0.01**

VNA, Visiting Nurse Association
Continuous variables are presented as mean +/- standard deviation. Boldface value indicates statistical significance.

DISCLOSURES: M.D. Iafrati: None; R. Melikian: None; T.F. O'Donnell: None

12:15 pm **INDUSTRY SPONSORED SYMPOSIUM #1** (Live)
Utility of a Disease-Specific Approach to TBAD—Real-World Application and Disease Management Strategies
Joseph Lombardi, MD

Presented by: Cook Medical

12:45 pm **INDUSTRY SPONSORED SYMPOSIUM #2** (Live)
The New Treo Abdominal Stent-Graft by Terumo Aortic—Introduction to the NESVS
Akhilesh K. Jain, MD, Michael Stoner, MD & Naiem Nassiri, MD

Presented by: Terumo Aortic

1:10 pm Break

1:45 pm **SCIENTIFIC SESSION II** (Live)
(8-minute presentation / 4-minute Q & A)
Moderator: Jessica Simons, MD & Kimberly Malka, MD

1:45 pm Introduction from the Moderator

1:50 pm 6 ♦
The Degree of Oversizing in Endovascular Aortic Aneurysm Repair
Livia de Guerre[1], Rens Varkevisser[1], Nicholas Swerdlow[1], Chun Li[1], Salvatore Scali[2], Virendra Patel[3], Joost van Herwaarden[4], Marc Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of Florida Health, Gainesville, FL; [3]Columbia University Irving Medical Center, New York, NY; [4]UMC Utrecht, Utrecht, Netherlands

INTRODUCTION AND OBJECTIVES: Although most manufacturers recommend a 10-20% degree of endograft oversizing, the optimal degree and impact of endograft oversizing remain unclear. Therefore, we examined the influence of the degree of endograft oversizing on mortality, late re-interventions and rupture rates after endovascular aneurysm repair.

METHODS: We identified patients undergoing elective EVAR between 2012 and 2016 in the Vascular Quality Initiative linked to Medicare claims for long-term outcomes. We calculated the degree of oversizing by dividing the endograft diameter by the pre-operative outer aortic wall diameter of the aneurysm neck and stratified oversizing into <10%, 10-20%, and >20%. Two -year reinterventions, rupture rates, and survival were assessed using Kaplan-Meier estimations.

RESULTS: We included 4,595 patients, 20% had oversizing below 10%, 34% between 10-20%, and 46% above 20%. Patients with oversizing above 20% were more often female (23% vs. 16%, P<.001), and more often had any hostile neck characteristic (39% vs. 28%, P<.001). Also, patients with oversizing below 10% were more likely to have any hostile neck characteristic (46% vs. 28%, P<.001). Patients with oversizing above 20% had higher two-year reintervention rates (7% vs. 6%, log-rank P=.03; HR:1.4, 95%CI:1.0-2.0, P=.038), and similar two-year ruptures (2.7% vs. 2.2%, log-rank P=.7) and survival (88% vs. 85%, Log-rank P=.88). Patients with oversizing below 10% had higher two-year reintervention rates (11.7% vs. 6%, Log-rank P=.02; HR:1.4, 95%CI:1.0-2.2, P=.05) and two-year ruptures (5.6% vs. 2.2%, Log-rank P=.004; HR:2.1, 95%CI:1.2-3.6, P=.009) and similar survival (85% vs. 85%, Log-rank P=.08 (Figure)

CONCLUSIONS: The higher rates of two-year reinterventions after oversizing above 20% and below 10% and the higher rates of two-year ruptures after oversizing below 10% strengthen the importance of adherence to manufacturers' guidelines of oversizing between 10-20%.

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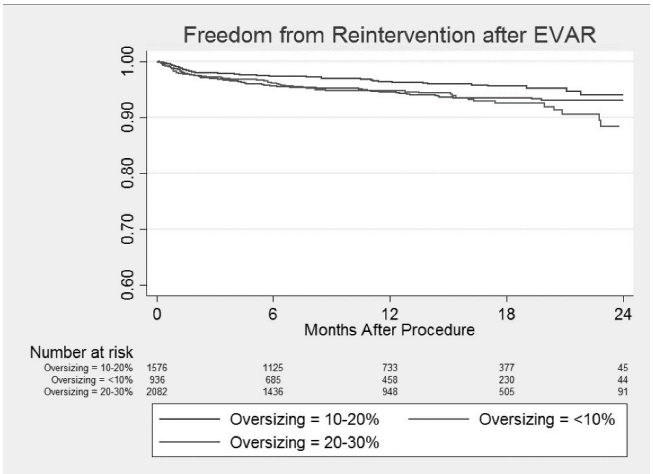
Figure. Freedom from Reintervention after EVAR



DISCLOSURES: L. de Guerre: None; R. Varkevisser: None; N. Swerdlow: None; C. Li: None; S. Scali: None; V. Patel: None; J. van Herwaarden: Philips, Abbott Vascular, Gore, Medtronic, Terumo Aortic; M. Schermerhorn: Abbott Vascular, Cook Medical, Endologix, Medtronic, Philips

2:02 pm 7

Contemporary Intermittent Claudication Treatment Patterns in the Commercially Insured Non-Medicare Population

Jeffrey J. Siracuse[1], Jonathan Woodson[1], Randall P. Ellis[2], Alik Farber[1], Sean P. Roddy[3], Scott R. Levin[1], Jayakanth Srinivasan[4] - [1]Boston University School of Medicine, Boston, MA; [2]Boston University, Department of Economics, Boston, MA; [3]Albany Medical Center, Albany, NY; [4]Boston University, Questrom School of Business, Boston, MA

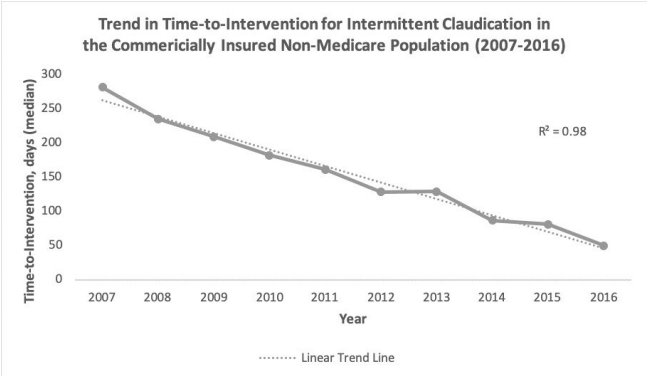
INTRODUCTION AND OBJECTIVES: The extent to which younger patients with intermittent claudication (IC) are offered guideline-recommended medical optimization and interventions, and whether this has changed over time with the expansion of endovascular treatments, is unclear. Our goal was to characterize contemporary IC treatment patterns in commercially insured non-Medicare patients.

METHODS: The IBM MarketScan database, comprising >8 billion U.S. commercial insurance claims, was queried for patients newly diagnosed with IC (2007-2016). Patient demographics, medication profiles, and interventions were evaluated. Time trends were modeled using simple linear regression, andgoodness-of-fit was assessed with coefficients of determination (R^2).

RESULTS: Among 152,935,013 unique patients, 300,590 (.2%) were newly diagnosed with IC. Mean insurance coverage was 4.4 years. Median age was 58 years and 56% of patients were male. Medical therapy included statins in 46% and cilostazol in 0.3% during the coverage period. Interventions were performed in 14.3%. Among these patients, 20% and 6% underwent 2 and $\geq$ 3 interventions, respectively. Median time from initial diagnosis to intervention decreased from 281 days in 2007 to 49 days in 2016 (linear regression R^2=.98) (Figure). Furthermore, in 2007, 68.3% of patients underwent interventions <6 months after diagnosis, rising to 94.8% in 2016 (linear regression R^2=.91). There were 16,406 inpatient and 97,742 outpatient interventions. Inpatient interventions (34% endovascular and 66% open surgical) decreased from 2,219 to 548 per year over the study period (linear regression R^2=.88). Atherectomy prevalence among outpatient interventions increased over the same time period from 11% to 29% (linear regression R^2=.94). Atherectomy prevalence among inpatient interventions remained stable at 12.2%. Tibial interventions were performed in 8.1% and 7.8% of outpatient and inpatient endovascular procedures, respectively.

CONCLUSIONS: Younger commercially insured patients with newly diagnosed IC are receiving aggressive treatment with multiple interventions and decreasing time to intervention. Interventions performed in the inpatient setting are decreasing. Outpatient, but not inpatient, procedures are increasingly utilizing atherectomy. Both inpatient and outpatient interventionists are performing interventions of unclear clinical benefit and sub-optimally prescribing statin therapy.

Figure. Trend in Time-to-Intervention for Intermittent Claudication in the Commercially Insured Non-Medicare Population (2007-2016)



DISCLOSURES: J.J. Siracuse: Grants # R01 HS026485-01; J. Woodson: None; R.P. Ellis: Grant # R01 HS026485-01; A. Farber: None; S.P. Roddy: None; S.R. Levin: None; J. Srinivasan: Grant # R01 HS026485-01

2:14 pm 8 ♦

Effects of Dual Antiplatelet Therapy on Graft Patency after Lower Extremity Bypass

Nathan Belkin, Jordan Stoecker, Benjamin M. Jackson, Scott M. Damrauer, Julia D. Glaser, Venkat Kalapatapu, Grace J. Wang - Hospital of the University of Pennsylvania, Philadelphia, PA

INTRODUCTION AND OBJECTIVES: The objective of this study was to explore prescribing patterns of single versus dual antiplatelet therapy (DAPT) after lower extremity bypass surgery, and to investigate the effects of antiplatelet therapy on bypass graft patency.

METHODS: A retrospective review of non-emergent infrainguinal lower extremity bypass operations entered in the national Vascular Quality Initiative (2003-2018) was performed. Patients discharged on aspirin monotherapy or DAPT were identified. Multivariable Cox regression investigated predictors of primary, primary-assisted, and secondary patency.

RESULTS: Of the 13,020 patients investigated, 52.2% were discharged on aspirin monotherapy, and 47.8% on DAPT. The proportion of patients discharged on DAPT increased from 10.6% in 2003 to 60.6% in 2018 (P<0.001). The DAPT cohort was younger, had higher rates of medical (HTN, diabetes, CHF, COPD) and atherosclerotic (CAD, prior CABG, prior lower extremity intervention)

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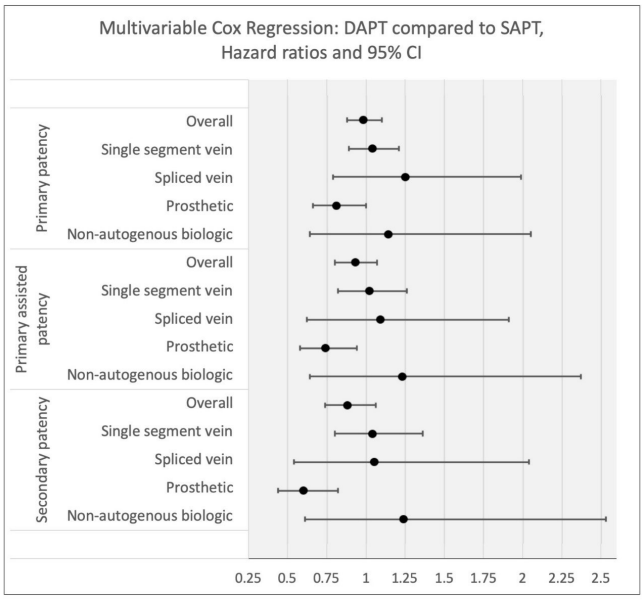
comorbidities, and had higher risk bypass procedures (more distal targets, prior inflow bypass procedure, prosthetic conduit utilization). Multivariable cox regression analysis did not show any difference between the DAPT and aspirin cohorts in primary patency (HR 0.98, 95% CI 0.88-1.10, P=0.78), primary assisted patency (HR 0.93, 95% CI 0.80-1.07, P=0.30) or secondary patency (HR 0.88, 95% CI 0.74-1.06, P=0.18). On subgroup analysis delineated by bypass conduit, DAPT was found to have a protective effect on patency only in the prosthetic bypass cohort: primary patency (HR 0.81, 95% CI 0.66-1.00, P=0.05), primary assisted patency (HR 0.74, 95% CI 0.58-0.94, P=0.01), and secondary patency (HR 0.60, 95% CI 0.44-0.82, P<.001). No patency differences were observed on adjusted subgroup analysis for the other conduits. (Figure)

CONCLUSIONS: A significant and increasing proportion of patients are discharged on dual antiplatelet therapy after lower extremity bypass revascularization. These patients represent a higher risk cohort with more medical comorbidities and higher risk bypass features. After controlling for these differences, DAPT therapy had no beneficial effect on overall bypass graft patency or major adverse limb events. However, on subgroup analysis, DAPT was associated with improved bypass graft patency in patients receiving prosthetic bypass conduits.

Figure. Multivariable Cox Regression: DAPT Compared to SAPT, Hazard Ratios and 95% CI



DISCLOSURES: N. Belkin: None; J. Stoecker: None; B.M. Jackson: None; S.M. Damrauer: None; J.D. Glaser: None; V. Kalapatapu: None; G.J. Wang: None

2:26 pm

9 ♦

The Role of Transfemoral Carotid Artery Stenting with Proximal Balloon Occlusion Embolic Protection in the Contemporary Endovascular Management of Carotid Artery Stenosis

Patric Liang[1], Peter Soden[1], Mark C. Wyers[1], Mahmoud B. Malas[2], Brian W. Nolan[3], Grace J. Wang[4], Richard J. Powell[5], Marc L. Schermerhorn[1] - [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University of California San Diego, La Jolla, CA; [3]Maine Medical Center, Portland, ME; [4]University of Pennsylvania, Philadelphia, PA; [5]Dartmouth-Hitchcock Medical Center, Lebanon, NH

INTRODUCTION AND OBJECTIVES: Transcarotid artery revascularization (TCAR) with flow reversal provides a superior method of embolic protection compared with transfemoral carotid artery stenting (tfCAS) with distal embolic protection. Flow reversal or flow arrest systems with proximal endovascular balloon occlusion can also be utilized via the transfemoral approach; however, their outcomes compared with TCAR with flow reversal and tfCAS with distal embolic protection are poorly described.

METHODS: We performed a retrospective review of all patients undergoing tfCAS with proximal balloon occlusion, tfCAS with distal embolic protection, and TCAR with flow reversal in the SVS-VQI from March 2005 to May 2019. We assessed in-hospital outcomes using propensity-score-matched cohorts of patients, utilizing tfCAS with proximal balloon occlusion as the comparison cohort. The primary outcome was stroke or death.

RESULTS: Of the 24,232 patients undergoing CAS, 561 (2.3%) were performed via tfCAS with proximal balloon occlusion, 18,126 (74%) via tfCAS with distal embolic protection, and 5,545 (22.9%) via TCAR with flow reversal. After matching, 464 pairs of patients undergoing tfCAS with proximal balloon occlusion and tfCAS with distal embolic protection were identified. There were no differences in stroke or death (proximal balloon 3.2% vs distal embolic protection 3.7%, RR 0.88 [95%CI 0.45-1.73]; P = .73), stroke (2.4% vs 2.6%, RR 0.92 [95%CI 0.42-2.00]; P = .83), or death (1.1% vs 1.5%, RR 0.71 [95% CI 0.41-3.15]; P = .80). However, after matching 357 pairs of patients undergoing tfCAS with proximal balloon occlusion and TCAR with flow reversal, tfCAS with proximal balloon occlusion was associated with higher rates of stroke or death (3.1% vs 0.8%, RR 3.67 [95%CI 1.02-13.14]; P = .03), and a trend towards higher rates of stroke (2.5% vs 0.8%, RR 3.00 [95%CI 0.81-11.08]; P = .08) and death (0.8% vs 0.0%, P = .08) (Table).

CONCLUSIONS: TfCAS with proximal balloon occlusion does not offer the same degree of embolic protection compared with TCAR with flow reversal given the significantly higher risk of perioperative stroke or death.

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Table. In-Hospital Perioperative Outcomes for Patients Undergoing Transfemoral Carotid Artery Stenting with Proximal Balloon Occlusion versus Transcarotid Artery Revascularization with Flow Reversal in a Propensity Score-Matched Study Population

	TCAR w/ flow reversal (n=357)	tfCAS w/ Proximal Balloon Occlusion (n=357)	Relative Risk (95% CI)	P-Value
Primary Outcome				
Stroke or Death	3 (0.8%)	11 (3.1%)	3.67 (1.02-13.14)	.03
Secondary Outcomes				
Stroke	3 (0.8%)	9 (2.5%)	3.00 (0.81-11.08)	.08
Transient Ischemic Attack	3 (0.8%)	3 (0.8%)	1.00 (0.20-4.95)	>.99
Death	0 (0.0%)	3 (0.8%)	---	.08
Myocardial Infraction	1 (0.3%)	2 (0.6%)	2.00 (0.18-22.06)	.56
Exploratory Outcomes				
Congestive Heart Failure	1 (0.3%)	3 (0.8%)	3.00 (0.31-28.84)	.32
Hemodynamic Instability				
Hypotensive	48 (15.0%)	55 (17.2%)	1.11 (0.77-1.61)	.57
Hypertensive	42 (13.3%)	40 (13.1%)	1.00 (0.65-1.54)	>.99
Reperfusion Syndrome	1 (0.3%)	1 (0.3%)	1.00 (0.06-15.99)	>.99
Procedure Time, mean (SD)	75.2 (36.1)	77.9 (39.6)	---	.71
Fluoroscopy Time, mean (SD)	6.0 (6.0)	15.0 (26.7)	---	<.001
Contrast volume, mean (SD)	36.6 (22.8)	73.4 (58.5)	---	<.001
Length of Stay, median (IQR)	1 (1, 1)	1 (1, 2)	---	.19
Failed CMS dis charge criteria	51 (14.3%)	68 (19.0%)	1.33 (0.96-1.85)	.08
Length of Stay >2 Days	46 (12.9%)	60 (16.8%)	1.30 (0.92-1.86)	.14
Failed Discharge Home	16 (4.5%)	33 (9.2%)	2.06 (1.15-3.70)	.01

Values are No. (%) unless otherwise specified. CI, confidence interval; TCAR, transcarotid artery revascularization; tfCAS, transfemoral carotid artery stenting; IQR, interqurtile range; SD, standard deviation.

DISCLOSURES: P. Liang: None; P. Soden: None; M.C. Wyers: None; M.B. Malas: Principal investigator for the CREST-2 and ROADSTERI and ROADSTERII trials, Proctor for TCAR; B.W. Nolan: None; G.J. Wang: None; R.J. Powell: None; M.L. Schermerhorn: Silk Road Medical, Abbott, Cook, Endologix, Medtronic, Philips

2:38 pm 10 ♦

Simultaneous Treatment of Common Carotid Lesions Increases the Risk of Stroke and Death after Carotid Artery Stenting

Charles DeCarlo[1], Adam Tanious[1], Laura T Boitano[1], Jahan Mohebali[1], David H. Stone[2], W. Darrin Clouse[3], Mark F. Conrad[1] -
[1]Massachusetts General Hospital, Boston, MA; [2]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [3]University of Virginia Health System, Charlottesville, VA

BACKGROUND: Tandem carotid artery lesions that involve simultaneous internal carotid artery (ICA) and common carotid artery (CCA) stenoses present a complex clinical problem. The addition of a retrograde proximal intervention to treat a CCA lesion during a carotid endarterectomy (CEA) increases the risk of stroke and death. However, the stroke and death risk associated with totally endovascular treatment of tandem lesions is unknown and is the subject of this study.

METHODS: VSGNE data for the years 2005-2020 were queried for carotid stenting procedures (CAS). Emergent and bilateral procedures, procedures for indications other than atherosclerosis, patients with prior ipsilateral CAS, ICA lesions with stenosis<50%, and transcarotid procedures were excluded. The cohort was divided into tandem and isolated lesion groups. The primary outcome was the composite of any perioperative neurologic events (stroke and transient ischemia attack) and death. Predictors of stroke/death were determined with multivariable logistic regression.

RESULTS: There were 2,016 carotid arteries stented in 1,950 patients; 1,881(96%) with isolated lesions, 135(4%) with tandem lesions. Mean age was 69.6±9.0. Tandem lesions were more likely to be present in women (50.4% vs. 33.0%; p<0.001). Other covariates were similar between the groups. Symptomatic lesions were present in 42.3% of cases (isolated: 42.2% vs tandem: 43.0%; p=0.86). More tandem group arteries had a prior CEA (45.9% vs. 35.4%; p=0.014). Arteries in the tandem group more often required multiple stents to treat the ICA lesion (9.6% vs. 5.2%; p=0.027). Neuroprotection had similar outcomes in both groups (Tandem: Success 94.1%, Failure 3.7%; Isolated: Success 96.3%, Failure 1.8%; p=0.29). The tandem group experienced a higher 30-day mortality (2.2% vs 0.6%;p=0.039), higher perioperative neurologic events (8.1% vs 2.0%; p<0.001), and higher incidence of the composite primary outcome (8.9% vs 2.4%;p<0.001). Predictors of the primary outcome in the multivariable model included treatment of tandem lesions (OR: 3.82;95%CI:1.96-7.43;p<0.001), symptomatic lesions (OR: 2.55;95%CI:1.48-4.40;p=0.001), use of multiple stents for the ICA lesions (OR: 2.29;95%CI:1.03-5.10;p=0.043), history of coronary artery disease (OR: 1.91;95%CI:1.11-3.29;p=0.020), and increasing age (OR: 1.03 per year;95%CI:1.00-1.07;p=0.041).

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CONCLUSION: The addition of endovascular treatment of tandem CCA lesions with CAS is associated with a four-fold increase in perioperative neurological events and death and should be avoided if possible.

DISCLOSURES: C. DeCarlo: None; A. Tanious: None; L.T. Boitano: None; J. Mohebali: None; D.H. Stone: None; W. Clouse: None; M.F. Conrad: None

2:50 pm 11 ♦

Long-Term Outcomes of Flared Limbs in Aneurysmal Iliac Arteries

R. Clement Darling, III, Alexander Kryszuk, Nicholas Russo, Jeffrey Hnath - Albany Medical College, Albany, NY

INTRODUCTION AND OBJECTIVES: Abdominal aortic aneurysms often occur concomitantly with aneurysmal iliac arteries requiring treatment via flared endograft limb, branch device, or hypogastric embolization with external iliac extension during endovascular repair. The long-term natural history of a flared limb in an aneurysmal iliac artery remains unclear. The purpose of this study is to determine the adequacy of flared limb usage in aneurysmal iliac arteries.

METHODS: A retrospective review of a prospectively collected database for one large vascular group was queried for large iliac limb use. A large limb was defined at a limb larger than 18 mm diameter. Demographics, operative details, and ancillary procedures were tabulated and compared using standard statistics etc.

RESULTS: 346 limbs with an iliac device limb greater than 18 mm in diameter (LRG) and 1646 limbs with devices less than 18 mm (REG) were implanted between 1/1/13 and 1/1/18 and followed for a median of 5.9 months (range 1-52). Demographics were similar between LRG and REG respectively: age (72.0 years, range 48-94 vs 72.7 years, range 33-100), male sex (89.8% vs 71.2%), coronary disease (19% vs 20%), hypertension (46% vs 46%), cholesterol (41% vs 37%) COPD (9.4 vs. 13.4), renal (2% vs 3%), diabetes (8.9% vs 10.3%), and tobacco (20% vs 18%). Operative mortality was similar between LRG and REG (1.63% vs 1.46%, P .849). The devices for the LRG group: 205 Gore, 9 Cook, 11 Medtronic, 18 Endologix and 3 Ovation. The devices for the REG group: 567 Gore, 203 Medtronic, 21 Endologix and 14 Cook. Post operatively 2 patients in the LRG group had acute limb occlusion versus 13 acute events in the REG group. Long term outcomes regarding revisions such as extensions and coiling were not significant (24, 9.8% LRG vs 107, 13% REG, P=.173).

CONCLUSIONS: Aneurysmal iliac arteries are frequently associated with abdominal aortic aneurysms and the natural history of an aneurysmal iliac artery treated with a large stent graft has been ill defined. This large series demonstrates the safety and long-term durability of flared limb use in large iliac arteries.

DISCLOSURES: R. Darling: None; A. Kryszuk: None; N. Russo: None; J. Hnath: None

3:05 pm **SCIENTIFIC SESSION III** (Live)
(8-minute presentation / 4-minute Q & A)
Moderator: Jennifer Stableford, MD & Carla Moreira, MD

3:05 pm Introduction from the Moderator

3:10 pm 12 ♦

Similar Five-Year Outcomes between Patients with and without Hostile Proximal Neck Anatomy Following Abdominal Aortic Aneurysm Repair with the Ovation Stent Graft Platform

Rens R.B. Varkevisser[1,2], Priya B. Patel[1], Nicholas J. Swerdlow[1], Chun Li[1], Hence J.M. Verhagen[2], Sean P. Lyden[3], Marc. L. Schermerhorn[1] – [1]Beth Israel Deaconess Medical Center, Boston, MA; [2]University Medical Center Rotterdam, The Netherlands; [3]Cleveland Clinic, Cleveland, OH

OBJECTIVE: The Ovation Abdominal Stent Graft Platform contains a polymer-filled proximal sealing ring that conforms to the patient's neck anatomy and is designed to improve proximal seal. We compared mid-term outcomes for patients with and without hostile neck anatomy undergoing infrarenal EVAR with the Ovation device.

METHODS: We used the ENCORE registry, identifying elective infrarenal EVAR patients from six clinical trials and the European Post-Market Registry (2009-2017). Hostile neck anatomy was defined by presence of at least one of the following features: neck length <10mm, reverse neck taper >10%, angulation >45°, and large diameter >34mm. We compared hostile vs. non-hostile neck anatomy as well as individual hostile characteristics vs. non-hostile anatomy. Primary outcome was five-year rate of type IA endoleak, secondary outcomes were type I/III endoleak, AAA-related re-interventions, and overall survival. The five-year rates were calculated using Kaplan-Meier estimates, and log-rank tests and Cox proportional hazards models were used to test univariate and risk-adjusted differences.

RESULTS: Of the 1,296 EVAR patients, 555 (44%) had hostile neck anatomy. The rate of type IA endoleak was similar at five-years between hostile vs. non-hostile neck anatomy (3.8% vs. 4.2%, P=0.47). Furthermore, no differences were seen in five-year rates of type I/III endoleaks (5.5% vs 6.1%; P=0.59) and AAA-related re-intervention (7.7% vs 7.3%; P=0.62). Five-year survival estimates were similar between hostile vs. non-hostile neck anatomy (76% vs. 81%; P=.20) (Figure 1-4). While large neck diameter demonstrated a trend towards higher rates of five-year type IA endoleaks (5.4%; P=.08), none of the individual neck characteristics demonstrated a statistically significant difference in type IA endoleak rates. Risk-adjusted analysis demonstrated no association between hostile neck anatomy and five-year type IA endoleak (HR: 1.17; 95%CI:0.58-2.36; P=.66).

CONCLUSION: Hostile neck anatomy is associated with similar five-year outcomes for patients treated with the Ovation stent graft platform compared to non-hostile anatomy. Therefore, we believe that the Ovation's sealing technique using polymer-filled sealing rings may mitigate the worse outcomes historically observed in patients with hostile neck anatomy.

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Figure 1. Type IA Endoleak

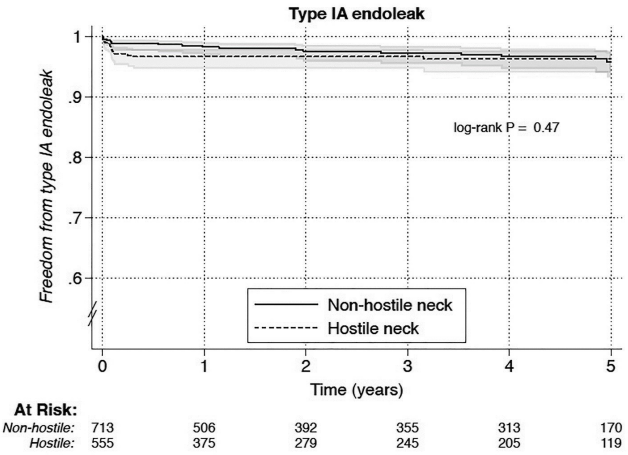


Figure 2. Type I or III Endoleak

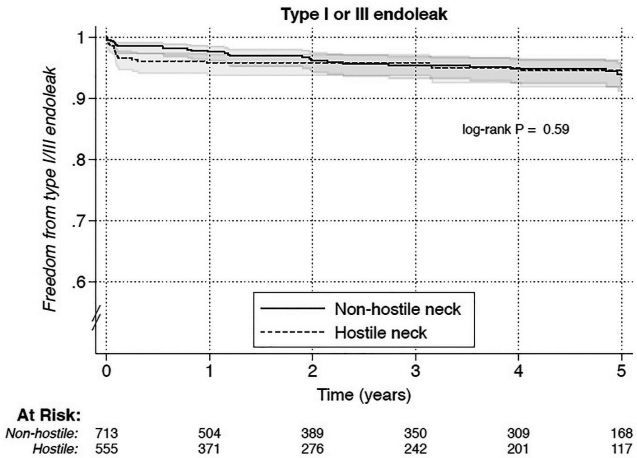


Figure 3. AAA Related Reintervention

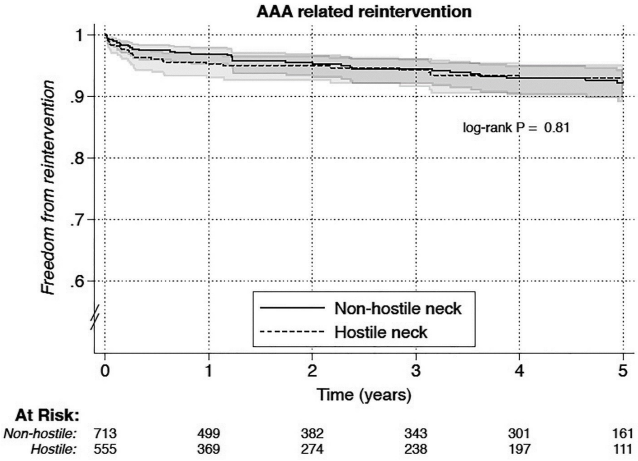
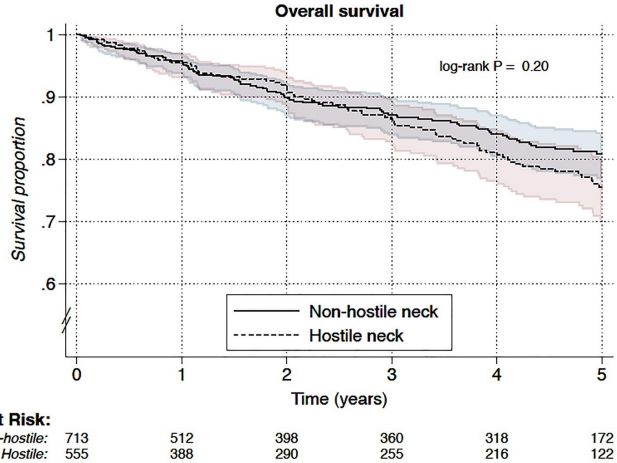


Figure 4. Overall Survival



DISCLOSURES: R. Varkevisser: None; P.B. Patel: Abbott, Cook, Medtronic, Endologix, Philips; N. Swerdlow: None; C. Li: None; H. Verhagen: None; S. Lyden: None; M. Schermerhorn: None

3:22 pm

13 (Video) ♦

Primary Venous Leiomyosarcoma Resection, IVC Reconstruction

Erion Qaja, Edward Gifford, Oscar Serrano - UConn/Hartford Hospital, Hartford, CT

The patient is a 77-year-old male referred to our clinic for persistent right leg swelling. Past medical history was significant for Grade 1 laryngeal cancer, previously treated with chemoradiation, and right lower extremity DVT in the common femoral vein on anticoagulation for three months. Hematologic workup was positive for persistent anti -cardiolipin antibody. Physical exam was consistent with non-pitting edema of the entire right lower extremity with palpable pedal pulses, as well as new-onset numbness in the sensory distribution of the genitofemoral nerve. Duplex at time of consultation showed a partially compressible common femoral vein with minimal proximal respiratory variation.

CT abdomen/pelvis a large retroperitoneal mass compressing and potentially involving the distal IVC was identified. This was better characterized as a complex soft tissue mass measuring 6.8 x7.3 cm on follow up MRI, with suspected origin from the IVC confluence. Patient was taken for curative R0 resection with venous reconstruction of the IVC and iliac vein confluence. Patient tolerated the procedure well, undergoing reconstruction of the IVC and bilateral iliac veins with 16 mm PTFE. Final pathology showed a primary IVC/ iliac vein leiomyosarcoma, Grade III, with no violation of the capsule and negative margins. The patient had prolonged ileus post-operatively but was successfully discharged on anticoagulation on post-operative day 11. At three-month follow-up his reconstruction is widely patent and leg swelling and neuropathy have resolved. Radical en bloc resection remains the gold-standard treatment for retroperitoneal tumors. This case demonstrates the multidisciplinary care of rare soft tissue tumors involving the central veins, notably in this case arising from the inferior vena cava (IVC) confluence.

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We present a case of oncologic resection of biopsy proven leiomyosarcoma arising from the inferior vena cava (IVC) confluence. We hope to elucidate the effectiveness of multidisciplinary approach as well as highlight the technical issues one encounters in resecting this rare yet challenging tumor involving vascular structures.

DISCLOSURES: E. Qaja: None; E. Gifford: None; O. Serrano: None

3:34 pm 14 ♦

Transcarotid Artery Revascularization Versus Carotid Endarterectomy and Transfemoral Stenting in Octogenarians

Ambar Mehta[1], Priya Patel[2], Danielle Bajakian[1], Richard Schutzer[1], Nicholas Morrissey[1], Karan Garg[3], Mahmoud Malas[4], Marc Schermerhorn[5], Virendra I. Patel[1] - [1]Columbia University Irving Medical Center, New York, NY; [2]Rutgers New Jersey Medical School, Newark, NJ; [3]New York University School of Medicine, New York, NY; [4]University of California San Diego Health, San Diego, CA; [5]Beth Israel Deaconess Medical Center, Boston, MA

INTRODUCTION AND OBJECTIVES: Transfemoral carotid stenting (TFCAS) has higher combined stroke and death rates in elderly patients compared to carotid endarterectomy (CEA). However, transcarotid artery revascularization (TCAR) may have similar outcomes to CEA. This study (1) characterized annual trends in TCARs and (2) compared their outcomes with CEAs and TFCAS, focusing on octogenarians.

METHODS: We included all patients with carotid artery stenosis, and no prior stenting or endarterectomy, who underwent either a TCAR, CEA, or TFCAS in the Vascular Quality Initiative from September 2016 (TCAR commercially available) to December 2019. We categorized patients into decades: 60s (60-69 years), 70s (70-79 years), and 80s (80-90 years). Outcomes included: in-hospital stroke, death within 30-days, a composite stroke/death outcome, and any postoperative neurological events (includes TIAs). Multivariable logistic regressions compared each outcome within every decade category after adjusting for patient demographics, clinical factors, symptomatology, urgency, hospital CEA volume, and clustering.

RESULTS: We identified 55,828 patients with carotid artery stenosis (35% in their 60s, 44% in their 70s, and 21% in their 80s), where half (51%) were symptomatic and the majority of procedures (86%) performed electively. The number of TCARs quadrupled from 833 in 2017 to 3206 in 2019. Overall rates of outcomes were: stroke (1.4%), death (0.8%), stroke/death (2.0%), and postoperative neurologic events (2.0%). Among octogenarians, the adjusted odds of all four outcomes were similar for TCAR relative to CEA: stroke (aOR 1.10 [95%-CI 0.75-1.63]), death (aOR 1.19 [0.72-1.97]), stroke/death (aOR 1.11 [0.80-1.53]), and postoperative neurologic events (aOR 1.09 [0.80-1.49]). In contrast, TFCAS had higher adjusted odds of all four outcomes compared to CEA. These results remained similar among patients in their 60s and 70s (Table).

CONCLUSIONS: In this nationwide study, TCARs had similar outcomes relative to CEAs among octogenarians. TCAR may serve as a promising less-invasive treatment for carotid disease in older patients who are deemed high anatomic, surgical, or clinical risk for CEA.

Table. Multivariable Logistic Regression Comparing All Four Outcomes within Each Decade Category Between CEAs, TFCAS and TCARs.

	Stroke	Death	Stroke/ Death	All Post-Op Neurologic Events
	Adjusted Odds Ratios (95%-CI)			
60-69 years				
CEA	Reference	Reference	Reference	Reference
TFCAS	1.27 (0.88 -1.84)	2.20 (1.40-3.46)	1.76 (1.31-2.36)	1.22 (0.87 -1.71)
TCAR	1.44 (0.95 -2.20)	0.62 (0.22-1.73)	1.30 (0.85-1.98)	1.38 (0.98 -1.95)
70-79 years				
CEA	Reference	Reference	Reference	Reference
TFCAS	1.44 (1.02 -2.03)	2.76 (1.92-3.97)	1.89 (1.43-2.48)	1.58 (1.17 -2.12)
TCAR	1.45 (1.02 -2.07)	0.91 (0.48-1.75)	1.26 (0.92-1.72)	1.29 (0.95 -1.76)
80-90 years				
CEA	Reference	Reference	Reference	Reference
TFCAS	2.14 (1.41 -3.27)	2.20 (1.45-3.34)	2.31 (1.66-3.21)	2.06 (1.43 -2.96)
TCAR	1.10 (0.75 -1.63)	1.19 (0.72-1.97)	1.11 (0.80-1.53)	1.09 (0.80 -1.49)

DISCLOSURES: A. Mehta: None; P. Patel: None; D. Bajakian: None; R. Schutzer: None; N. Morrissey: None; K. Garg: None; M. Malas: None; M. Schermerhorn: None; V.I. Patel: None

3:46 pm 15 ♦

The Effect of Thoracoabdominal Aortic Aneurysm Extent on Outcomes in Patients Undergoing Fenestrated/Branched Endovascular Aortic Repair

Kyle R. Diamond, Jessica P. Simons, Allison S. Crawford, Edward J. Arous, Dejah R. Judelson, Francesco A. Aiello, Douglas W. Jones, Louis Messina, Andres Schanzer - UMass Memorial Medical Center, Worcester, MA

INTRODUCTION: Outcomes after open repair of thoracoabdominal aneurysms (TAAA) have been definitively demonstrated to worsen as TAAA extent increases. However, the effect of TAAA extent on fenestrated/branched endovascular aneurysm repair (F/BEVAR) outcomes is unclear. We sought to investigate differences in outcomes of F/BEVAR based on TAAA extent.

METHODS: We reviewed a single-institution, prospectively-maintained database of all F/BEVAR procedures performed in an IRB-approved registry and/or physician-sponsored FDA investigational device exemption trial. Patients were stratified into two groups; (1) extensive (Extent 1-3 TAAA); or (2) non-extensive (juxtarenal, pararenal, and Extent 4 TAAA). Perioperative outcomes were compared with chi-square. Kaplan-Meier analysis of 3-year survival, target artery

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patency, reintervention, type 1 or 3 endoleak, and branch instability (type 1c or 3 endoleak, loss of branch patency, or target vessel stenosis >50%) were performed. Cox proportional hazards modeling was used to assess the independent effect of extensive TAAA on 1-year mortality.

RESULTS: Over the study period, 307 consecutive F/BEVAR procedures were performed for 90 (29%) extensive TAAA and 217 (71%) non-extensive TAAA. The majority of repairs utilized company-manufactured, custom-made devices (n=248, 81%). Between groups, no perioperative differences were observed in myocardial infarction, stroke, acute kidney injury, dialysis, target artery occlusion, access site complication, or type 1 or 3 endoleak (all p>.05). Perioperative paraparesis was higher in the extensive TAAA group (7.8% vs. 0.5%, p=.001), but paralysis was equivalent (2.2% vs 0.5%, p=.21). On Kaplan-Meier analysis, no differences in survival, target artery patency, or freedom from reintervention were observed at 3-years (all p>.05). Freedom from type 1 or 3 endoleak (p<.01) and branch instability (p<.01) were significantly lower in the extensive TAAA group. Cox proportional hazards modeling demonstrated that TAAA extent was not independently associated with survival (HR 1.79, 95% CI 0.91-3.53, p=.09).

CONCLUSIONS: Unlike open TAAA repair, F/BEVAR for extensive TAAAs is not associated with markedly inferior outcomes. Differences are likely accounted for by the increasing length of aortic coverage and number of target arteries involved. These findings suggest that high volume centers performing F/BEVAR for non-extensive TAAA should be able to maintain similar outcomes as an increasing number of extensive TAAA repairs are performed.

DISCLOSURES: K.R. Diamond: None; J.P. Simons: None; A.S. Crawford: None; E.J. Arous: None; D.R. Judelson: None; F.A. Aiello: None; D.W. Jones: None; L. Messina: None; A. Schanzer: Cook Medical

3:58 pm — 16 (Video)

3-Vessel Fenestrated Repair of 6cm Thoracoabdominal Aortic Aneurysm after a Chronic Type B Dissection

Mohammad Alqaim - UMASS Memorial Medical Center, Worcester, MA

INTRODUCTION AND OBJECTIVES: Experience with fenestrated endovascular aortic endograft (FEVAR) in the treatment of post dissection aneurysms remains challenging. A 49-year-old male with a history of type A dissection repair (ascending tube graft) presented with a residual 6-cm expanding extent III thoracoabdominal aortic aneurysm (TAAA). Our objective was to perform a 3-vessel FEVAR with a custom-made endograft with preloaded wires for each fenestration. Serial deployment technique was utilized. This technique allowed us to cannulate each target artery from above while keeping the rest of the fenestrated endograft below each fenestration still in the sheath. by keeping the endograft constrained, creates space outside of the endograft which is key to facilitate catheter/wire mobility and subsequent target artery cannulation.

METHODS: A custom-made fenestrated endovascular aortic endograft was designed on the basis of measurements obtained from high-resolution CTA images on a three-dimensional workstation using standard centerline flow orthogonal techniques (TeraRecon, Foster City, Calif). The graft design included fenestrations to the celiac artery, SMA, and right renal artery (RRA). The main body fenestrated graft was designed with a modified preloaded delivery system. We utilized IVUS to confirm true lumen presence and delivered main body fenestrated graft via groin using serial deployment technique. Balloon-expandable bridging stent grafts were deployed through the fenestrations to the celiac, SMA and RRA.

RESULTS: Completion angiography showed expansion of true lumen and patent visceral branches. The 1-month surveillance imaging demonstrated excellent stent graft architecture, no evidence of endoleak and favorable aortic remodeling.

CONCLUSIONS: FEVAR is a feasible option for patients with chronic type B aortic dissections with TAAAs. Serial deployment technique allows to keep the endograft constrained within the sheath below each fenestration creating space outside of the endograft which facilitates target artery cannulation in narrowed true lumen.

DISCLOSURES: M. Alqaim: None

4:10 pm — 17

Stress Testing Prior to Abdominal Aortic Aneurysm Repair Does Not Prevent Postoperative Cardiac Events

Jesse A. Columbo, Zachary J. Wanken, Daniel B. Walsh, Bjoern D. Suckow, Jocelyn M. Beach, Stanislav Henkin, Philip P. Goodney, David H. Stone - Dartmouth-Hitchcock Medical Center, Lebanon, NH

BACKGROUND: Stress testing is commonly utilized prior to abdominal aortic aneurysm (AAA) repair. Whether stress testing can prevent cardiac events after AAA repair remains unclear. Our objective was to study national stress test utilization rates and compare perioperative outcomes between high utilizing centers and low utilizing centers.

METHODS: We examined patients who underwent elective endovascular (EVR) or open (OPEN) AAA repair in the Vascular Quality Initiative. We measured utilization rates of stress testing across centers and compared the Vascular Study Group of New England Cardiac Risk Index (VSG-CRI) among patients who underwent preoperative stress tests to those who did not. We determined the rate of major adverse cardiac events (MACE), a composite of perioperative myocardial infarction, stroke, heart failure exacerbation, or death across centers. We compared MACE and one-year mortality among centers in the highest quintile of stress test utilization, versus those in the lowest quintile.

RESULTS: We studied 43,396 EVR patients and 8,935 OPEN patients. The median stress test utilization prior to EVR was 35.9%, and varied from 10.2% (5^{th} percentile) to 73.7% (95^{th} percentile), with similar variability for OPEN (median:57.9%, range:13.0%-86.0%). The mean VSG-CRI for patients who did not undergo stress testing was 5.4(±2.1) for EVR, and 4.8(±2.1) for OPEN. Patients who underwent stress testing had a slightly higher VSG-CRI score (EVR:5.6(±2.1), OPEN:5.1(±2.0), Figure). The rate of MACE was 1.8% after EVR and 11.6% after OPEN. One-year mortality was 4.6% for EVR and 6.6% for OPEN. Centers in the highest quintile of stress testing had a higher adjusted likelihood of MACE(EVR:OR:1.78; 95%CI:1.37-2.30; OPEN:OR:1.92; 95%CI:1.49-2.47), but similar one-year mortality (EVR:OR:1.18; 95%CI:1.02-1.37; OPEN:OR:0.86; 95%CI:0.64-1.15) compared to centers in the lowest quintile. The VSG-CRI was not different among high utilization (EVR:5.5±2.1; OPEN:5.0±2.0), and low utilization centers (EVR:5.5±2.1; OPEN:4.9±2.0).

CONCLUSIONS: Stress test utilization prior to AAA repair varies widely despite similar patient risk profiles. There was no observed reduction in MACE or one-year mortality among high stress test utilizing centers. The value of routine stress testing prior to AAA repair should be reconsidered and used on a more judicious basis.

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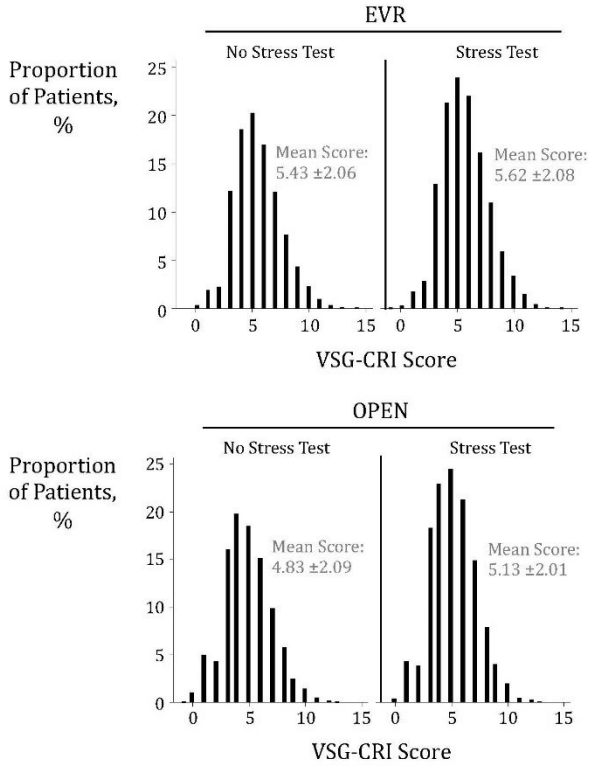
Figure. VSG CRI for Patients Who Underwent Preoperative Stress Testing versus those Who Did Not



DISCLOSURES: J.A. Columbo: None; Z.J. Wanken: None; D.B. Walsh: None; B.D. Suckow: None; J.M. Beach: None; S. Henkin: None; P.P. Goodney: None; D.H. Stone: None

4:22 pm — 18

A Multicenter, Prospective Randomized Trial of Negative Pressure Wound Therapy for Infrainguinal Revascularization Groin Incisions

Daniel Bertges[1], Lisa Smith[1], Rebecca Scully[2], Mark Wyers[3], Jens Eldrup-Jorgenson[4], Bjoern Suckow[5], C. Keith Ozaki[2], Louis Nguyen[2] - [1]University of Vermont Medical Center, Burlington, VT; [2]Brigham and Women's Hospital, Boston, MA; [3]Beth Israel Deaconess Medical Center, Boston, MA; [4]Maine Medical Center, Portland, ME; [5]Dartmouth Hitchcock Medical Center, Lebanon, NH

OBJECTIVE: To assess the impact of closed incision negative pressure therapy (ciNPT) on groin incision complications following infrainguinal bypass and femoral endarterectomy.

METHODS: Patients (n=242) undergoing infrainguinal bypass (n=114) or femoral endarterectomy (n=118) at five academic medical centers in New England from April 2015 to August 2019 were randomized to ciNPT (PREVENA™, KCI) (n= 118) or standard gauze (n= 124). The primary outcome measure was a composite of 30-day groin wound complications (surgical site infection (SSI), major non-infectious complications or graft infection). Secondary outcome measures included (1) 30-day SSI (2) 30-day non-infectious wound complications, (3) readmission for wound complications, (4) significant adverse events, and (5) health related (HR) by Euro Quality of Life (QoL) 5D-3L survey.

RESULTS: The ciNPT and control groups had similar demographics, comorbidities and operative characteristics. There was no difference in the 30-day primary composite outcome: ciNPT vs. control (31% vs 28%, P= 0.55). SSI at 30-days was similar; ciNPT vs. control (11% vs 12%, P= 0.58). Infectious (13.9% vs. 12.6%, P= 0.77) and non-infectious wound complications (20.9% vs. 17.6%, P= 0.53) were similar for ciNPT and control groups respectively. Wound complications requiring readmission were ciNPT vs. control groups (9% vs. 7%, P= 0.54). Significant adverse event rates were not different for ciNPT vs. control groups (13% vs. 16%, P= 0.53). The mean length of hospitalization was the same for ciNPT and control (5.2 vs. 5.7 days, P= 0.63). Overall HR QoL was similar at baseline and at 14 and 30-day postoperatively for the two groups. We found no difference among subgroups: gender, obesity diabetes, smoking, claudication vs. chronic limb threatening ischemia and bypass vs. endarterectomy. Multivariableanalysis showed no difference in wound complications at 30 days for ciNPT vs gauze (Odds ratio 1.4, 95% CI 0.8-2.6, P= 0.234).

CONCLUSION: This multicenter trial of infrainguinal revascularization found no difference in 30-day groin incision complications in patients treated with ciNPT vs. control. The SSI rate was lower in the control group than in other published studies, suggesting other practice patterns reduced baseline groin infections. Further study may identify subsets of higher risk patients that might benefit from ciNPT.

DISCLOSURES: D. Bertges: Acelity, KCI. L. Smith: None; R. Scully: None; M. Wyers: None; J. Eldrup-Jorgenson: None; B. Suckow: None; C. Ozaki: None; L. Nguyen: None

4:45 pm — **INTRODUCTION OF THE PRESIDENT** (Live)
Palma Shaw, MD
SUNY Upstate Medical Center, Syracuse, NY

5:00 pm — **PRESIDENTIAL ADDRESS** (Live)
Rise to the Challenge
Marc Schermerhorn, MD
Beth Israel Deaconess Medical Center, Boston, MA

SATURDAY, SEPTEMBER 12, 2020

7:30 am — **ANNUAL MEMBER BUSINESS MEETING**
(Members Only)

- Society Updates
- Vote—Bylaw Amendments
- Vote—New Members
- Proposed Slate (2020-2021)
- Introduction of Incoming President

8:00 am — **INDUSTRY SPONSORED SYMPOSIUM #3** (Live)
Shockwave IVL for Calcified BTK, CFA and Iliac Disease
Paul Bloch, MD, Matthew Alef, MD & Nathan Aranson, MD

Presented by: Shockwave Medical

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8:30 am **INDUSTRY SPONSORED SYMPOSIUM #4** (Live)
GORE® EXCLUDER® Conformable AAA Endoprosthesis: Clinical Trial Update and Early Experience
Robert Rhee, MD

Presented by: W. L. Gore

9:00 am **SCIENTIFIC SESSION IV – RAPID FIRE PAPERS** (Live)
(3-minute presentation / 2-minute Q & A)
Moderators: Palma Shaw, MD & Alan Dardik, MD, PhD

9:00 am Introduction from the Moderator

9:05 am 19 (RF)
Off Label Use of EVAR Devices is Associated with Adverse Outcomes and Should Be Avoided
Thomas FX O'Donnell, Laura T. Boitano, Jahan Mohebali, Glenn M. LaMuraglia, Christopher J. Kwolek, Mark F. Conrad - Massachusetts General Hospital, Boston, MA

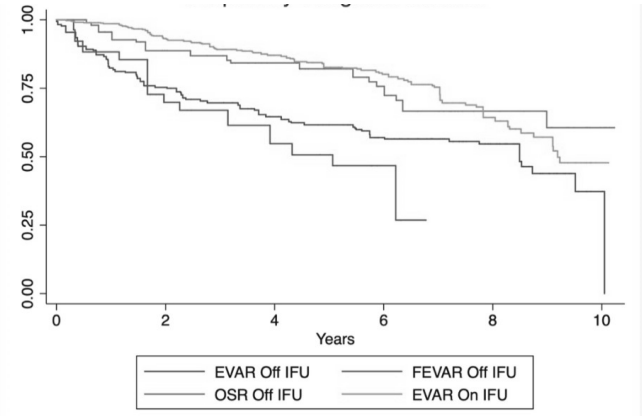
INTRODUCTION AND OBJECTIVES: Endovascular aneurysm repair (EVAR) is associated with worse outcomes in patients not meeting device instructions for use (IFU). However, whether open repair (OSR) and fenestrated EVAR (FEVAR) represent better options for these patients is unknown.

METHODS: We identified all patients without prior aortic surgery undergoing elective repair of juxtarenal and infrarenal aortic aneurysms at a single institution with EVAR, OSR and FEVAR. We applied device-specific aneurysm neck-related IFU to EVAR patients, and generic IFU to FEVAR and open patients. We calculated propensity scores and used inverse probability weighting, clustering by surgeon, to compare outcomes among EVAR patients by adherence to IFU, and by treatment modality in patients not meeting IFU.

RESULTS: Of 657 patients (477 EVAR, 35 FEVAR, 145 OSR), there were 271 (42%) treated whose measurements were outside of standard EVAR IFU. Perioperative mortality was 0.5% overall. For EVAR, treatment outside the IFU was associated with significantly lower adjusted rates of freedom from Type IA endoleak (83% at 5 years compared to 98%, HR 5.8[2.4-14.4], P<.0001), and survival (82% and 45% at 5 and 10 years for IFU patients compared to 61% and 39% for non-IFU patients, HR 2.1 [1.3-3.4], P=.003). There was no difference in reinterventions or open conversion. In patients not meeting IFU, adjusted survival was significantly higher for OSR (adjusted 5 year survival: 62% EVAR, 51% FEVAR, 82% OSR; EVAR as referent: OSR: HR 0.5[0.3-0.96], P=0.04, FEVAR: HR 1.4[0.6-3.3], P=.4) (Figure). When only patients deemed fit for OSR were considered, survival was similar for EVAR and OSR, but mortality and reinterventions were significantly higher for FEVAR (mortality: HR 3.0 [1.3-7.0], P=.01; reinterventions: HR 3.4[1.7-7.1], P=.001).

CONCLUSIONS: Treatment outside device-specific IFU is associated with adverse long-term outcomes. Open surgical repair is associated with higher long-term survival in patients who fall outside of the EVAR IFU, and should be favored over EVAR in this cohort.

Figure. Propensity-Weighted Survival



Long-term survival in patients not meeting graft Instructions for Use (IFU), using inverse probability weighting. Survival in EVAR patients meeting IFU provided as reference. Standard errors <0.1, P<.05 for comparisons between OSR and EVAR/FEVAR in patients off IFU, and P<.01 for EVAR patients off IFU compared to EVAR patients on IFU.

DISCLOSURES: T.F. O'Donnell: None; L.T. Boitano: None; J. Mohebali: None; G.M. LaMuraglia: None; C.J. Kwolek: None; M.F. Conrad: None

9:10 am 20 (RF)
Long-Term Tunneled Dialysis Catheters Use is Not Associated with Mortality but is Associated with Increased Morbidity
Victor K. Castro, Alik Farber, Yixin Zhang, Quinten Dicken, Logan Mendez, Scott R. Levin, Thomas W. Cheng, Rebecca B. Hasley, Jeffrey J. Siracuse - Boston University School of Medicine, Boston, MA

OBJECTIVES: Tunneled dialysis catheters (TDC) are used as temporary means to provide hemodialysis until permanent arteriovenous (AV) access is established. However, some patients may end up having TDC for long-term. Our objective was to evaluate patient characteristics, reasons for, and mortality associated with long-term TDC use.

METHODS: A retrospective single institution analysis was performed. Long-term TDC use was defined as >180 days without more than a 7-day temporary removal time. Reasons for long-term TDC use and complications were recorded. Summary statistics were performed. Multivariable analysis was completed that compared mortality between patients with long-term TDC use to a comparison cohort who underwent AV access creation with subsequent TDC removal.

RESULTS: We identified 50 patients with long-term TDC use from 2013-2018. The average age was 63 years, 44% were male, and 76% were African American. Previous TDC use was found in 42%. Median TDC duration was 333 days (range 185-2029). The primary reasons for long-term TDC use were failed AV access (34%), non-maturing AV access (32%), delayed AV access placement (14%), no AV access options (10%), patient refusal for AV access placement (6%), and medically high-risk for AV access placement (4%). In 46% of patients, TDC complications occurred including central venous stenosis (33.4%), TDC-related infections (29.6%), TDC displacement (27.8%), and thrombosis (7.9%). Overall, 47.6% required a catheter exchange. The majority (76.4%) had their catheter removed during

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follow-up. The long-term TDC group, in relation to the comparator group (n=201), had fewer males (44% vs. 61.2%, P=.028) and higher proportion of congestive heart failure (66% vs. 40.3%, P=.001). Kaplan-Meier analysis showed no significant difference in survival at 24 months for the long-term TDC to the comparator group (93.6% vs. 92.7%, P=.28). In multivariable analysis, long-term TDC use was not associated with mortality (HR 0.72, 95% CI .29-1.8, P=.48).

CONCLUSIONS: As expected, patients with long-term TDCs experienced significant TDC-related morbidity, however long-term TDC use was not associated with increased mortality. While permanent access is preferable, some patients may require long-term TDC use due to difficulty establishing a permanent access, limited access options, and patient preference.

DISCLOSURES: V.K. Castro: None; A. Farber: None; Y. Zhang: None; Q. Dicken: None; L. Mendez: None; S.R. Levin: None; T.W. Cheng: None; R.B. Hasley: None; J.J. Siracuse: None

9:15 am

21 (RF)

Comparative Analysis of Open Abdominal Aortic Aneurysm Repair Outcomes Across National Registries

Rebecca E. Scully, Gaurav Sharma, Andrew J. Soo Hoo, Jillian Walsh, Ginger Jin, Matthew T. Menard, Charles Keith Ozaki, Michael Belkin - Brigham and Women's Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Lower mortality after open abdominal aortic aneurysm repair (OAAAR) has been demonstrated in the Society for Vascular Surgery (SVS) Vascular Quality Initiative (VQI) database when compared to previously published reports of other national registries. Understanding these differences is essential as these datasets increasingly inform clinical guidelines and health policy.

METHODS: The VQI, American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP), and National Inpatient Sample (NIS) databases were queried for elective OAAAR between 2013 and 2016. Chi-square tests were used for frequencies, ANOVA for continuous variables. A multivariate analysis using logistic models for in-hospital and 30-day mortality adjusting for age, gender, race, comorbidities, and smoking status was also performed.

RESULTS: In total, data from 8775 patients were analyzed. Significant differences were seen across baseline characteristics (Table 1). Additionally, the availability of patient and procedural data varied widely across datasets (Table 1). LOS and discharge destination differed significantly, as did in-hospital mortality: NIS 5.5%, NSQIP 4.5%, VQI 3.3%; P<0.001 (Table 2). 30-day mortality was found to be 3.5% in VQI and 5% in NSQIP (P<0.001). These differences were again demonstrated in adjusted analyses for both in-hospital (NIS vs VQI: OR 1.52, 95%CI 1.18-1.95, P=0.001; NSQIP vs VQI: OR 1.79, 95%CI 1.33-2.40, P<0.001) and 30-day mortality (NSQIP vs VQI OR 1.62, 95%CI 1.19-2.20, P=0.002).

CONCLUSIONS: There are fundamental important differences in patient demographics, comorbidity profiles, and outcomes after OAAAR across widely used national registries. This may represent differences in outcomes between institutions that elect to participate in the VQI or NSQIP versus the broader results obtained from the NIS. In addition to avoiding direct comparison of information derived from these databases, it is critical that these differences are taken into account when making policy decisions and guidelines based on these data repositories.

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Table 1. Baseline Characteristics of Patients Undergoing OAAAR by National Database

Variable		NSQIP (N=1667)	NIS (N=3196)	VQI (N=3912)	P-value
Mean age, years (SD)		70 (8.8)	69 (9.2)	69 (8.3)	<0.001
Female sex (%)		432 (26)	916 (29)	1007 (26)	0.032
Race	White (%)	1178 (71)	2576 (81)	3509 (90)	<0.001
	Black (%)	65 (3.9)	162 (5.1)	181 (4.6)	
	Other/Missing (%)	424 (25)	458 (14)	222 (5.7)	
Obese (BMI > 30, %)		476 (29)		1108 (28)	<0.001
Primary insurer	Medicare (%)		2135 (67)	2097 (54)	<0.001
	Medicaid (%)		133 (4.2)	130 (3.3)	
	Commercial (%)		773 (24)	1398 (36)	
	Military/VA (%)			53 (1.3)	
	Other (%)		146 (4.6)	209 (5.3)	
Comorbidities	HTN (%)	1324 (79)	2054 (64)	3324 (85)	<0.001
	DM (%)	205 (12)	518 (16)	679 (17)	<0.001
	CAD (%)		234 (7.3)	1012 (26)	<0.001
	CHF (%)	25 (1.5)	289 (9.0)	316 (8.1)	<0.001
	COPD (%)	337 (20)	1130 (35)	1276 (33)	<0.001
	CKD (%)	98 (5.9)	270 (8.5)	198 (5.1)	<0.001
	Current/prior smoker (%)	750 (45)	1065 (33)	3563 (91)	<0.001
AAA diameter, cm (SD)				5.9 (1.8)	
Approach	Transperitoneal (%)			2848 (73)	
	Retroperitoneal (%)			1042 (27)	
Mean EBL, mL (SD)				1845 (1807)	
Concomitant procedure (%)		501 (30)			
Total procedure time, min (SD)		251 (117)		256 (106)	<0.001

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Table 2. Unadjusted Outcomes in Patients Undergoing OAAAR by National Database

Outcome		NSQIP (N=1667)	NIS (N=3196)	VQI (N=3912)	P-Value
Mortality					
	In-hospital mortality (%)	75 (4.5)	177 (5.5)	129 (3.3)	<0.001
	30-Day mortality (%)	83 (5.0)		137 (3.5)	<0.001
	90-Day mortality (%)			187 (4.8)	
Length of stay					
	Mean hospital LOS, days (SD)	10.3 (9.5)	9.5 (8.7)	9.4 (10.6)	0.003
Disposition					
	Home (%)	1213 (73)	2296 (73)	2987 (76)	<0.001
	Short-/Longterm Facility (%)	362 (22)	717 (22)	794 (20)	
	Died (%)	87 (5.2)	177 (5.5)	129 (3.3)	

Disclosures: R.E. Scully: None; G. Sharma: None; A.J. Soo Hoo: None; J. Walsh: None; G. Jin: None; M.T. Menard: None; C.K. Ozaki: None; M. Belkin: None

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9:20 am

22 (RF)

Occupational and Patient Radiation Dose Reduction with a Reduced Frame Rate and Roentgen Protocol Utilizing Fixed Imaging

Alex M. Lin, Amanda C. Methe, Vincent R. Narvaez, Matthew Kronick, Volodymyr Labinskyy, Marc A. Norris, Amanda Kravetz, Avery Y. Ching, Neal C. Hadro, Marvin E. Morris - Baystate Medical Center, Springfield, MA

INTRODUCTION: Currently, ALARA (as low as reasonably achievable) is the guiding principle in radiation (XR) safety, but there is a lack of standardization of XR protocols. Given the longitudinal effects of continued XR exposure on providers' life-time risk of XR induced carcinoma and cataract formation, there is a need to establish an imaging standard that minimizes occupational risks without sacrificing image quality. We utilized an imaging protocol using a reduced frame rate (Fr) and Roentgen (R) to assess patient and occupational XR exposure in a hybrid fixed imaging suite for Endovascular Aneurysm Repair (EVAR) and Thoracic Endovascular Aneurysm Repair (TEVAR).

METHODS: Retrospective analysis of occupational XR dose of Operating Room (OR) personnel and patients before and after implementing a modified preset imaging protocol from 15Fr/5R to 7.5Fr/2.5R during 2018 to 2020. All OR staff wore XR dosimetry badges to record monthly dose equivalent levels: Lens (LDE), Shallow (SDE), and Deep (DDE). Patient XR dose was calculated by Air Kerma (AK) and Dose Area Product (DAP). Wilcoxon rank sum test demonstrated significance ($p<0.05$).

RESULTS: All OR personnel had significantly lower SDE(180mRem vs 55mRem, p=0.007), lower LDE(191mRem vs 59mRem, p=0.011) and a trend toward significance for a lower DDE(58.5mRem vs 21mRem, p=0.068) with the new imaging protocol (Figure 1). In TEVAR and EVAR procedures, there were significant reductions in patient radiation dose with lower AK and DAP($p<0.05$) without increasing OR fluoroscopic time (Figure 2).

CONCLUSION: With the expansion of complex endovascular procedures, measures should be taken to minimize the harmful effects of lifelong XR. This study demonstrates a significant reduction in XR dose in both patients and OR staff for both TEVAR and EVAR procedures with the use of a 7.5Fr/2.5R imaging protocol in fixed imaging. We aim to establish a guideline to mitigate the longitudinal effects of XR for staff and patients.

Figure 1. Median Dosimetry for All OR Staff Pre- and Post-Utilization of a Reducing Radiation Protocol

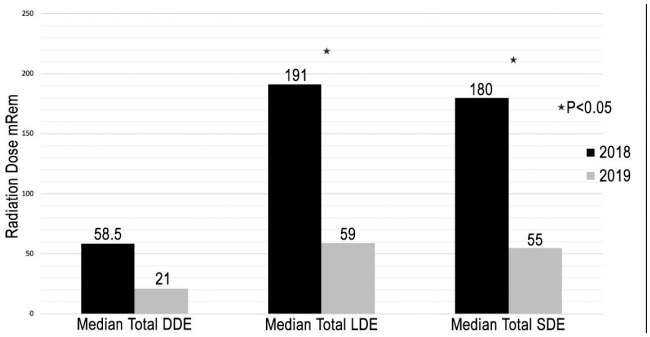
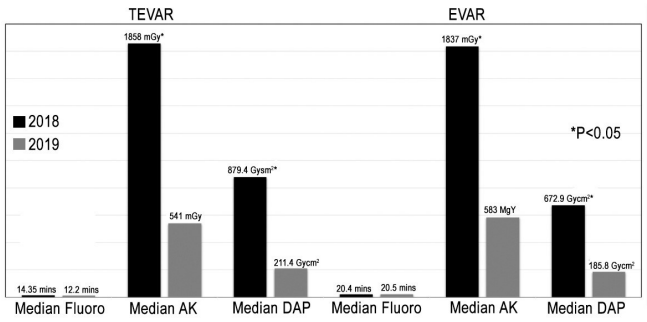


Figure 2. Patient Radiation Exposure Dose for TEVAR and EVAR Procedures Pre- and Post-Reduced Radiation Protocol



DISCLOSURES: A.M. Lin: None; A.C. Methe: None; V.R. Narvaez: None; M. Kronick: None; V. Labinskyy: None; M.A. Norris: None; A. Kravetz: None; A.Y. Ching: None; N.C. Hadro: None; M.E. Morris: None

9:25 am

23 (RF)

Short and Long-Term Outcomes after Concurrent Splenectomy for Thoracoabdominal Aortic Aneurysm Repair

Christopher A. Latz, Laura T. Boitano, Charles DeCarlo, Zach Feldman, Maximilian Png, Jahan Mohebali, Anahita Dua, Mark F. Conrad - Massachusetts General Hospital, Boston, MA

INTRODUCTION AND OBJECTIVES: Splenectomies are often performed during open Thoracoabdominal Aortic Aneurysm (TAAA) Repair, as capsular tears are common and can be associated with significant bleeding. The effect of incidental splenectomy on outcomes after TAAA repair is unknown.

METHODS: All open type I-III TAAA repairs performed from 1987-2015 were evaluated using a single institutional database. Primary endpoints were in-hospital death, major adverse events (MAE) and long-term survival. Secondary endpoint was hospital length of stay (LOS). All repairs performed for rupture were excluded. Logistic and linear multivariable regression were used for the in-hospital endpoints and survival analyses were performed with Cox Proportional Hazards modelling and Kaplan-Meier techniques.

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RESULTS: Six hundred forty-nine patients met study inclusion criteria. One hundred fifty (23%) of these patients had a concurrent splenectomy (CS) and six patients required an emergency splenectomy secondary to bleeding post-operatively, leaving 156 total splenectomies while in house. Full demographic and procedural differences between the groups can be found in table 1. Mortality rate was 5.8% in the CS group (p=1.0) compared to 5.6% in the non-CS group (p=1.0). MAE were experienced by 48% of splenectomy patients compared to 34% of those without splenectomy (p=0.003). Multivariable analysis revealed splenectomy to not independently predict of perioperative death (AOR: 0.93, 95% CI 0.40, p=0.87). However, splenectomy was found to be independently predictive of any major adverse event (MAE) (AOR: 1.78 95% CI 1.19, 2.64, p=0.005). Splenectomy was also associated with a longer LOS (+5.55 days, 95% CI 2.01, 9.10, p=0.002). There was a no survival difference between the cohorts in the total splenectomy cohort in the unadjusted (log-rank p=1.0) nor the adjusted analysis (splenectomy AHR: 0.99, CI: 0.75, 1.30, p=0.9).

CONCLUSIONS: Incidental splenectomy during open repair TAAA did not lead to increase perioperative mortality but did lead to significantly increased perioperative morbidity and longer hospital LOS. There was no difference in long-term survival outcomes when concurrent splenectomy was performed. Splenectomy during TAAA repair should be avoided when feasible.

Table 1. Demographics

Variable	Splenectomy Median [IQR] or n (%)	No Splenectomy Median [IQR] or n (%)	P-value
Number	150 (23.1)	499 (76.9)	
Age	70 [66, 76]	72 [66,77]	0.49
Female	83 (55.3)	225 (45.1)	0.03
Crawford Extent:			
1	38 (25.3)	109 (21.8)	0.03
2	18 (12.0)	68 (13.6)	
3	60 (40.0)	152 (30.5)	
4	34 (22.7)	170 (34.1)	
DM	44 (8.8)	15 (10.0)	0.63
Smoking history	132 (88.0)	409 (82.0)	0.10
Symptomatic	16 (10.8)	50 (10.4)	0.88
Diameter (cm)	6.4 [6, 7]	6.1 [5.6, 7.1]	0.13
Hypertension	131 (87.3)	436 (87.4)	1.0
Coronary artery disease	54 (36.0)	215 (43.1)	0.13
COPD	44 (29.3)	108 (21.6)	0.06
History aortic aneurysm repair	49 (32.7)	145 (29.1)	0.42
Marfan's syndrome	4 (2.7)	15 (3.0)	1.0
Inflamed/Infected	2 (1.6)	8 (1.6)	1.0
Admission Creatinine	1.1 [0.9, 1.4]	1.2 [0.9, 1.5]	0.11
Intraoperative Details:			
Left Heart Bypass/MEVP	66 (44.0)	110 (22.0)	<0.001
Visceral bypass	50 (34.3)	74 (15.1)	<0.001
Renal bypass	93 (62.4)	334 (67.6)	0.28
Visceral cross-clamp time (min)	40 [30, 55]	43 [31, 53]	.34
Total cross-clamp time (min)	78 [62, 100]	78 [60, 97]	0.50
Total operative time (min)	313 [256, 397]	360 [305, 484]	<0.001

DISCLOSURES: C.A. Latz: None; L.T. Boitano: None; C. DeCarlo: None; Z. Feldman: None; M. Png: None; J. Mohebali: None; A. Dua: None; M.F. Conrad: None

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9:30 am

24 (RF)

Trends in General Surgery Operative Experience for the Integrated Vascular Surgery Resident

Emily Fan, Allison Crawford, Edward J. Arous, Dejah R. Judelson, Francesco Aiello, Andres Schanzer, Jessica Simons - University of Massachusetts, Worcester, MA

OBJECTIVE: When the integrated vascular surgery training pathway was introduced, training was comprised of nearly equal amounts of core general surgery and vascular surgery experience. However, specific requirements for case numbers or types were not defined. Over time, the core general surgery requirements have been reduced, most recently in 2018, from 24 to 18 months. We sought to determine trends in general surgery case volume and type over the past 10 years for vascular surgery residents.

METHODS: We conducted a retrospective review of the Accreditation Council for Graduate Medical Education case log data for integrated vascular surgery graduates from 2012-2018. We evaluated trends in mean numbers of cases, categorized as general surgery open (GS-open), general surgery laparoscopic (GS-laparoscopic), vascular surgery open (VS-open), and vascular surgery endovascular (VS-endo). Cases were also categorized by anatomic region as head/neck, thoracic, or abdominal.

RESULTS: The mean number of cases logged by graduating integrated vascular surgery trainees was 263.5. This total, as well as the proportion of general surgery cases has remained constant over time (35-38%, p=0.99). The type of general surgery cases has changed significantly, with an upward trend in the mean number of GS-open cases and downward trend in mean GS-laparoscopic cases (GS-open p=0.006, GS-laparoscopic p=0.048). Among head/neck and thoracic subgroups, no significant changes were observed, while in the abdominal subgroup, there has been a significant increase in GS-open over time (p=0.005).

CONCLUSIONS: In the 10 years since the introduction of integrated vascular surgery programs, total case volume and proportion of general surgery cases have remained remarkably stable. The type of general surgery cases has shifted though, with a decrease in GS-laparoscopic cases, replaced primarily by open abdominal cases. These changes likely reflect integrated vascular residents actively seeking out these opportunities during their core rotations and a willingness by general surgery partners to provide these opportunities. At the program level, these data may help guide program directors' choices about the specific core rotations they incorporate into their curriculum. At the national level, this information may contribute to future discussions regarding the optimal number of core general surgery rotation requirements.

DISCLOSURES: E. Fan: None; A. Crawford: None; E.J. Arous: None; D.R. Judelson: None; F. Aiello: None; A. Schanzer: None; J. Simons: None

9:35 am

25 (RF)

Characteristics and Outcomes of Ruptured Abdominal Aortic Aneurysms Below the Size Threshold for Elective Repair

Kirthi Bellamkonda, Naiem Nassiri, Mehran M. Sadeghi, Yawei Zhang, Raul Guzman, Cassius I. Ochoa Chaar - Yale School of Medicine, New Haven, CT

INTRODUCTION: The current guidelines recommend elective AAA repair at 5.5cm in men and 5.0cm in women. However, rupture occurs in patients with aneurysm size below these thresholds. This study aims to investigate the proportion of small ruptured AAA (rAAA) below elective operative thresholds and compare outcomes of repair to larger aneurysms.

METHODS: The 2011-2018 ACS-NSQIP open and endovascular AAA repair databases were reviewed for all cases of rAAA. Patients were divided into two groups: "small rAAA" for those that present below size thresholds and "large rAAA" for the remainder. The proximal/distal extent of rAAA as well as the pre-operative characteristics and outcomes of infrarenal rAAA were compared.

RESULTS: Of the 1,612 ruptured AAA repairs, 167 (10.4%) were small rAAAs. The proportion of small rAAA did not significantly change during the study period (p=0.15) (Fig). Patients in the large rAAA group were more likely to have juxta/suprarenal aneurysms (27% vs 16%, P=.001). Patients in the small infrarenal rAAA group had significantly lower BMI, were more likely to be African American and have hypertension. Patients in the small AAA group were more likely to have ASA classification ≤ 3, and to undergo EVAR but less likely to have hypotension on presentation. Repair of small rAAA was associated with lower bleeding, mortality, mean operative time, and higher readmission. (Table) Multivariate analysis showed that rupture with hypotension, open repair, general anesthesia, age, and high ASA were associated with increased mortality, but aneurysm size was not.

CONCLUSION: Current guidelines for elective repair based solely on AAA sac diameter fail to identify 10% of patients presenting with rupture. Ruptured AAA carries significant mortality regardless of the size of the aneurysm. Further research into sac morphology and more sensitive imaging modalities may help identify small rAAA at high risk of rupture that would benefit from elective repair.

Figure. Small AAA Ruptures as a Proportion of all AAA Ruptures Over Time, Showing No Significant Change in Rate (p=0.15)

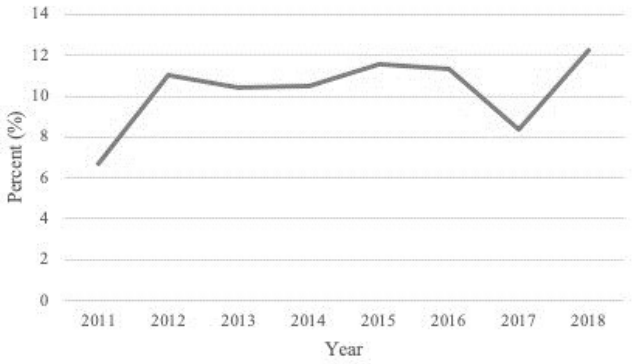

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Table. Demographics, Comorbidities, Operative Characteristics and Outcomes of rAAA

	Small Infrarenal rAAA	Large Infrarenal rAAA	
	n (%)	n (%)	p value
Total	141 (100)	1051 (100)	
Age			
<50	3 (2.1)	40 (3.8)	
51-64	29 (20.5)	200 (19.0)	
65-79	42 (29.7)	311 (29.5)	
80+	56 (39.7)	371 (35.3)	0.86
Mean (std. Dev.)	71.8 (11.6)	70.8 (11.8)	0.38
Male Sex	105 (74.4)	817 (77.7)	0.38
Functional Status			0.16
Dependent	8 (5.6)	35 (3.3)	
BMI			P<0.010.02*
<18	14 (9.9)	95 (9.0)	
18-24	47 (33.3)	217 (20.6)	
25-30	39 (27.6)	282 (26.8)	
30-34	12 (8.5)	188 (17.8)	
35+	16 (11.3)	134 (12.7)	
Mean BMI (SEM)	26.1 (0.6)	27.8 (0.2)	
Mean Height (SEM)	67.6 (0.3)	67.7 (0.1)	0.65
Mean Weight, kg (SEM)	80.3 (1.8)	86.8 (0.7)	p<0.01*
Race			
White	102 (72.3)	790 (75.1)	
African American	17 (12.1)	53(5.0)	p<0.01*
Other	22 (15.6)	208 (19.7)	
Comorbidities			
Diabetes Mellitus	22 (15.6)	144 (13.7)	0.54
Current Smoker	52 (36.8)	401 (38.1)	0.76
COPD	26 (18.4)	162 (15.4)	0.35
CHF	3 (2.1)	32 (3.0)	0.54
HTN	106 (75.1)	692 (65.8)	0.02*
Current dialysis	3 (2.1)	16 (1.5)	0.59

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Presentation			
AAA diameter (mean ± SEM)	4.4 (0.1)	8.0 (0.1)	p<0.01*
Rupture with hypotension	47 (33.3)	521 (49.5)	p<0.01*
Surgical Technique			
EVAR	111 (78.7)	685 (65.1)	p<0.01*
Open	30 (21.2)	366 (34.8)	
Anesthesia Technique			
GA	126 (89.3)	959 (91.2)	
Other	15 (10.6)	92 (8.7)	0.46
ASA ≥ 4	99 (70.2)	862 (82.0)	p<0.01*
Mean operating time (min ± SEM)	163.7 (8.9)	182.3 (8.9)	0.03*
Complications			
Wound infection	5 (3.5)	36 (3.4)	0.94
Pneumonia	10 (7.0)	100 (9.5)	0.35
Unplanned intubation	11 (7.8)	93 (8.8)	0.67
Failed vent weaning	24 (17.0)	224 (21.3)	0.23
Cardiac arrest	10 (7.0)	103 (9.8)	0.3
Myocardial Infarction	6 (4.2)	90 (8.5)	0.07
Stroke	2 (1.4)	20 (1.9)	0.68
Bleeding	77 (54.6)	713 (67.8)	p<0.01*
DVT/thrombophlebitis	4 (2.8)	39 (3.7)	0.6
Sepsis	11 (7.8)	108 (10.2)	0.35
Renal Failure	1 (0.7)	11 (1.0)	0.7
Ischemic colitis	8 (5.6)	81 (7.7)	0.38
Repeat rupture of aneurysm	7 (4.9)	61 (5.8)	0.68
Lower Extremity Ischemia	3 (2.1)	50 (4.7)	0.15
Any Morbidity	92 (65.2)	776 (73.8)	p=0.03*
Mortality	24 (17.0)	260 (24.7)	0.04*
Readmission	19 (13.4)	60 (5.7)	p<0.01*
Reoperation	23 (16.3)	151 (14.3)	0.53
Hospital length of stay (SD)	9.78 (12.2)	9.71(15.2)	0.84

Abbreviations: BMI: Body Mass Index, COPD: Chronic Obstructive Pulmonary Disease, CHF: Congestive Heart Failure, HTN: Hypertension, EVAR: Endovascular Aneurysm Repair, GA: General Anesthesia, ASA: American Society of Anesthesiologists Score, DVT: Deep Venous Thrombosis

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DISCLOSURES: K. Bellamkonda: None; N. Nassiri: Terumo Aortic, Medtronic Aortic; M.M. Sadeghi: None; Y. Zhang: None; R. Guzman: None; C.I. Ochoa Chaar: None

9:40 am 26 (RF)

Six-Year Outcomes of the Endologix AFX1 Endovascular AAA System: A Single Center Experience

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

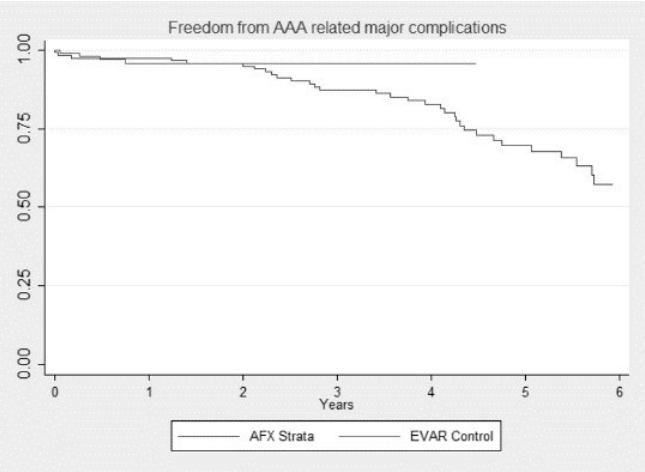
BACKGROUND: Prior publications have documented high rates of delayed endoleaks in the Endologix AFX1 (Strata) grafts. In a safety communication from October 2019, the FDA recommended "benefit-risk determination for each individual patient ... to assess the need for additional procedures related to the risk of developing Type III endoleaks." The goal of this study was to assess long-term outcomes of AFX1 grafts in order to develop more specific recommendations for the follow-up and management of patients with this device.

METHODS: A retrospective review was performed of a single tertiary center experience comparing AFX1 grafts (n=122) to a control cohort (Medtronic, Gore, Cook) (n=101) placed between December 2012 and April 2019. AFX1 was the favored graft in the early experience. The primary study endpoint was freedom from any AAA-related major complication (non-type II endoleak, graft re-lining, or graft explant). Secondary endpoints were 5-year survival, freedom from any endoleak, and freedom from any reintervention. Event rates were calculated by K-M and lifetable analysis.

RESULT: Patient demographics, average AAA diameter, and proportion of elective procedures were comparable between cohorts. Median follow-up was longer for the AFX1 compared to control cohort (4.6 years *vs* 1.8 years, p=0.001). Five-year survival was similar between AFX1 and control (79% *vs.* 71%, p=0.61). The AFX1 cohort had significantly poorer 5-year graft related outcomes: freedom from any endoleak (62% *vs.* 85%, p = 0.006), freedom from reintervention (63% *vs.*87%, p=0.001), and freedom from any AAA-related major complication (69% *vs.* 95%, p=0.001). Most complications in the control group occurred within the first year of placement, while AFX1-related complications increased dramatically past three years and approached 50% at 6-years (Figure).

CONCLUSION: The long-term AAA-related complications are dramatically higher in patients treated with an AFX1 graft. The latency of complications highlights the need for life-long surveillance for all patients treated with EVAR. Additionally, patients treated with an AFX1 graft should be followed very closely and potentially considered for prophylactic relining or explantation. Outcomes of these reinterventions should be further analyzed.

Figure. Freedom from AAA Related Major Complications



DISCLOSURES: T.M. Ta: None; N.J. Aranson: None; M.P. Bianco: None; A. Fournier: None; E.A. Blazick: None; K.T. Malka: None; R.E. Hawkins: None; P.H. Bloch: None; B.W. Nolan: None

9:45 am 27 (RF)

Procedure-Associated Costs and Mid-Term Outcomes of Endovascular Zone 0 and Zone 1 Aortic Arch Repair

Jonathan Aaron Barnes, Zachary J. Wanken, Jesse A. Columbo, David P. Kuwayama, Mark F. Fillinger, Bjoern D. Suckow - Dartmouth-Hitchcock Medical Center, Lebanon, NH

INTRODUCTION: Thoracic endovascular aortic repair (TEVAR) of proximal aortic arch pathology provides a less-invasive treatment option for high-risk patients ineligible for open arch reconstruction. However, the fiscal impact of these techniques remains unclear. Therefore, our objective was to characterize the mid-term outcomes after Zone 0 and Zone 1 TEVAR and describe the associated technical costs, revenues, and net margins at a single tertiary medical center.

METHODS: We examined all patients who underwent TEVAR between April 2011 and August 2019 via retrospective chart review. Patients were categorized by proximal endograft extent to identify Zone 0 or Zone 1 repairs. Procedural characteristics and outcomes were described. Technical costs, revenues, and margins were obtained from the hospital finance department.

RESULTS: We identified 10 patients (6 Zone 0, 4 Zone 1) who were denied open arch reconstruction. Patients were predominantly female (n=8; 80%) and the mean age was 72.8±5.5 years. Repair was performed in 5 asymptomatic patients, urgently in 3 symptomatic patients, and emergently in 2 ruptured patients. Aortic pathology and procedural details are described in table 1. Great vessel debranching with chimney stent-grafting was performed in 4 patients, debranching with branched thoracic endografting in 1 patient (IDE clinical trial), and traditional surgical debranching alone in 4 patients. In-situ fenestration was performed in 1 patient. Within the 30-day postoperative period, 1 patient experienced stroke and 1 patient died. Bypass and branch vessel patency were 100% through the duration of follow-up (mean 19.3 months). Mean total technical cost associated with all procedures or repair stages was $105,164±$59,338 while mean net

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technical margin was -$25,055±$18,746. The net technical margin was negative for 9 patients.

CONCLUSIONS: Endovascular repair of the proximal aortic arch is associated with good mid-term outcomes in patients considered too high-risk for open repair. However, reimbursement does not adequately cover treatment cost, with net technical margins being negative in nearly all cases. To remain financially sustainable, efforts should be made to both optimize aortic arch TEVAR delivery as well as advocate for reimbursement commensurate with associated costs.

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Table. Procedural Details, Outcome Measures and Associated Technical Costs and Net Technical Margins for Zone 0 (n=6) and Zone 1 (n=4) TEVAR

Patient	Indication for Repair	Proximal Extent of Cover-age	Great Vessel Reconstruction	Number of Procedures/ Stages	Stroke or Death	Bypass/ Branch Patency	Survival	Technical Cost (USD)	Net Tech-nical Margin (USD)
1	Ruptured aneurysm	Zone 1	Carotid-carotid bypass, LSA embolization	1	No	100%	Alive at 31 months; follow-up on-going	N/A	N/A
2	Asymptomatic aneurysm	Zone 0	Carotid-carotid bypass, LSA to L carotid trans-position, Gore TSSB branched device to innominate artery	3	No	100%	Died of MI 15 months after repair	$141,688	-$29,549
3	Type IA endoleak after Zone 2 TEVAR for acute type B dissection	Zone 0	Carotid-carotid bypass, carotid-LSA transposi-tion, innominate chimney	2	Death	---	Died in the hospital 4 days after TEVAR	$153,668	-$45,598
4	Asymptomatic aneurysm	Zone 1	LSA to carotid transposition, LCCA chimney	2	No	100%	Alive at 37 months; follow-up on-going	$115,223	-$31,748
5	Symptomatic aneurysm	Zone 0	Carotid-carotid-LSA bypass, innominate chimney, LSA embolization	2	Stroke	100%	Died 18 months after repair	$101,317	-$20,928
6	Ruptured dissection	Zone 0	Carotid-carotid bypass, chim-ney to innomi-nate, snorkel to LSA	2	No	100%	Alive at 34 months; follow-up on-going	$185,613	-$54622
7	Asymptomatic aneurysm	Zone 0	L carotid to R carotid transpo-sition, L carotid to LSA bypass, LSA emboliza-tion	2	No	100%	Alive at 23 months; follow-up on-going	$97,579	-$18,887

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8	Chronic type B dissection with asymptomatic aneurysm	Zone 1	Carotid-carotid-LSA bypass	2	No	100%	Alive at 2 months; follow-up on-going	$48,068	-$26,280
9	Penetrating aortic ulcer	Zone 0	Carotid-carotid-LSA bypass at OSH	2 (debranching at OSH)	No	100%	Died 6 months after repair of un-known causes	$42,813	$4,902
10	Chronic type B dissection with asymptomatic aneurysm	Zone 1	Left carotid and LSA in situ branched fenes-trations	1	No	100%	Alive at 8 months; follow-up on-going	$60,505	-$2,784

USD, United States dollars; LSA, left subclavian artery; TSSB, thoracic single side branch; MI, myocardial infarction; CCA, common carotid artery; OSH, outside hospital

DISCLOSURES: J.A. Barnes: None; Z.J. Wanken: None; J.A. Columbo: None; D.P. Kuwayama: None; M.F. Fillinger: None; B.D. Suckow: None

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9:50 am

28 (RF)

Patients Undergoing Interventions for Intermittent Claudication in States that Increased Cigarette Tax are Less Likely to Actively Smoke

Scott R. Levin[1], Summer S. Hawkins[2], Alik Farber[1], Philip P. Goodney[3], Nicholas H. Osborne[4], Tze-Woei Tan[5], Jeffrey J. Siracuse[1] - [1]Boston University School of Medicine, Boston, MA; [2]Boston College, Chestnut Hill, MA; [3]Dartmouth-Hitchcock Medical Center, Lebanon, NH; [4]University of Michigan, Ann Arbor, MI; [5]University of Arizona, Tucson, AZ

INTRODUCTION AND OBJECTIVES: Active smoking among patients undergoing interventions for intermittent claudication (IC) is associated with poor outcomes. However, contemporary rates of active smoking in these patients are high. State-level tobacco control policies reduce smoking in the general U.S. population. We evaluated whether state cigarette taxes and 100% smoke-free workplace legislation impact active smoking among patients undergoing interventions for IC.

METHODS: We queried the Vascular Quality Initiative database for peripheral endovascular interventions, infrainguinal bypasses, and suprainguinal bypasses for IC. Active smoking was defined as smoking within one month of intervention. We used difference-in-differences, a causal inference technique that adjusts for secular time trends, to isolate changes in active smoking due to state cigarette taxes (adjusted for inflation) and implementation of smoke-free workplace legislation. Models controlled for age, gender, race/ethnicity, insurance type, chronic obstructive pulmonary disease, diabetes, state, and year. We tested interactions of taxes with age and insurance.

RESULTS: Data were available for 59,847 patients undergoing interventions for IC in 25 states from 2011-2019. Across the study period, active smoking decreased from 48% to 40%. Every $1.00 cigarette tax increase was associated with a 6-percentage point decrease in active smoking (95% CI -10 to -1 percentage points, P=.02), representing an 11% relative reduction from baseline in the proportion of patients actively smoking. There were significant interactions by age and insurance. Among patients aged 60-69 and 70-79 years, every $1.00 tax increase resulted in 14% and 21% relative reductions in active smoking compared to baseline subgroup prevalences of 53% and 29%, respectively (P<.05 for all); however, younger age groups were not affected by tax increases. Among insurance groups, only patients on Medicare exhibited a significant change in active smoking with every $1.00 tax increase (18% relative reduction compared to a 33% baseline prevalence, P=.01). States implementing smoke-free workplace legislation increased from 9 to 14 by 2019, but implementation of the policy was not associated with changes in active smoking prevalence.

CONCLUSIONS: Cigarette tax increases appear to be an effective strategy to reduce active smoking among patients undergoing interventions for IC. Older patients and Medicare recipients are most affected by tax increases.

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10:00 am

INDUSTRY SPONSORED SYMPOSIUM #5 (Live)

Unconscious Bias

Jean Starr, MD, Naiem Nassiri, MD & Elizabeth Blazick, MD

Presented by: Medtronic

10:30 am

AWARD ANNOUNCEMENT

- Deterling Award Winner
- Darling Award Winner

10:35 am

CLOSING REMARKS FROM INCOMING PRESIDENT

Alan Dardik, MD, PhD
Yale University School of Medicine
New Haven, CT

10:45 am

Adjourn