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EDITORIALS

775 **Publish and flourish**
Peter Gloviczki, MD, and Peter F. Lawrence, MD

777 **Society for Vascular Surgery Document Oversight Committee and Vascular Quality Initiative working together to improve patient care**
Jens Eldrup-Jorgensen, MD, Fred Weaver, MD, and Ruth Bush, MD, Portland, Me; Los Angeles, Calif; and Houston, Tex

SOCIETY FOR VASCULAR SURGERY DOCUMENT

779 **Clinical competence statement of the Society for Vascular Surgery on training and credentialing for transcarotid artery revascularization**
Brajesh K. Lal, (Chair) MD, William Jordan, MD, Vikram S. Kashyap, MD, Christopher J. Kwolek, MD, Wesley S. Moore, MD, Dipankar Mukherjee, MD, and Marc L. Schermerhorn, MD, Baltimore, Md; Birmingham, Ala; Cleveland, Ohio; Boston, Mass; Los Angeles, Calif; and Falls Church, Va

COVID-19 AND VASCULAR DISEASE

790 **Evaluation and treatment of thoracic outlet syndrome during the global pandemic due to SARS-CoV-2 and COVID-19**
J. Westley Ohman, MD, Stephen J. Annest, MD, Ali Azizzadeh, MD, Bryan M. Burt, MD, Francis J. Caputo, MD, Colin Chan, MB, BS, FRCS, Dean M. Donahue, MD, Julie A. Freischlag, MD, Hugh A. Gelabert, MD, Misty D. Humphries, MD, Karl A. Illig, MD, Jason T. Lee, MD, Ying Wei Lum, MD, Richard D. Meyer, MD, Gregory J. Pearl, MD, Erin F. Ransom, MD, Richard J. Sanders, MD, Joep A. W. Teijink, MD, Patrick S. Vaccaro, MD, Marc R. H. M. van Sambeek, MD, Chandu Vemuri, MD, and Robert W. Thompson, MD, St. Louis, Mo; Denver and Aurora, Colo; Los Angeles, Sacramento, and Stanford, Calif; Houston and Dallas, Tex; Cleveland and Columbus, Ohio; Chester, United Kingdom; Boston, Mass; Winston-Salem, NC; Orangeburg, SC; Baltimore, Md; Birmingham, Ala; Eindhoven and Maastricht, The Netherlands; and Ann Arbor, Mich

799 **The need to manage the risk of thromboembolism in COVID-19 patients**
Inayat Hussain Khan, BSc (Hons), Sugeevan Savarimuthu, MD, Marco Shiu Tsun Leung, BMedSc, MPH, and Amer Harky, MBChB, MRCS, MSc, London, Chelmsford, and Liverpool, United Kingdom

Cover Image: See Vascular Images, page 1098
CLINICAL RESEARCH STUDIES

AORTIC ARCH DISEASE

805 Off-the-shelf multibranched endograft for total endovascular repair of the aortic arch
Côme Bosse, MD, Tilo Kölbl, MD, PhD, Justine Mougin, MD, Jarin Kratzberg, PhD, Dominique Fabre, MD, PhD, and Stéphan Haulon, MD, PhD, Le Plessis-Robinson, France; Hamburg, Germany; and Bloomington, Ind

This retrospective study analyzed anonymized data from the Cook Planning Center of 286 two-branch aortic arch endografts, custom-made between 2013 and 2018. The study suggests that total endovascular repair of arch acute cases is possible with off-the-shelf standardized branched endografts.

812 Invited Commentary
Timothy A. M. Chuter, MD, San Francisco, Calif

Clinical outcomes of aortic arch hybrid repair in a real-world single-center experience
Tony R. Soares, MD, Ryan Melo, MD, Pedro Amorim, MD, Augusto Ministro, MD, PhD, Gonçalo Sobrinho, MD, Luis Silvestre, MD, Ruy Fernandes e Fernandes, MD, Carlos Martins, MD, José Fernandes e Fernandes, MD, PhD, and Luís Mendes Pedro, MD, PhD, Lisbon, Portugal

Increased age and proximal landing zones were independent predictors of overall mortality in this retrospective study of 35 patients submitted to aortic arch debranching and thoracic endovascular repair. Hybrid aortic arch repair was a valid alternative to open surgery, but a careful selection of patients must be considered on the basis of these findings.

THORACOABDOMINAL AND COMPLEX AORTIC ANEURYSMS

822 Outcomes of endovascular repair of chronic postdissection compared with degenerative thoracoabdominal aortic aneurysms using fenestrated-branched stent grafts
Emanuel R. Tenorio, MD, PhD, Gustavo S. Oderich, MD, Mark A. Farber, MD, Darren B. Schneider, MD, Carlos H. Timaran, MD, Andres Schanzer, MD, Adam W. Beck, MD, Fernando Motta, MD, and Matthew P. Sweet, MD, on behalf of the U.S. Fenestrated and Branched Aortic Research Consortium Investigators, Rochester, Minn; Chapel Hill, NC; New York, NY; Dallas, Tex; Worcester, Mass; Birmingham, Ala; and Seattle, Wash

This retrospective analysis of prospectively maintained databases from seven physician-sponsored investigational device exemption studies compared outcomes of fenestrated and branched endovascular aneurysm repair (F/BEVAR) in 50 postdissection thoracoabdominal aortic aneurysms (TAAAs) with 190 degenerative TAAAs. Despite some differences in demographics, anatomic factors, and stent graft design, F/BEVAR was safe and effective in both groups.

837 Incidence, predictors, and outcomes of spinal cord ischemia in elective complex endovascular aortic repair: An analysis of health insurance claims
Franziska Heidemann, MD, Tilo Kölbl, MD, Jenny Kuchenbecker, MSc, Thea Kreutzburg, MSc, E. Sebastian Debus, MD, Axel Larena-Avellaneda, MD, Mark Dankhoff, MD, and Christian-Alexander Behrendt, MD, Hamburg, Germany

Female sex and cardiac arrhythmias were significantly associated with spinal cord ischemia after fenestrated or branched endovascular aneurysm repair (F/BEVAR) of thoracoabdominal aortic aneurysms in this retrospective multicenter study of 877 patients. The authors suggest a need to further illuminate the value of spinal cord prevention protocols in F/BEVAR.
Editors' Choice
Results of fenestrated and branched endovascular aortic aneurysm repair after failed infrarenal endovascular aortic aneurysm repair
Andres Schanzer, MD, Adam W. Beck, MD, Matthew Eagleton, MD, Mark A. Farber, MD, Gustavo Oderich, MD, Darren Schneider, MD, Matthew P. Sweet, MD, Allison Crawford, BS, and Carlos Timaran, MD, on behalf of the U.S. Multicenter Fenestrated/Branched Aortic Research Consortium, Worcester and Boston, Mass; Birmingham, Ala; Chapel Hill, NC; Rochester, Minn; New York, NY; Seattle, Wash; and Dallas, Tex

Prospectively collected data of 893 patients who underwent fenestrated-branched endovascular aneurysm repair (F/BEVAR), including 161 (18%) after failed endovascular aneurysm repair (EVAR) and 732 (82%) without prior EVAR, were analyzed. Although it is technically more challenging, this study confirms the feasibility and safety of F/BEVAR after failed EVAR.

Outcomes of bridging stent grafts in fenestrated and branched endovascular aortic repair
Giovanni Federico Torsello, MD, Efthymios Beropoulis, MD, Roberta Munaò, MD, Santi Trimarchi, MD, Giovanni B. Torsello, MD, and Martin Austermann, MD, Berlin and Münster, Germany; and Milan, Italy

In this retrospective analysis of prospectively collected data of 50 patients, fenestrated and branched endovascular aortic repair using a range of stent grafts as bridging devices resulted in 98.6% technical success and an 80% clinical success at 6 months, with one unrelated death, three major adverse clinical events, and six bridging stent graft-related reinterventions.

Secondary interventions after fenestrated and branched endovascular repair of complex aortic aneurysms
Daniel Silverberg, MD, Ahmad Aburamileh, MD, Uri Rimon, MD, Daniel Raskin, MD, Boris Khaitovich, MD, and Moshe Halak, MD, Tel Aviv, Israel

This retrospective study analyzed secondary interventions after 47 fenestrated and branched endovascular aneurysm repairs and suggests that most reinterventions are due to endoleaks, which can be treated with endovascular methods.

Invited Commentary — Seal zone also matters for branches
Fred A. Weaver, MD, MMM, and Sukgu M. Han, MD, MS, Los Angeles, Calif

ABDOMINAL AORTIC AND ILIAC ARTERY ANEURYSMS

Vascular Quality Initiative assessment of compliance with Society for Vascular Surgery clinical practice guidelines on the care of patients with abdominal aortic aneurysm
Jens Eldrup-Jorgensen, MD, Larry W. Kraiss, MD, Elliot L. Chaikof, MD, PhD, Dan Neal, MS, and Thomas L. Forbes, MD, Portland, Me; Salt Lake City, Utah; Boston, Mass; Chicago, Ill; and Toronto, Ontario, Canada

The Vascular Quality Initiative (VQI) registry was used to measure compliance with Society for Vascular Surgery (SVS) abdominal aortic aneurysm guidelines and the impact on outcomes. Although the overall degree of compliance was high, there was significant variation between centers. Compliance with SVS guidelines was associated with improved outcomes and should be encouraged. VQI registry reports provide an objective assessment of performance and compliance with guidelines and may be used for quality improvement efforts.

Index and follow-up costs of endovascular abdominal aortic aneurysm repair from the Endurant Stent Graft System Post Approval Study (ENGAGE PAS)
Chun Li, MD, Sarah E. Deery, MD, MPH, Eric L. Eisenstein, DBA, Zhi Ven Fong, MD, MPH, Kirsten Dansey, MD, Linda Davidson-Ray, MA, Betsy O’Neal, BA, and Marc L. Schermerhorn, MD, FACS, Boston, Mass. and Durham, NC

This retrospective analysis of prospectively collected data from the Endurant Stent Graft System Post Approval Study revealed that costs associated with index endovascular aortic aneurysm repair, performed with the Medtronic Endurant stent graft system (Medtronic Vascular, Santa Rosa, Calif), were driven primarily by the cost of operating room supplies, including grafts. Subsequent readmissions were largely not aneurysm related; however, the cost of aneurysm-related hospitalizations was higher than for non-aneurysm-related admissions.
Overall outcome after endovascular aneurysm repair with a first-generation stent graft (Vanguard): A 20-year single-center experience
Suvi Väärämäki, MD, PhD, Juha Salenius, MD, PhD, Georg Pimenoff, MD, Ilkka Uurto, MD, PhD, and Velipekka Suominen, MD, PhD, Tampere, Finland

This retrospective, single-center study describes 48 patients treated by endovascular aneurysm repair with the Vanguard first-generation stent graft. Most of the graft-related complications were treatable by endovascular means, but this approach led to an extensive number of secondary procedures and exceptionally long and frequent surveillance.

Aspartate transaminase to platelet ratio index and Model for End-Stage Liver Disease scores are associated with morbidity and mortality after endovascular aneurysm repair among patients with liver dysfunction
Sara L. Zettervall, MD, MPH, Kirsten Dansey, MD, Nicholas J. Swerdlow, MD, Peter Soden, MD, Amy Evenson, MD, and Marc L. Schermerhorn, MD, Boston, Mass

In this analysis of 18,484 National Surgical Quality Improvement Program patients undergoing endovascular aneurysm repair, those with liver fibrosis had increased perioperative morbidity (7.4%) and mortality (2.4%), and these outcomes worsened with increasing Model for End-Stage Liver Disease and aspartate transaminase to platelet ratio index scores. The authors suggest consideration of a larger size criterion for elective repair of abdominal aortic aneurysms in patients with liver fibrosis.

Early and long-term results of open repair of inflammatory abdominal aortic aneurysms: Comparison with a propensity score-matched cohort
Slobodan Cvetkovic, PhD, Igor Koncar, PhD, Stefan Dusic, Petar Zlatanovic, Perica Mutavidzic, Dejan Maksimovic, Biljana Kukic, Dragan Markovic, PhD, and Lazar Davidovic, PhD, Belgrade and Sabac, Serbia

This retrospective, single-center cohort study with prospectively collected data compared early and long-term results of patients with inflammatory abdominal aortic aneurysm (AAA) and matched cohort of patients with plain AAA in an institutional registry for AAA. Open repair of inflammatory AAA carries a high perioperative and long-term risk of graft infection even in high-volume centers. The main causes of complications are intraoperative injury of adjacent organs, bleeding, and coronary events.

Proper technical procedures improved outcomes in a retrospective analysis of EVAS FORWARD IDE trial 3-year results
Jeffrey P. Carpenter, MD, John S. Lane III, MD, Jose Trani, MD, Sajjad Hussain, MD, Christopher Healey, MD, Homayoun Hashemi, MD, and Robert Cuff, MD, for the Nellix Investigators, Camden, NJ; San Diego, Calif; Indianapolis, Ind; Portland, Me; Fairfax, Va; and Grand Rapids, Mich

In this retrospective study of prospectively collected data from the EVAS FORWARD IDE trial, we found the lack of acquired proximal or distal seal (<10 mm) and low or misaligned stent placement to be procedural predictors of Nellix device-related complications. These results indicate that the success of endovascular aneurysm sealing (EVAS) for abdominal aortic aneurysm treatment depends on both anatomic features of the treated aneurysm and adequacy of the technical performance of the EVAS procedure.

The impact of age on in-hospital outcomes after transcarotid artery revascularization, transfemoral carotid artery stenting, and carotid endarterectomy
Hanaa Dakour-Aridi, MD, Vikram S. Kashyap, MD, Grace J. Wang, MD, Jens Eldrup-Jorgensen, MD, Marc L. Schermerhorn, MD, and Mahmoud B. Malas, MD, MHS, RPVI, FACS, La Jolla, Calif; Cleveland, Ohio; Philadelphia, Pa; Portland, Me; and Boston, Mass

This Vascular Quality Initiative study suggests that transcarotid artery revascularization (TCAR) is a safe, minimally invasive alternative to transfemoral carotid artery stenting (TFCAS) in elderly patients who are at high surgical risk. The advantages of TCAR become more pronounced in elderly patients, with significant reductions in in-hospital stroke compared with TFCAS independent of symptomatic status and other medical comorbidities.
Incidence of and risk factors for postoperative urinary retention in men after carotid endarterectomy

Laura T. Boitano, MD, MPH, Madeline DeBono, Adam Tanious, MD, MMSc, James C. Iannuzzi, MD, MPH, W. Darrin Clouse, MD, Matthew J. Eagleton, MD, Glenn M. LaMuraglia, MD, and Mark F. Conrad, MD, MMSc, Boston, Mass; and San Francisco, Calif

In this retrospective study, 28.2% of 294 men who underwent carotid endarterectomy had postoperative urinary retention (POUR). POUR was associated with postoperative urinary tract infection, delay of discharge to facility other than home, and longer length of stay. Preoperative Foley catheterization was protective and should be considered in older patients, diabetics, patients with peripheral artery disease, and those with a history of urinary retention.

Peak systolic velocity and color aliasing are important in the development of duplex ultrasound criteria for external carotid artery stenosis

Matthew D. Kronick, MD, Atish Chopra, MD, Shivam Swamy, BS, Varneet Brar, BS, Enjae Jung, MD, Cherrie Z. Abraham, MD, Timothy K. Liem, MD, Gregory J. Landry, MD, and Gregory L. Moneta, MD, Portland, Ore

This retrospective study showed that a peak systolic velocity (PSV) $\geq 125$ cm/s alone probably overestimates the prevalence of $>50\%$ external carotid artery (ECA) stenosis. A PSV $\geq 200$ cm/s combined with color aliasing was highly predictive of $>50\%$ ECA stenosis based on correlation with computed tomography angiography.

Invited Commentary — How much should we know about the external carotid artery?

Ravi R. Rajani, MD, Atlanta, Ga

Surgical repair of radiation-induced carotid stenosis

Régis Renard, MD, Jean-Michel Davaine, MD, PhD, Thibault Couture, MD, Jérémie Jayet, MD, Philippe Tresson, MD, Julien Gaudric, MD, Laurent Chiche, MD, PhD, and Fabien Koskas, MD, PhD, Paris, France

Carotid endarterectomy of 162 lesions in 128 patients for radiation-induced carotid stenosis was performed with 1.5% postoperative deaths and a 2.5% rate of cerebrovascular events. Seven patients had permanent cranial nerve injury. The 3-year primary patency was 96% with a freedom from neurologic event of 98%.

Paclitaxel-coated peripheral artery devices are not associated with increased mortality

Norman H. Kumins, MD, Alexander H. King, MS, Ravi N. Ambani, MD, MBA, Jones P. Thomas, MD, Saideep Bose, MD, MPH, Mehdi H. Shishehbor, DO, Jun Li, MD, Virginia L. Wong, MD, Karem C. Harth, MD, MPH, Jae S. Cho, MD, and Vikram S. Kashyap, MD, Cleveland, Ohio

A retrospective, single-institution review of 1170 consecutive patients who underwent femoropopliteal percutaneous revascularization shows that paclitaxel-coated devices did not increase mortality compared with uncoated devices out to 3.5 years. This holds true regardless of sex and presence of diabetes, chronic kidney disease, or chronic limb-threatening ischemia.

Rapid increase in hybrid surgery for the treatment of peripheral artery disease in the Vascular Quality Initiative database

Arash Fereydooni, MS, Bin Zhou, MPH, Yunshan Xu, MPH, Yanhong Deng, MPH, Alan Dardik, MD, PhD, and Cassius Lyad Ochoa Chaaar, MD, MS, FACS, New Haven, Conn

Retrospective analysis of Vascular Quality Initiative database showed hybrid lower extremity revascularization for peripheral artery disease is increasingly used. Hybrid femoropopliteal revascularization improves perioperative outcomes compared with femoropopliteal bypass; however, both procedures have comparable 1-year outcomes, suggesting hybrid femoropopliteal revascularization should be performed selectively in high-risk patients owing to its better short-term outcomes.
Poor glycemic control is associated with significant increase in major limb amputation and adverse events in the 30-day postoperative period after infrainguinal bypass

Katharine L. McGinigle, MD, MPH, Daniel C. Kindell, MD, Paula D. Strassle, PhD, MSPH, Jason R. Crowner, MD, Luigi Pascarella, MD, Mark A. Farber, MD, William A. Marston, MD, Shipra Arya, MD, and Corey A. Kalbaugh, PhD, MS, Chapel Hill, NC; Palo Alto, Calif; and Clemson, SC

In this Vascular Quality Initiative study of 30,813 patients undergoing infrainguinal bypass, each increase in severity category from nondiabetic to well-managed diabetic to uncontrolled diabetic (hemoglobin A1c level of 7%-10% and then >10%) was associated with a 29% increase in odds of major adverse cardiac events and an 8% increase in odds of major adverse limb events. Attention to diabetes as a modifiable preoperative risk factor is likely to improve surgical outcomes.

Clinical aspects and present challenges of the seat belt aorta

Ryan Gouveia e Melo, MD, Pedro Amorim, MD, Tony Ramos Soares, MD, Ruy Fernandes e Fernandes, MD, Augusto Ministro, MD, PhD, Pedro Carrido, MD, José Fernandes e Fernandes, MD, PhD, and Luís Mendes Pedro, MD, PhD, Lisbon, Portugal

After a car accident, the presence of a seat belt sign or lower limb ischemia must lead to a high diagnostic suspicion of seat belt aorta. In-hospital mortality for patients presenting acutely was 38%. Management in nine patients took into account other concomitant injuries. Follow-up is crucial as most patients are young; they may develop complications and require further intervention.

Investigating uncommon vascular diseases using the Vascular Low Frequency Disease Consortium

Peter F. Lawrence, MD, Donald T. Baril, MD, and Karen Woo, MD, MS, Los Angeles, Calif

The Vascular Low Frequency Disease Consortium is a multi-institutional platform that provides high-volume standardized data that either confirms or changes prior management principles for uncommon diseases with limited available data.

The effect of rurality on the risk of primary amputation is amplified by race

Samantha Danielle Minc, MD, MPH, Philip P. Goodney, MD, MS, Ranjita Misra, PhD, Dylan Thibault, MS, Gordon Stephen Smith, MB, ChB, MPH, and Luke Marone, MD, Morgantown, WV, and Lebanon, NH

This retrospective review of Vascular Quality Initiative amputation data found that in 3332 patients who underwent primary amputation, rurality was associated with greater odds for primary amputation in nonwhite patients but not in white patients. The effect of race was significant in both urban and rural settings; however, it was significantly stronger in rural settings. Strategies to improve health of rural communities should consider the needs of nonwhite residents to reduce disparities.

Patterns of opioid use in dialysis access procedures

Kevin C. Janek, MD, Kyla M. Bennett, MD, Joseph R. Imbus, MD, Juan S. Danobeitia, MD, PhD, Jennifer L. Philip, MD, and David M. Melnick, MD, Madison, Wis

This single-center, retrospective study characterized postoperative opioid use after common dialysis access procedures. The authors suggest that most patients use few pills for a limited time and advocate for conservative prescription practices.
VASCULAR IMAGING

1025 Magnetic resonance imaging assessment of proteolytic enzyme concentrations and biologic properties of intraluminal thrombus in abdominal aortic aneurysms
Milos Sladojevic, MD, Zeljka Stanojevic, MD, PhD, Igor Koncar, MD, PhD, Petar Zlatanovic, MD, Sasenka Vidicic, MD, Jelena Tosić, MD, Aleksandra Isakovic, MD, PhD, Miroslav Markovic, MD, PhD, and Lazar Davidovic, MD, PhD, Belgrade, Serbia

In 50 patients with abdominal aortic aneurysm, a positive correlation was found between thrombus signal intensity on contrast-enhanced magnetic resonance imaging (MRI) and neutrophil elastase concentration in the thrombus. There was a negative correlation with the elastin content of the aneurysm wall. MRI may predict thrombus proteolytic enzyme concentrations and extracellular matrix content of the aneurysm wall, thus providing additional information on aneurysm rupture risk.

1035 Quantitative evaluation of postintervention foot blood supply in patients with peripheral artery disease by computed tomography perfusion
Ming Li, PhD, Zheng Li, MD, Pan Gao, MD, Liang Jin, MD, Li Li, MD, Wei Zhao, PhD, Wan Zhang, PhD, Yingli Sun, MD, Yun Zhao, MD, and Jiasen Cui, PhD, Shanghai, China

This prospective, single-center study analyzed the computed tomography (CT) perfusion parameters (before and after intervention) of the limbs on the treated and untreated sides of 19 patients with peripheral artery disease. The reported results revealed the potential value of CT perfusion for quantifying foot blood supply.

COMPLICATIONS IN ENDOVASCULAR INTERVENTIONS

1043 Multicenter experience in translumbar type II endoleak treatment in the hybrid room with needle trajectory planning and fusion guidance
Robert Rhee, MD, Gustavo Oderich, MD, Adriene Hertault, MD, Emmanuel Tenorio, MD, Michael Shih, MD, Sara Honari, MD, Theresa Jacob, PhD, MPH, and Stephan Haulon, MD, Brooklyn, NY; Rochester, Minn; and Lille and Le Plessis-Robinson, France

This is a retrospective, multicenter study of 26 patients with type II endoleaks (T2Ls) after standard endovascular aneurysm repair (EVAR) or fenestrated-branched EVAR who were treated using a novel needle trajectory planning and guidance software program in a hybrid operating room. This approach was reproducible, safe, and effective for treatment of T2Ls.

VASCULAR INFECTIONS

1050 Outcome of rectus femoris muscle flaps for groin coverage after vascular surgery
Lina F. Wübbeke, MD, Jurek Z. M. Conings, MD, Jan-Willem Elshof, MD, Marc R. Scheltinga, MD, PhD, Jan-Willem H. C. Daemen, MD, PhD, Michael J. Jacobs, MD, PhD, and Barend M. Mees, MD, PhD, Maastricht, Venlo, and Veldhoven, The Netherlands; and Aachen, Germany

This multicenter, retrospective cohort study analyzed the outcomes of 96 rectus femoris muscle flaps (RFFs) for deep groin wound complications after vascular surgery and compared them with 30 sartorius muscle flaps (SMFs). The study demonstrated that RFF coverage by vascular surgeons is an effective way to manage complex groin wound infections, achieving similarly good results as the SMF.

1058 Invited Commentary — Vascular surgeons should learn how to perform rectus femoris muscle flaps
Keith D. Calligaro, MD, Philadelphia, Pa

VASCULAR REPAIR DURING GYNECOLOGIC OPERATIONS

1059 Vascular repairs in gynecologic operations are uncommon but predict major morbidity and mortality
Scott R. Levin, MD, Susanna W. L. de Geus, MD, PhD, Nyia L. Noel, MD, MPH, Michael K. Paasche-Orlow, MD, MA, MPH, Alik Farber, MD, and Jeffrey J. Siracuse, MD, Boston, Mass

In this retrospective analysis of 201,224 gynecologic operations, <0.1% required vascular repairs. Vascular repairs independently predicted major morbidity and mortality, underscoring the need for risk assessment and informed consent.

1067 Invited Commentary — Paging vascular surgery on-call
Ravi R. Rajani, MD, Atlanta, Ga
PRACTICE MANAGEMENT

1068 Medicare reimbursement of lower extremity bypass does not cover cost of care for most patients with critical limb ischemia
Stefana Voicu, MS, Spencer W. Trooboff, MD, MBA, Philip P. Goodney, MD, MS, Robert M. Zwolak, MD, PhD, and Richard J. Powell, MD, Hanover and Lebanon, NH

A Diagnosis-Related Group-based analysis of Medicare reimbursement for lower extremity bypass in patients with critical limb ischemia shows that Diagnosis-Related Group reimbursement does not account for case complexity when compensating vascular surgeons, nor does it cover the cost of care for the majority of patients. More granular risk stratification profiles are needed to ensure open surgical care for patients with critical limb ischemia remains financially sustainable.

1075 Invited Commentary — Are vascular surgeons paying the price for critical limb ischemia care?
Larry W. Kraiss, MD, FACS, DFSVS, Salt Lake City, Utah

EDUCATION CORNER

1076 Development of a pulsatile cadaver-based simulation for training of open abdominal vascular surgery skills
Rumi Faizer, MD, Ashish Singal, PhD, Clarence Ojo, MD, and Amy B. Reed, MD, Minneapolis, Minn

Implementation of a pulsatile cadaver-based simulation model for abdominal vascular surgery has the potential to be both affordable and provide necessary haptics and fidelity for training fellows in critical abdominal vascular techniques.

FROM BENCH TO BEDSIDE

1087 Ex vivo expansion of regulatory T cells from abdominal aortic aneurysm patients inhibits aneurysm in humanized murine model
Melissa K. Suh, MD, Rishi Batra, MD, Jeffrey S. Carson, MD, Wanfen Xiong, MD, PhD, Matthew A. Dale, MD, PhD, Trevor Meisinger, BS, Cameron Killen, MD, John Mitchell, MD, and B. Timothy Baxter, MD, Omaha, Neb

This study using a murine model of abdominal aortic aneurysm (AAA) demonstrated the human CD4+ T cells were able to drive aneurysm formation. Ex vivo augmentation of human regulatory T cells attenuated AAA progression.

1097 Invited Commentary — Recognizing the evolving and beneficial role of regulatory T cells in aneurysm growth
Frank M. Davis, MD, and Andrea T. Obi, MD, Ann Arbor, Mich

VASCULAR IMAGES

1098 Gigantic aneurysm after endovascular aneurysm repair due to lack of mandatory surveillance
Nicolas J. Mouawad, MD, MPH, MBA, FSVS, FRCS, FACS, RPVI, Bay City, Mich

REVIEW ARTICLES

1100 Time trends of international English language publication activity by vascular surgeons
E. Sebastian Debus, MD, PhD, Dario L. Hinrichs, MD, and Reinhart T. Grundmann, MD, PhD, Hamburg, Germany

1109 A meta-analysis of combined proximal stent grafting with or without adjunctive distal bare stent for the management of aortic dissection
Peng Qiu, MD, PhD, Binshan Zha, MD, Xu Zhang, PhD, Kaichuang Ye, MD, PhD, Jinho Qin, MD, PhD, Xinrui Yang, MD, PhD, Zhiyou Peng, MD, PhD, Junchao Liu, MD, PhD, and Xinwu Lu, MD, PhD, Shanghai and Hefei, China

1121 Invited Commentary — Is a “petticoat” just cosmetic or like a “belt and suspenders”?
John F. Eidt, MD, Dallas, Tex
A systematic review and meta-analysis of long-term reintervention after endovascular abdominal aortic aneurysm repair

Zachary J. Wanken, MD, MS, J. Aaron Barnes, MD, Spencer W. Trooboff, MD, MBA, Jesse A. Columbo, MD, MS, Tarun K. Jelia, MPH, Daniel J. Kim, MPH, Arian Khoshgowari, MPH, Natalie B. V. Riblet, MD, MPH, and Philip P. Goodney, MD, MS, Lebanon and Hanover, NH

Systematic review and meta-analysis of postoperative troponin as a predictor of mortality and major adverse cardiac events after vascular surgery

Carla Borg Caruana, MBBS (Hons), BMedsSci, Sarah M. Jackson, BBioMed, Jacqueline Ngyuen Khuong, MD, BBioMed, Ryan Campbell, MBBS, BMedsSci (Hons), Zhengyang Liu, BBioMed, Dhruvesh M. Ramson, MBBS (Hons), BSc, Ned Douglas, MBBS, BMedsSci, FANZCA, Juliana Kok, MBBS, FANZCA, Luke A. Perry, MBBS (Hons), BSc, and Jahan C. Penny-Dimri, MBBS (Hons), BMedsSci (Hons), Parkville and Clayton, Victoria, and Sydney, New South Wales, Australia

The role of vascular surgeons in the treatment of COVID-19-associated pulmonary embolism

Nikolaos Patelis, MD, MSc, PhD, Theodosios Bisdas, MD, PhD, Dimitrios Tsiachris, MD, and Christodoulos I. Stefanadis, MD, PhD, Marousi, Athens, Greece

COVID-19 and SIC (!)

Ilja Nevzorov, PhD, Riikka Tulamo, MD, PhD, Anders Alböck, MD, PhD, and Riitta Lassila, MD, PhD, Helsinki, Finland

A proposed scoring system for triage of patients who require vascular access creation in times of COVID-19

Jun Jie Ng, FRCS, Andrew M. T. L. Choong, FRCS, FEBVS (Hons), and Clara L. Y. Ngoh, MRCP, Singapore

Management and outcomes of a vascular surgery department with sudden medical staff outbreak of COVID-19

António Pereira-Neves, MD, MSc, João Rocha-Neves, MD, MSc, MPH, FEBVS, Alfredo Cerqueira, MD, and José Teixeira, MD, FEBVS, Oporto, Portugal
Acute limb ischemia in COVID-19 patients: Could aortic floating thrombus be the source of embolic complications?
Roberto Silingardi, MD, Stefano Gennai, MD, Mattia Migliari, MD, Tea Covic, MD, and Nicola Leone, MD, Modena, Italy

Statistical determination of clinical outliers and public shaming
John Blebea, MD, MBA, and Robert W. Tahara, MD, Saginaw, Mich; and Bradford, Pa

Reply
Caitlin W. Hicks, MD, MS, and Martin A. Makary, MD, Baltimore, Md

The dilemma of using the Mangled Extremity Severity Score to identify predictors of poor outcomes in extremity vascular trauma
Amila Ratnayake, MS, Miklosh Bala, MD, and Tamara J. Worlton, MD, Colombo, Sri Lanka; Jerusalem, Israel; and Bethesda, Md

Reply
Hunter M. Ray, MD, and Kristofer M. Charlton-Ouw, MD, Houston, Tex